



ICCM22

MELBOURNE AUSTRALIA

11-16 AUGUST 2019

22nd International Conference
on Composite Materials

www.iccm22.com

Conference hosts



ENGINEERS
AUSTRALIA

ICCM



Information is correct at time of
publication and is subject to change.

PROGRAM BOOK



WORLD ENGINEERS CONVENTION

20 – 22 NOVEMBER | MELBOURNE, AUSTRALIA

Over 3-days you will have access to **over 580 presentations** including from internationally recognised speakers:



**Prof.
Carlo Ratti**

Director, Senseable
City Lab, MIT and
Founding Partner,
Carlo Ratti Associati
ITALY



**Meredith
Westafer**

Senior Industrial
Engineer,
Tesla
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WELCOME MESSAGE

WELCOME TO MELBOURNE, AUSTRALIA AND THE 22ND INTERNATIONAL CONFERENCE ON COMPOSITE MATERIALS

We are very proud to be organising ICCM22 and we trust you will have an outstanding experience at the conference and during your stay in Melbourne and Australia.

ICCM22 continues the 44 year history of the International Conferences on Composite Materials, which commenced in 1975. This is the second time an ICCM has been held in Australia, with the first conference (ICCM11) held in Queensland in 1997. ICCM22 is proudly brought to you by the Australian Composites Structures Society, which is a professional society of Engineers Australia.

The theme of ICCM22 is '**Advanced Composites: Research to Impact**' with the overall objective of exploring the latest research into composites and how the materials will be used in the future for applications including aerospace, construction, wind energy and automotive.

The scientific program of ICCM22 contains about 1513 presentations with the authors coming from over 50 countries representing the three ICCM world regions. Delegates from all parts of the composites sector, including universities, research institutions, government agencies, material suppliers, manufacturers and other industry, are attending ICCM22. Such diversity will ensure a vibrant, engaging and multifaceted conference. We are grateful to all authors for their outstanding contributions to the ICCM22 scientific program, which we believe is first rate.

The full ICCM22 program is printed in this book along with helpful information, including the locations of the session rooms in the Melbourne Convention and Exhibition Centre, Exhibition display area, locations for lunch and breaks, and details about the conference sponsors.

The ICCM22 conference proceedings contain the abstract, full paper or PowerPoint slides for presentations. The proceedings also contain the poster for poster presentations. You can easily access the proceedings via the ICCM22 website

(www.iccm.com) or the ICCM22 App. This program booklet is also accessible via the website and App.

We hope you greatly enjoy the many events and technical tours planned throughout ICCM22, all of which are described in this program. Conference updates on events and practical matters will be issued throughout the program via electronic notifications through the website and Conference app. Also remember to check the electronic notice boards in front of each session room for last minute, unavoidable changes to the program. If you need any assistance during the conference then please do not hesitate to contact the ICCM22 secretariat or us for help. Assistants will be present in all session rooms.

We sincerely thank Engineers Australia, MCI, the Local Organising Committee and the International Scientific Committee and student volunteers for their outstanding work; without which the conference would not be possible. Once again, welcome to Melbourne Australia and enjoy ICCM22.

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CONFERENCE CHAIRS



Adrian Mouritz



Chun Wang



Bronwyn Fox



Research Program

Building on our strong collaborations between industry and university partners ATLAS will train urgently needed commercially focused researchers specialising in lightweight multi-material structures obtained through advanced, agile and digital manufacturing technologies.

ATLAS comprises an integrated research program encompassing four themes as outlined below:

LIGHTWEIGHT MATERIALS

Research underpinning the development and efficient processing of high-performance lightweight materials like carbon-fibre composites and highly formable metal alloys for the manufacture of next generation lightweight components and assemblies by Australian manufacturers.

DESIGN AND ADVANCED MANUFACTURING

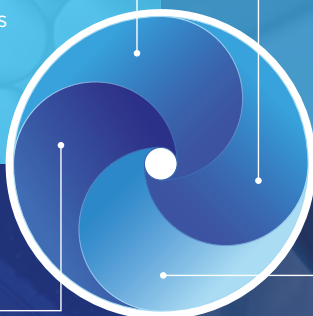
Advancement of agile and digital manufacturing technologies such as additive manufacturing, flexible roll forming technologies and multi-material joining techniques to enable local manufacturers to efficiently produce high value products for local and international markets.

INTEGRATED MULTI-MATERIAL STRUCTURES

Design and demonstration of smart integrated multi-material structures such as those with gradient physical properties for controlled crush or imbedded functional features like the capacity to store electrical energy for future mobility solutions.

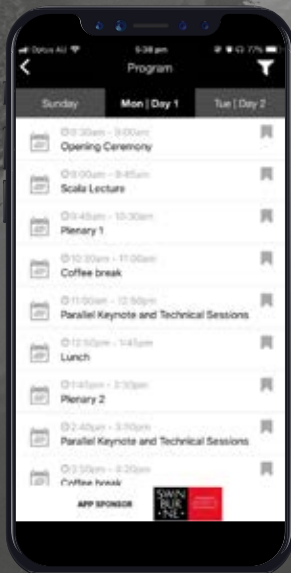
WHOLE OF LIFE ASSESSMENT

Validating the whole of life economic, environmental and societal benefits of next generation lightweight multi-material structures through quantitative life cycle assessments and the development of decision making tools to help guide design choices.



Our Partners





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PROGRAM



EXHIBITORS



VIRTUAL SACHEL



SPEAKERS



TECHNICAL TOURS

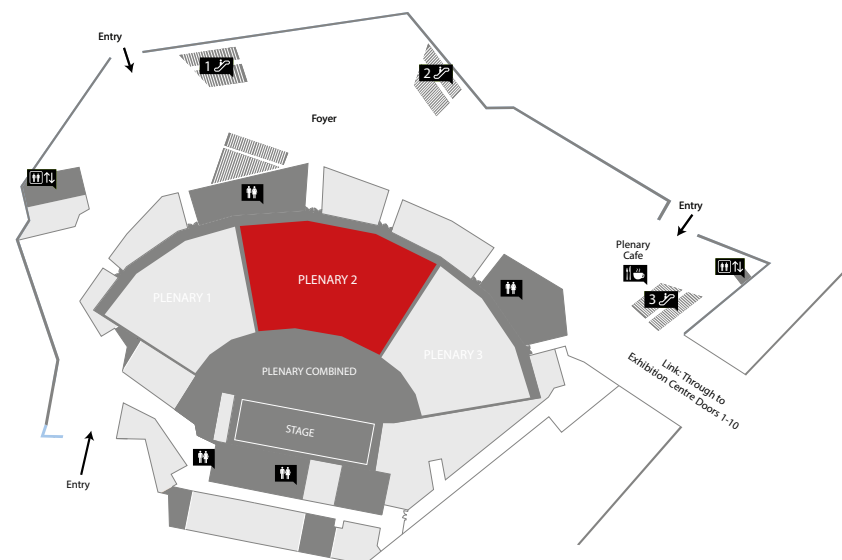


SPONSORS

VENUE OVERVIEW

ICCM22 session rooms are indicated in red

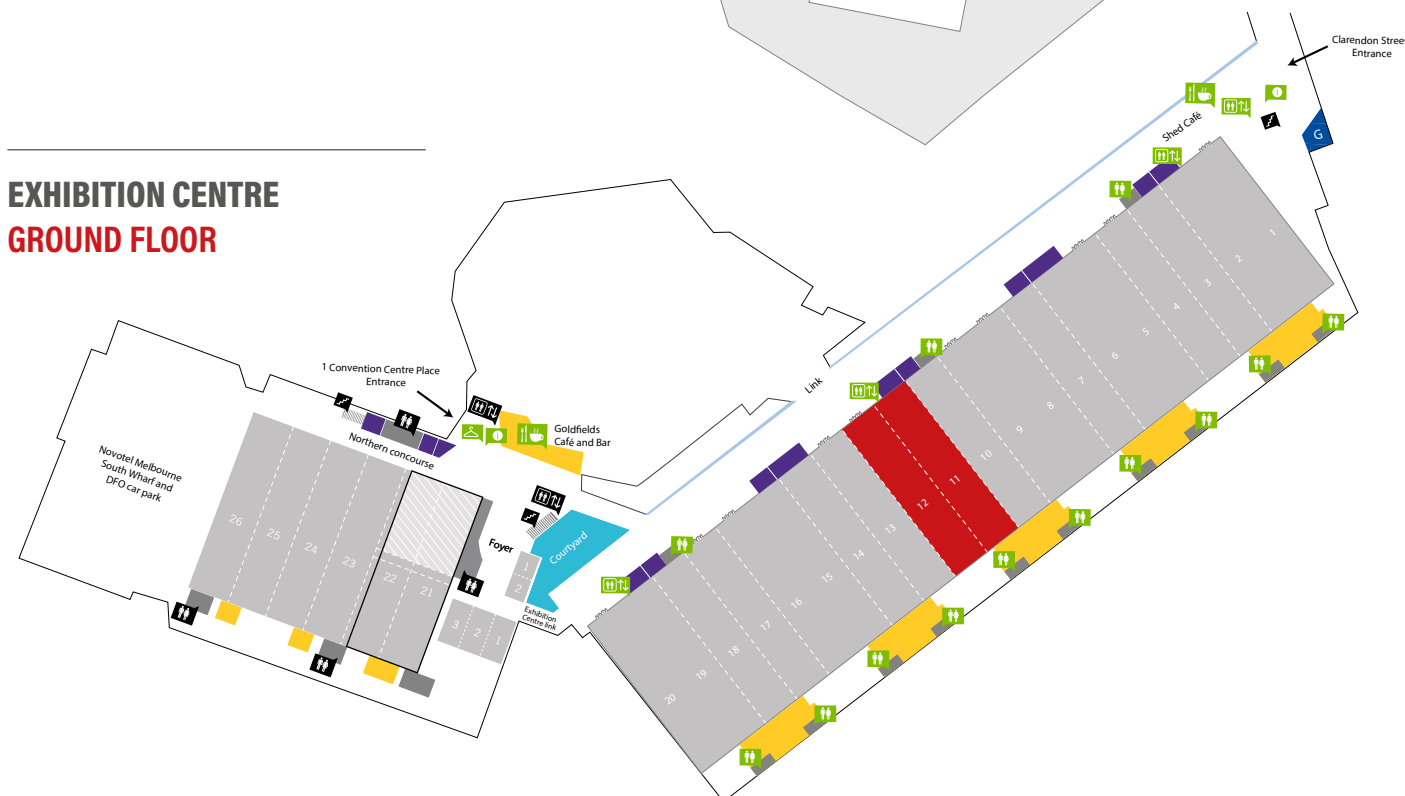
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CONVENTION CENTRE LEVEL TWO



EXHIBITION CENTRE GROUND FLOOR



SKYSCAN 1273 - High-Capacity 3D X-ray Microscopy

The SKYSCAN 1273 is Bruker's latest benchtop 3D X-ray microscope based on micro computed tomography (Micro-CT), a non-destructive imaging technology pioneered by Bruker. The SKYSCAN 1273 sets a new standard for non-destructive testing (NDT) with benchtop instruments, providing a performance previously only achieved by floor standing systems. Samples with up to 500 mm length, 300 mm diameter, and a maximum weight of 20 kg can be inspected. The combination of a higher energy X-ray source running at higher power and a large format flat-panel detector with ultimate sensitivity and readout speed provides excellent image quality in just a few seconds.

Features:

- 40-130kV maintenance-free X-ray source for low cost of ownership
- 8-position automatic filter changer for automatic energy selection
- GPU-acceleration for fast 3D reconstructions
- Offset scanning with automatic stitching of oversized images
- Best image quality of planar structures thanks to helical scanning and exact reconstruction
- Up to 4x faster scanning of objects with high aspect ratio thanks to HART Plus



SPECTRO ARCOS - ICP-OES Analyser

The SPECTRO ARCOS ICP-OES excels in industrial and academic applications for the most advanced elemental analysis of metals, chemicals, petrochemicals, and other materials. Its unique new MultiView plasma interface option provides truly uncompromising axial-view and radial-view plasma observation in a single instrument. Its innovative, exclusive solid-state generator offers the industry's highest power in an energy-efficient, future-proof package.



SPECTRO XEPOS - ED-XRF Spectrometers

The new SPECTRO XEPOS spectrometer represents a quantum leap in energy dispersive X-ray fluorescence technology. It provides breakthrough advances in multi-elemental analysis of major, minor, and trace element concentrations. New developments in excitation and detection deliver outstanding sensitivity and detection limits — yielding remarkable gains in precision and accuracy.



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GENERAL INFORMATION

REGISTRATION DESK OPENING TIMES

The registration desk will be located in the exhibition concourse foyer and will be open during the following times:

DATE	TIME
Sunday 11 August	1400–1800
Monday 12 August	0700–2100
Tuesday 13 August	0700–1830
Wednesday 14 August	0700–1830
Thursday 15 August	0700–1830
Friday 16 August	0700–1530

SPEAKER PREPARATION ROOM

A speaker preparation room is available for all chairpersons and speakers during the conference. This is a room specifically reserved for speakers and chairpersons to work on, load and practice their presentations/chairing duties or simply just to relax and de-stress prior to their program responsibilities.

The speaker preparation room is located in Meeting Room 220 at the Melbourne Convention and Exhibition Centre and will be staffed by professional AV technicians and will be open during the following times:

DATE	TIME
Monday 12 August	0700–1800
Tuesday 13 August	0700–1800
Wednesday 14 August	0700–1600
Thursday 15 August	0700–1800
Friday 16 August	0700–1500

EXHIBITION OPENING TIMES

The ICCM22 exhibition will be in exhibition bays 11/12, accessible via door 6.

DATE	TIME
Monday 12 August	1030–2100
Tuesday 13 August	1000–1830
Wednesday 14 August	1000–1630
Thursday 15 August	1000–1830
Friday 16 August	1000–1530

INTERNET ACCESS

Most Australian hotels offer wired or wireless high-speed internet access in their guest rooms. Most hotels will also have a business centre with available computers and printers for their guests to use.

While onsite at the conference a complimentary wifi service is available to all delegates:

Network Name: ICCM22
Password: Composites

There is no other Business Lounge facility provided at the conference or at the Melbourne Convention and Exhibition Centre.

CATERING AND SPECIAL DIETS

Morning and afternoon tea, as well as lunches are being served for all delegates within the exhibition.

A special diet requirement is when a person chooses to omit certain foods or food groups from their diet on religious, ethical, moral or medical grounds. Provision will be made for food intolerances, halal and kosher requests, as well as vegetarian/vegan requests.

If you have confirmed a special dietary requirement at time of registration, there will be a separate special dietary requirements table available during the catering breaks.

SMOKING

There is no smoking indoors or within enclosed public areas in Melbourne. The Melbourne Convention and Exhibition Centre is also a smoke free environment.

LANGUAGE

The official language of the 22nd International Conference on Composite Materials is English.

INSURANCE

The 22nd International Conference on Composite Materials is unable to accept responsibility for accidents or damage to the private property of participants. Please ensure that you do not leave portable and valuable pieces of equipment unattended anywhere, and that you make your own arrangements for health, travel, general and other insurance.

PROCEEDINGS

All accepted presentations will be included in the official ICCM proceedings. The proceedings will be available to registered ICCM22 delegates via the official website and conference app.

CPD HOURS

Attendance at the 22nd International Conference on Composite Materials entitles you to earn professional development hours from Engineers Australia. We recommend visiting the official conference website, specifically the conference program page for more details.

FIRST AID

The conference will have professional first aid assistance onsite – see staff at the registration desk for information.

EMERGENCY

In an emergency, dial 000 for fire, police, and ambulance. The nearest public hospitals are:

Alfred Hospital
55 Commercial Road, Melbourne
T: +61 3 9076 2000
www.alfredhealth.org.au

Royal Melbourne Hospital
300 Grattan Street, Parkville
T: +61 3 9342 7000
www.thermh.org.au

In case you are not feeling well please find the nearest GP clinics. Fees may apply to any medical treatment.

Freshwater Place Wellness Medical Practice
Suite 13-15/1 Freshwater Place, Southbank VIC 3006
T: +61 3 9926 3646
www.fpwmp.com.au

My Clinic Southbank
63 Power Street, Southbank, 3006
T: +61 3 9131 4210
www.myclinicgroup.com.au/our-clinics/myclinic-southbank

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SOCIAL PROGRAM

WELCOME RECEPTION - MONDAY 12 AUGUST 2019

Time: 1845–2100
Location: Exhibition Bays 11 and 12, Melbourne Convention and Exhibition Centre (MCEC)
Dress Code: Business Casual

Sponsor:



STUDENT PARTY - TUESDAY 13 AUGUST 2019

Time: 1900–2300
Location: Wunderbar – Munich South Wharf
45 South Wharf Promenade, South Wharf VIC 3006
Dress Code: Business Casual
Please make your way to Munich South Wharf or be at the conference registration desk at 1845 to be escorted to the student party venue.

Sponsor:



ICCM22 BANQUET - THURSDAY 15 AUGUST 2019

Time: 1845-2230
Location: Melbourne Room, Melbourne Convention and Exhibition Centre (MCEC)
Dress Code: Semi Formal/ Business "Jacket"

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11

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Melbourne Convention Bureau

With its vibrant culture, multicultural population, temperate climate and outstanding quality of life, Melbourne is an ideal destination for delegates. The city is compact, convenient and easy to navigate inviting you to discover its creative culture through all its elements; from art and fashion, to the sports scene and renowned diverse gastronomy.

The city is home to historical and modern architecture, hidden laneways, beautiful green spaces, art galleries, music venues and a wealth of attractions providing unlimited choices for exploration.

Boasting a myriad of restaurants, bars, hatted dining rooms and coffee shops, Melbourne is a foodie paradise for all visitors and locals alike.

Once your conference day is over, be prepared to feel the city in every corner and on the countless immersive experiences on offer.

For more information and ideas, visit melbourne.org

ICCM22 PARTNER



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W: www.afresearchlab.com

AFOSR

The Air Force Office of Scientific Research (AFOSR) is an integral part of the Air Force Research Laboratory (AFRL).

As its basic research manager, AFOSR provides grants and contracts to universities worldwide, small businesses in the U.S., and various Technology Directorates of AFRL. All support basic research activities with potential applications to the future Air Force. AFOSR is a global organization with branches located in Arlington, Virginia; London, UK; Tokyo, Japan; and Santiago, Chile.

We believe basic research is the foundation of all science and engineering discovery and progress and spawns the inventions and concepts - many of which are revolutionary.

PRINCIPAL PARTNER



BOOTH 17 & 18

Rajneesh Shinde
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W: altair-anz.com

Altair

Altair (Nasdaq: ALTR) is a global technology company that provides software and cloud solutions in the areas of product development, high-performance computing (HPC), and data intelligence. Altair enables organizations across broad industry segments to compete more effectively in a connected world while creating a more sustainable future.

We are a leading provider of enterprise-class engineering software enabling innovation, reduced development times, and lower costs through the entire product lifecycle from concept design to in-service operation.

PRINCIPAL PARTNER



BOOTH 27 & 28

Melanie de Git
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W: boeing.com.au

Boeing

Boeing's presence in Australia is the company's largest footprint outside the United States, with more than 3,000 employees in 38 locations. Boeing has the broadest portfolio in Australian aerospace, with its employees and an extensive supply chain supporting our advanced manufacturing of commercial aircraft composite components, defence systems design and development, modeling and simulation, research and development, support and training, and unmanned systems.

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MSC Software

MSC Software develops simulation software technology that enables engineers to validate and optimize their designs using virtual prototypes. Customers in almost every part of manufacturing use our software to complement, and in some cases even replace the physical prototype "build and test" process that has traditionally been used in product design.

As a trusted partner, MSC Software helps companies improve quality, save time and reduce costs associated with design and test of manufactured products. Our products accurately and reliably predict how products will behave in the real world to help engineers design more innovative products - quickly and cost effectively.

MAJOR PARTNER



BOOTH 20

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W: bristol.ac.uk/composites/

University of Bristol

Bristol in the UK is THE place in the world for composites R&D. Not only is it a hub for industries leading the way in composites adoption it is home to two world-leading composites partners - The National Composites Centre and Bristol Composites Institute (ACCIS).

The NCC is a world-leading authority on composites R&D, bringing together and developing the best minds and technologies, to solve the world's most complex engineering challenges. Bristol Composites Institute (ACCIS) is a world-leading institute for composites research and education that combines cutting-edge fundamental science with strong industrial links for exploitation and technology transfer

ASSOCIATE PARTNER



BOOTH 23

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W: atlas-innovation.com.au

Atlas Innovations

Atlas aims to accelerate the transformation of Australia's automotive industry through new research capabilities in lightweight automotive structures design and manufacture.

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BOOTH 22

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W: carbonnexus.com.au

Deakin University - Carbon Nexus

Carbon Nexus is a globally unique open-access carbon fibre and composite research centre owned and operated by Deakin University. Located at the Geelong Waurn Ponds Campus, Carbon Nexus facilitates world-class innovation in carbon fibre and composite materials, researching all aspects of fibres and composites, scale-up, characterisation, applied analysis and advanced manufacturing concepts. The facility houses an industrial-scale carbon fibre Pilot Line complemented by a Research-Scale Line to enhance research efficiency and flexibility.

ASSOCIATE PARTNER



Harry Baxter
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DMTC Limited

DMTC works collaboratively with many successful and innovative Australian industry, research and government agencies to advance technologies in areas identified as priorities by Defence. Our focus is on delivering enhanced defence and national security capabilities, and strengthening Australian industrial capacity.

Our proven approach delivers outstanding achievements in industrially-relevant research and adoption and commercialisation of technology, underpinned by ISO:9001 accredited business processes.

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Fill Gesellschaft m.b.H

Fill is a family owned company located in Austria. 850 employees are developing, manufacturing high tech production solutions for different markets.

From fiber to the finished part – Fill delivers systems from the preforming process through to NDI. If you are seeking the best solution, shape your future with Fill.

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Langzauner GmbH

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E: andrew.gillen@netzsch.com
W: netzsch.com.au

NETZSCH Australia Pty Ltd

The Analyzing & Testing business unit of the NETZSCH Group (est. 1873, Germany) develops and manufactures a complete high-precision instrument line for thermal analysis and thermophysical properties measurement, as well as offering world class commercial testing services in our laboratories. Our instrumentation is employed for research, quality control and process control in the composites sector, the chemical industry and the areas of inorganics and building materials. Our innovative technological leadership and uncompromising quality standards make us one of the world's leading manufacturers in our trade.

ASSOCIATE PARTNER



Swinburne University of Technology

Swinburne is a world-ranked university leading the way in innovation, industry engagement and social inclusion. Our education, research and industry partnerships create positive change for students, staff and the community.

At Swinburne, we're proud that our high-quality research meets the demands of society, government and industry, and aims to improve the way we live and build a sustainable future.

Five key areas of focus drive our research centres and institutes. They include: future manufacturing, sustainable futures, digital frontiers, personal and societal wellbeing, and inspirational science and technology. Our Manufacturing Futures Research Institute integrates advanced manufacturing in the global value chain.

BOOTH 10

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W: swinburne.edu.au

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BOOTH 04

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W: Composites.usq.edu.au

University of Southern Queensland

University of Southern Queensland (USQ) has gained a reputation for pioneering research and development in engineered fibre composites. USQ prioritises R&D in advanced composite manufacturing, civil composites, smart materials, and geopolymers & concrete. USQ operates a dedicated industry test service for more than 1000 business clients across multiple sectors both nationally and internationally.

SUPPORTING PARTNER



BOOTH 03

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W: advanced-composites.unsw.edu.au

ARC Training Centre for Automated Manufacture of Advanced Composites (AMAC)

AMAC provides a platform for world-class Australian capability to create high-value, high-performance composites using high-rate, error-free processes.

The Training Centre lowers the barriers for Australian industry to access, engage, adopt and propagate automated composite manufacturing innovations.

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BOOTH 24

Ashish Kumar
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W: anton-paar.com/au-en/

Anton Paar Australia Pty. Ltd.

Anton Paar develops, produces and distributes highly accurate laboratory instruments and process measuring systems, and provides custom-tailored automation and robotic solutions.

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Prof. Priyan Mendis
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E: pamendis@unimelb.edu.au
W: camph.eng.unimelb.edu.au/

ARC Centre for Advanced Manufacturing of Prefabricated Housing (CAMP.H), The University of Melbourne

The ARC Training Centre for Advanced Manufacturing of Prefabricated Housing (CAMP.H) is the centrepiece for collaborative and innovative prefabricated building research in Australia.

The centre aims to unlock the potential growth of Australia's prefabricated building industry by creating a co-operative training system between industry and universities leading to local employment growth and increased exports of prefabricated products and services.

SUPPORTING PARTNER

**Lee Harper****T:** +44 115 951 3823**E:** lee.harper@nottingham.ac.uk**W:** cimcomp.ac.uk**CIMComp**

The EPSRC Future Composites Manufacturing Research Hub was launched in January 2017, led by the University of Nottingham and Bristol and includes 11 other national spokes.

It is a £10.3m investment to expand the UK's research effort towards delivering a step change in the production of polymer matrix composites, whilst training the next generation of composite engineers

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**BOOTH 08****Lindsey Gadinski****T:** +13 0253 36024**E:** lindsey@super-cone.com**W:** chinacone.com**CONE Technology**

CONE Technology Group, located in US, Japan and China, is committed to bring Carbon Nanotubes (CNTs) into our life.

With the mass production capability of high quality CNTs, a variety of available CNT morphologies including aligned CNT forest, powder, fiber, and freestanding films will meet your needs.

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**BOOTH 12****Jenny Thistlethwaite****T:** +61 408 761 177**E:** jenny.thistlethwaite@dksh.com**W:** direct.dksh.com.au/lab**DKSH Australia**

DKSH Scientific Instrumentation, within Business Unit Technology, supplies a wide range of laboratory instruments, scientific equipment, life science products and consumables, to laboratories in the government, research, university, contract analysis and industrial sectors. We also provide applications support and service across all the sectors.

The DKSH Scientific Instrumentation group offers products and services for Scientific Instrumentation, Automation & Online Analysers, General Laboratory Equipment, Environmental & Clinical Diagnostic Kits, Consumables and Reagents.

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AND ICCM22 BANQUET SPONSOR**Elsevier Materials Team****T:** +44 1865 843 577**E:** t.zou@elsevier.com**W:** elsevier.com**Elsevier**

Elsevier is a global information analytics business that helps scientists and clinicians to find new answers, reshape human knowledge, and tackle the most urgent human crises. For 140 years, we have partnered with the research world to curate and verify scientific knowledge. Elsevier's materials science journals' programme is the largest publishing programme in materials science, which includes our flagship title Materials Today as well as over 60 specialty journals covering full spectrum of materials science. In composites field, we are proud to serve the community with our premium collection of 6 titles: Composites Science and Technology, Composites Part A and B, Composite Structures, Cement and Concrete Composites, and Composites Communications

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**BOOTH 13****Rajesh Jagmohan****T:** +61 3 9720 3477**E:** Rajesh_Jagmohan@Instron.com**W:** instron.com.au/en-au/our-company/about-us?region=Australia&lang=en-AU**Instron**

Founded in 1946, Instron® is a recognized worldwide market leader in the materials testing industry.

Instron offers one of the largest product ranges in the industry, supplying systems and accessories from screw-driven electromechanical machines to servohydraulic fatigue, impact, rheology, through to structural testing rigs and crash simulation sleds.

SUPPORTING PARTNER

**Nelly Baron****T:** +06 46 39 19 16**E:** baron@jeccomposites.com**W:** jeccomposites.com**JEC Group**

JEC Asia 2019, the 3-day business & networking event dedicated to composites in Asia Pacific, will be held in Seoul on November 13-15, 2019 in parallel to eMove Asia.

Join composites key players gathering every year at JEC Asia to network and discover the endless possibilities of composites.

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BOOTH 15

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MDPI

MDPI is an academic open-access publisher with headquarters in Basel, Switzerland. MDPI publishes 202 peer-reviewed, scientific, open access journals.

All journals uphold a peer-reviewed, rapid, and rigorous publication process to publish your work under a CC BY license, in a fast and straightforward manner, and to reach a wide readership.

Quickstep Holdings Limited

Quickstep Holdings Limited is Australia's largest independent aerospace-grade advanced composite manufacturer, operating from advanced manufacturing facilities at Bankstown, NSW and an R&D/ process development centre in Geelong, Victoria. Quickstep employs more than 240 people in Australia and is partnering with some of the world's largest aerospace/ defence organisations including Lockheed Martin, Northrop Grumman, Boeing Defense and BAE Systems, as well as Australian-based Marand Precision Engineering and Chemring Australia.

Rheology Solutions Pty Ltd

Rheology Solutions was established in April, 1998 as a specialist sales and service organisation dedicated to the science of materials characterisation and are the exclusive Australian distributors for Thermo Scientific, Optical Control Systems, Sofraser and Schleibinger Gerate range of equipment and instrumentation.

Rheology Solutions has an established contract testing service and applications laboratory, equipped with a comprehensive range of rheology instruments to meet the requirements of materials characterisation testing. Seminars and application specific workshops are regularly offered and are designed to meet the needs of specific customer and industry applications.

SUPPORTING PARTNER AND ICCM22 WOMEN
IN COMPOSITES LEADERSHIP FORUM SPONSOR

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Customer Service

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RMIT University

RMIT is a global university of technology, design and enterprise. One of Australia's original tertiary institutions, RMIT University enjoys an international reputation for excellence in professional and vocational education, applied research, and engagement with the needs of industry and the community. RMIT's School of Engineering is renowned for its industry-relevant high-quality teaching and research, its globally competitive graduates and its international linkages. Our vision is to be recognised for innovative, industry-relevant teaching and research, and work-ready graduates

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Our ambition is to make a transformational impact on our region, and the world.

At UQ, we are developing new manufacturing methods and materials that provide solutions to the manufacturing and materials sector in a global economic context.

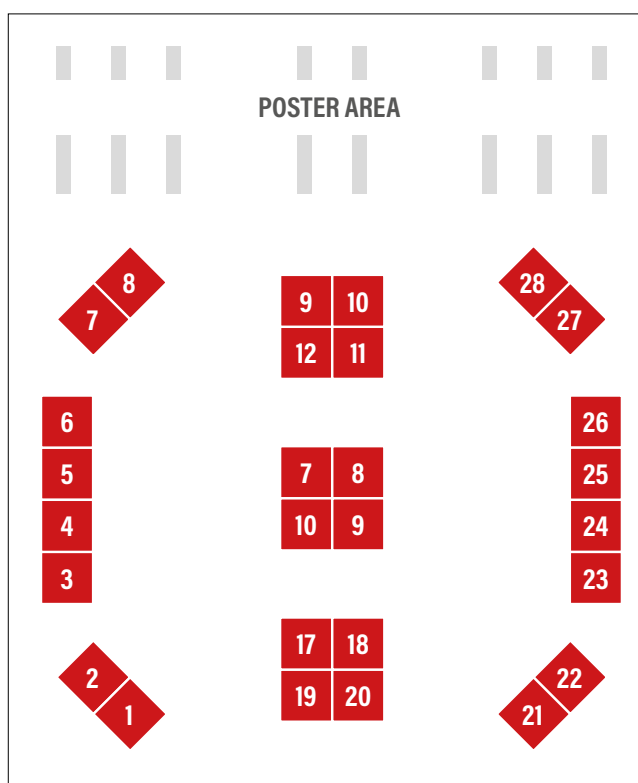
EXHIBITION

The exhibition will be located in the Exhibition Hall, Melbourne Convention and Exhibition Centre.

BOOTH	ORGANISATION
1	Langzauner GmbH
2	Fill Gesellschaft m.b.H.
3	ARC Training Centre for Automated Manufacture of Advanced Composites (AMAC)
4	University of Southern Queensland
5	ICCM23 Belfast
6	PerkinElmer
7	Blink Technology Australia
8	CONE Technology
9	TA Instruments
10	Swinburne University of Technology
11	Bruker Pty Ltd
12	DKSH Australia
13	Instron
14	MDPI
15	Rheology Solutions Pty Ltd
16	Thermo Fisher Scientific
17	Altair
18	Altair
19	MSC Software
20	University of Bristol
21	NETZSCH Australia Pty Ltd
22	Deakin University - Carbon Nexus
23	Atlas Innovations
24	Anton Paar Australia Pty. Ltd.

BOOTH	ORGANISATION
25	ARC Centre for Advanced Manufacturing of Prefabricated Housing (CAMP.H), The University of Melbourne
26	Quickstep Holdings Limited
27	Boeing
28	Boeing

EXHIBITION FLOOR PLAN



ARC Centre for Advanced Manufacturing of Prefabricated Housing (ARC-CAMP.H)

*“Unlocking the potential growth of Australia’s prefabricated building industry through **Research and Innovation**”*

Driven by industry, the ARC Training Centre for Advanced Manufacturing of Prefabricated Housing (CAMP.H) is the centrepiece for collaborative, eco-friendly, prefabricated housing and buildings research in Australia, striving to deliver breakthrough product and process innovations that will enable the Australian housing industry to compete on a global stage.

The centre aims to unlock the potential growth of Australia’s prefabricated building industry by creating a co-operative training system between industry and universities leading to local employment growth and increased exports of prefabricated products and services. The centre brings together a highly collaborative venture involving four universities and twelve industry partners. The four research programs being run in the centre are:

1. Innovation in design and enhancement of end-user experience
2. Developing advanced building systems and assembly techniques
3. Creating novel materials and composite structures
4. Supply chain and financing models

This initiative is a testament to the critical importance of this industry in Australia, and demonstrates the value that both industry and government place in collaborative, cross-disciplinary research. The centre will, in partnership with industry, prepare the next generation of industry professionals and researchers, and develop the materials, systems and design thinking that will transform the construction industry towards an advanced manufacturing future.

Website: <https://camph.eng.unimelb.edu.au/>

Contact: Prof. Priyan Mendis (Centre Director), pamendis@unimelb.edu.au
Dr. Kasun Shanaka Baduge (Centre Manager), kasun.kristombu@unimelb.edu.au



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ICCM22
MELBOURNE
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11-16 AUGUST 2019

22nd International Conference
on Composite Materials

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SCIENTIFIC PROGRAM

SCIENTIFIC PROGRAM CODES

The guide below shows you how to find sessions/presentations using session numbers/program numbers.

Please note that you can also search for presentations using the ICCM22 conference app.

ORAL PRESENTATION SESSIONS

The session number is made up of 4 digits: **XYZZ**

X = day (Monday = 1, Tuesday = 2)

Y = session number on the day

ZZ = room code

The program number of oral presentations is made up of the session number and the order of the presentation in each session.

XYZZ-VV

X = day (Monday = 1, Tuesday = 2)

Y = session number on the day

ZZ = room code

VV = presentation order in the session

In the printed program, the names of the concurrent rooms are listed below and their location can be found in the venue map of this program book.

Session room number	Convention Centre room number
01	Plenary hall 2
02	Meeting room 205
03	Meeting room 206
04	Meeting room 208
05	Meeting room 209
06	Meeting room 210
07	Meeting room 211
08	Meeting room 212
09	Meeting room 213
10	Meeting room 214
11	Meeting room 215
12	Meeting room 216
13	Meeting room 217
14	Meeting room 218
15	Meeting room 219

MINI ORAL PRESENTATION AND POSTER PRESENTATION SESSIONS

The poster session number is made up of 5 digits:

PXYZZ

P = poster

X = day (Monday = 1, Tuesday = 2)

Y = session number on the day

ZZ = room code for presentation

The program number for the mini oral presentations are made up as follows: **PXYZZ-VV**

P = poster

X = day (Monday = 1, Tuesday = 2)

Y = session number on the day

ZZ = room code for presentation

VV = presentation order in the session

PROGRAM COLOUR CODE

MONDAY 12 AUGUST

TUESDAY 13 AUGUST

WEDNESDAY 14 AUGUST

THURSDAY 15 AUGUST

FRIDAY 16 AUGUST

An aerial photograph of Melbourne, Australia, showing the city skyline, the Yarra River, and several large sports venues including the Melbourne Cricket Ground and the Melbourne Sports and Entertainment Centre. The image is used as a background for the conference poster.

ICCM22

MELBOURNE AUSTRALIA

11-16 AUGUST 2019

22nd International Conference
on Composite Materials

SCALA AND PLENARY LECTURES

SCALA AND PLENARY LECTURES

The Scala lecture and all plenary lectures will be held in Plenary 2, Melbourne Convention and Exhibition Centre.

MONDAY 12 AUGUST

Time	Title	Presenter	Affiliation
0900-0945	SCALA Lecture: ADVANCED COMPOSITES RESEARCH AND INNOVATION - AN AUSTRALIAN PERSPECTIVE	Murray Scott	Advanced Composite Structures Australia, Australia
0945-1030	NEW STRATEGIES FOR MANUFACTURING MULTIFUNCTIONAL COMPOSITES	Nancy Sottos	University of Illinois, USA
1400-1445	LIGHTWEIGHT CARBON FIBRE COMPOSITE AUTOMOTIVE WHEELS - FROM CONCEPT TO INDUSTRIALISATION	Jake Dingle	Carbon Revolution, Australia

TUESDAY 13 AUGUST

Time	Title	Presenter	Affiliation
0805-0850	THE STORY OF BIOBASED NANOMATERIALS AND THEIR USE IN COMPOSITE MATERIALS	Kristiina Oksman	Lulea University of Technology
1350-1435	SHAPE MEMORY POLYMER COMPOSITES AND 4D PRINTING TECHNOLOGIES: FROM THE AEROSPACE TO BIOMEDICAL APPLICATIONS	Jinsong Leng	Harbin Institute of Technology

WEDNESDAY 14 AUGUST

Time	Title	Presenter	Affiliation
0805-0850	FUTURE CHALLENGES FOR CARBON FIBRE COMPOSITES: A JOURNEY THROUGH THE VALUE CHAIN	Bronwyn Fox	Swinburne University, Australia
1345-1430	COMPOSITES 4.0: FROM DESIGN TO AUTOMATED MANUFACTURING	Peter Middendorf	University of Stuttgart, Germany

THURSDAY 15 AUGUST

Time	Title	Presenter	Affiliation
0805-0850	TRENDS IN AEROSPACE COMPOSITES	Jerry Young	Boeing, USA
1420-1505	DESIGN, MANUFACTURE AND PERFORMANCE OF TEXTILE COMPOSITES	Andrew Long	Nottingham University, UK

FRIDAY 16 AUGUST

Time	Title	Presenter	Affiliation
0805-0850	CHALLENGES IN COMPOSITES FOR MARINE STRUCTURES	Yapa Rajapakse	United States Office of Naval Research, USA



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KEYNOTE
LECTURES

KEYNOTE LECTURES

MONDAY 12 AUGUST

Time	Title	Presenter	Affiliation	Room
1100-1130	STRONTIUM TITANIUM OXIDE-GRAPHENE NANOCOMPOSITE THERMOELECTICS	Ian Kinloch	University of Manchester	Plenary 2
1100-1130	MULTIFUNCTIONAL ENERGY STORAGE COMPOSITE (MESC) STRUCTURES	Fu-Kuo Chang	Stanford University	Meeting room 210
1100-1130	FATIGUE LIFE OF POST-BUCKLED COMPOSITE STRUCTURES	Chiara Bisagni	TU Delft	Meeting room 211
1100-1130	ENHANCING LIGHTWEIGHTING: JOINING COMPOSITES WITH 3D PRINTED STRUCTURES	Stefanie Feih	A-Star	Meeting room 212
1100-1130	FILLING THE PROPERTY GAP OF MULTI- PHASE COMPOSITES THROUGH ARCHITECTURAL DESIGN	Hua-Xin Peng	Zhejiang University	Meeting room 213
1100-1130	3D PRINTABLE SHAPE MEMORY POLYMER COMPOSITES	Zhang Zhong	National Center for Nanoscience and Technology	Meeting room 219

TUESDAY 13 AUGUST

Time	Title	Presenter	Affiliation	Room
0900-0930	NANOCOMPOSITES AND HIERARCHICAL NANOENGINEERED ADVANCED COMPOSITES FOR ENHANCED MECHANICAL AND MULTIFUNCTIONAL PERFORMANCE	Brian Wardle	MIT	Plenary 2
0900-0930	SELF-HEALING FIBRE REINFORCED POLYMER COMPOSITES - A BRISTOL PERSPECTIVE	Ian Bond	University of Bristol	Meeting room 210
0900-0930	VIRTUAL DESIGN OF HIGH-PERFORMANCE DISCONTINUOUS-COMPOSITE STRUCTURES	Soraia Pimenta	Imperial College	Meeting room 211
0900-0930	POLYMER NANOCOMPOSITES UNDERFILL MATERIALS FOR ELECTRONIC PACKAGING	Yiu-Wing Mai	University of Sydney	Meeting room 212
0900-0930	OPPORTUNITIES AND CHALLENGES FOR COMPOSITES IN NEXT GENERATION MULTI-MATERIAL VEHICLES	Patrick Blanchard	Ford	Meeting room 213
0900-0930	ACCELERATED TESTING METHOD FOR DURABILITY OF CFRP	Yasushi Miyano	Kanazawa Institute of Technology	Meeting room 219

WEDNESDAY 14 AUGUST

Time	Title	Presenter	Affiliation	Room
0900-0930	MECHANICAL PROPERTIES AND FRACTURE RESISTANCE OF THREE-DIMENSIONAL GRAPHENE/ POLYMER COMPOSITES	Jang-Kyo Kim	University Science & Technology	Plenary 2
0900-0930	MODELING OF IMPACT DAMAGE AND COMPRESSION AFTER IMPACT OF LAMINATED COMPOSITE AEROSPACE STRUCTURES	Paul Davidson	Michigan University	Meeting room 211
0900-0930	INTERFACIAL DAMAGE IN FIBRE REINFORCED COMPOSITES MODELLED IN THE FRAMEWORK OF FINITE ELEMENTS WITH EMBEDDED REGIONS	Stepan Lomov	KU Leuven	Meeting room 212
0900-0930	CHARACTERISATION AND MODELLING OF STRUCTURAL BATTERY COMPOSITES	Lief Asp	Chalmers University	Meeting room 213
0900-0930	AN INTEGRATED APPROACH TO DESIGN AND MONITOR COMPOSITE STRUCTURES UNDER IN-SERVICE FATIGUE LOADINGS	Marino Quaresimin	Universita degi Studi di Padova	Meeting room 219

THURSDAY 15 AUGUST




Time	Title	Presenter	Affiliation	Room
1100-1130	DYNAMIC INSTABILITY OF ANISOTROPIC CYLINDERS IN CONFINING ENVIRONMENTS	Arun Shukla	University of Rhode Island	Plenary 2
1100-1130	THERE IS NO SUCH THING AS A COMPOSITE MATERIAL - ONLY COMPOSITES OF MATERIALS	John Hart-Smith	Boeing (retired)	Meeting room 211
1100-1130	INTEGRATING IMAGING TECHNIQUES FOR ASSESSING THE PERFORMANCE OF LARGE COMPOSITES STRUCTURES	Janice Barton	University of Southampton	Meeting room 213
1100-1130	REVEALING THE MOLECULAR-SCALE ROLE OF CARBON FIBRE FUNCTIONALISATION IN POLYMER COMPOSITES	Tiffany Walsh	Deakin University	Meeting room 219


FRIDAY 16 AUGUST

Time	Title	Presenter	Affiliation	Room
0900-0930	AMELOGENESIS: NATURE'S 3D PRINTING SYSTEM FOR MULTI-SCALE LAMINATES	Brian Cox		Plenary 2
0900-0930	MANUFACTURING RELATED DEFECTS -WHERE AND WHY THEY OCCUR, AND DO THEY MATTER?	Simon Bickerton	Auckland University	Meeting room 212
0900-0930	RESIN INFUSION COMPOSITES FOR AEROSPACE	Michael Edwards	Boeing Australia	Meeting room 213
0900-0930	MULTI-SCALE MODELING OF FIBER-REINFORCED PLASTIC COMPOSITES: FROM ATOMISTIC MODELING TO STRUCTURAL DESIGN	Tomonaga Okabe	Tohoku University	Meeting room 219

SCIENTIFIC PROGRAM

MONDAY 12 AUGUST																
Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211		Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
0830-0900	Opening ceremony															
0900-0945	SCALA Lecture: ADVANCED COMPOSITES RESEARCH AND INNOVATION - AN AUSTRALIAN PERSPECTIVE <i>Murray Scott, Advanced Composite Structures Australia, Australia</i> Plenary 2															
0945-1030	PLENARY LECTURE: NEW STRATEGIES FOR MANUFACTURING MULTIFUNCTIONAL COMPOSITES <i>Nancy Sottos, University of Illinois, USA</i> Plenary 2															
1030-1100	Coffee break Exhibition hall															
1100-1300	1101 Nano-composites	1102 Green & natural fibre composites	1103 Analysis of composite properties	1104 Automated fibre placement	1105 Hybrid composites	1106 Composite structures	1107 Computational and finite element methods		1108 Polymer matrix materials	1109 Interfaces and interphases	1110 Sensing 1: embedded sensing	1111 Structural power 1: multifunctional design and modelling	1112 Non-destructive evaluation	1113 Composite materials: route to impact	1114 Durability, creep and aggressive environment	1115 Joints
1100-1130	KEYNOTE 1: STRONTIUM TITANIUM OXIDE-GRAPHENE NANOCOMPOSITE THERMOELECTICS <i>Ian Kinloch, University of Manchester</i> (Plenary 2) KEYNOTE 2: MULTIFUNCTIONAL ENERGY STORAGE COMPOSITE (MESC) STRUCTURES <i>Fu-Kuo Chang, Stanford University</i> (Meeting room 210) KEYNOTE 3: FATIGUE LIFE OF POST-BUCKLED COMPOSITE STRUCTURES <i>Chiara Bisagni, TU Delft</i> (Meeting room 211) KEYNOTE 4: ENHANCING LIGHTWEIGHTING: JOINING COMPOSITES WITH 3D PRINTED STRUCTURES <i>Stefanie Feih, A-Star</i> (Meeting room 212) KEYNOTE 5: FILLING THE PROPERTY GAP OF MULTI-PHASE COMPOSITES THROUGH ARCHITECTURAL DESIGN <i>Hua-Xin Peng, Zhejiang University</i> (Meeting room 213) KEYNOTE 6: 3D PRINTABLE SHAPE MEMORY POLYMER COMPOSITES <i>Zhang Zhong, National Center for Nanoscience and Technology</i> (Meeting room 219)															
1130-1140	Move to concurrent sessions															
1140-1200	1101-1 GRAPHENE: NOVEL BARRIER MATERIAL FOR CORROSION PROTECTION; IMPROVING SERVICE LIFE OF OFFSHORE PAINT <i>Norfarah Aba, Petronas Research Sdn Bhd</i>	1102-1 MULTISCALE ANALYSIS TO INVESTIGATE THE MECHANICAL AND FORMING BEHAVIOUR OF HEMP FIBRE WOVEN FABRICS / POLYPROPYLENE COMPOSITE <i>Sheedev Antony, University of Technology of Troyes</i> In this study, mechanical behaviour of hemp fibre woven fabrics / polypropylene composites in different scale (dry yarn, dry fabrics, composite) and formability of the composite sheets were investigated.	1103-1 EFFECTIVE PROPERTIES OF HYBRID NANO COMPOSITES <i>SS Godara, Rajasthan Technical University Kota, Rajasthan, India</i> A hybrid smart composite reinforced with carbon nanotubes (CNTs) and piezoelectric fibers is proposed. The effective properties for the purposed composite are estimated.	1104-1 TOOLPATH STRATEGY & GENERATION FOR ROBOTIC FIBRE PLACEMENT ON CURVED SURFACES <i>Felix Raspall, Singapore University of Technology and Design</i> The paper attempts to provide a simple tool for trajectory generation and its optimization for use with an automated/ robotic fibre placement (AFP) machine for layup on freeform curved surfaces.	1105-1 GRAPHENE-BASED MATERIALS AS STRAIN SENSORS IN FIBRE/ EPOXY MODEL COMPOSITES <i>Jingwen Chu, The University of Manchester</i> This study has demonstrated the use of both discontinuous graphene nanoplatelets and continuous CVD grown graphene as strain sensors in a glass fiber/epoxy model composite using Raman spectroscopy.	1106-1 NOVEL AUXETIC THERMOSET AND THERMOPLASTIC COMPOSITES FOR ENERGY ABSORPTION <i>Raul Figueiro, Universidade do Minho</i>	1107-1 MINIMIZATION OF SINK MARKS FOR INJECTION MOULDED KENAF/ PP COMPOSITES IN INJECTION MOULDING PROCESS BY NUMERICAL SIMULATION <i>Abu Bakar Sulong, Universiti Kebangsaan Malaysia</i> The moulding parameter of injection moulded kenaf/ PP composites investigated by numerical simulation. Response surface method (RSM) is used to optimise different parameters of kenaf/ PP with 20 wt% kenaf.		1108-1 MECHANICAL PROPERTIES OF A STEEL-REINFORCED RESIN UNDER STATIC AND CYCLIC LOADING <i>Martin Nijgh, Delft University of Technology</i>	1109-1 NEW INTERFACIAL AGENT FOR ENHANCED INTERFACIAL SHEAR STRENGTH IN PPS/CARBON COMPOSITES <i>Baptiste Gaumond, IMP Lab - INSA de Lyon - Lyon University</i> In this work, we investigated the interphase built between ex-PAN carbon fibers and two different matrices which were polyphenylene sulfide (PPS) and imidazolium modified polyphenylene sulfide (PPS _{ImCl}).	1110-1 MULTIFUNCTIONAL COMPOSITE WITH PRINTED SENSORS <i>PengHeng Xie, University of Chester</i>	1111-1 CARBON FIBRE COMPOSITES AS BATTERIES, SENSORS, ACTUATORS AND ENERGY HARVESTING <i>Dan Zenkert, Kth Royal Institute of Technology</i> The presentation will give an overview of the present status of these multifunctional possibilities using electrochemically activated carbon fibres and their composites	1112-1 EVALUATION OF LARGE AEROSPACE COMPONENT BASED ON 3D THERMO-TOMOGRAPHY MODEL <i>Christoph Frommel, German Aerospace Center (DLR)</i> Slowly but surely, more and more automated thermography measurement is being applied in industry. Thermography provides a high sensitivity for most defects, high accuracy in locating defects and mostly used in reflection mode, which is important for complex and large aerospace components.	1113-1 EFFECT OF VARIABLE CORE STIFFNESS ON IMPACT RESPONSE OF CURVED SANDWICH PLATES <i>Hessam Ghasemnejad, Cranfield University</i> This study presents the influence of water exposure on unidirectional, plain weave, and twill weave CFRP particularly in the interfacial region with the use of acoustic emission, optical strain measurement, and scanning electron microscope.	1114-1 THE INFLUENCE OF WATER ABSORPTION ON THE DAMAGE MECHANISM OF UNIDIRECTIONAL AND 2D WOVEN CFRP <i>Faisal Almudaihesh, Cardiff University</i>	1115-1 ON THE INTERFACIAL CRACK PROPAGATION IN ADHESIVE BONDING <i>Johnatan Leplat, IRDL, CNRS UMR 6027, ENSTA Bretagne</i>
1200-1220	1101-2 MAGNETIC CONTROL OF MICROSTRUCTURE IN GRAPHENE EPOXY NANOCOMPOSITES <i>Mark Eaton, Cardiff University</i> This paper investigates the magnetisation of graphene via decoration with Iron Oxide. Graphene flakes are actuated in epoxy composites using very low (<100mT) fields strengths. The control of orientation and microstructure is demonstrated leading to control and enhancement of properties.	1102-2 DELIGNIFIED WOOD REINFORCED COMPOSITES (DWRC) <i>Marion Frey, Eth Zürich</i> Delignified densified wood represents a new promising lightweight, high-performance and bio-based material with high potential to partially substitute natural fiber reinforced- or glass fiber reinforced composites in the future.	1103-2 INVERSE ANALYSIS FOR COMPOSITE SINGLE-LAP ADHESIVELY BONDED JOINT <i>Xiao Wei, Shanghai Jiao Tong University</i> An inverse method is proposed to determine the interface elasticity parameters, which could character the mechanics properties of the adherend-adhesive interface for composite adhesively bonded joint.	1104-2 MANUFACTURE OF CO-CURED INTEGRAL HAT-TIFFENED PANEL WITH AUTOMATED FIBRE PLACEMENT <i>Cong Zhao, Nanjing University of Aeronautics and Astronautics</i> A hat-stiffened panel was manufactured based on automated fibre placement and co-curing process. Factors influencing geometric and fibre distribution of hat-stiffened panel were discussed, including material properties and process parameters.	1105-2 THE COMBINED EFFECT OF MOISTURE AND TEST TEMPERATURE ON THE PSEUDO-DUCTILITY OF THIN-PLY HYBRID COMPOSITES <i>Gergely Czél, Budapest University of Technology and Economics</i> Interlayer hybrid configurations with continuous and discontinuous carbon between continuous glass layers were investigated. Both temperature and moisture reduced the damage initiation strain and especially the interfacial properties of the hybrids.	1106-2 ELIMINATING CURE-DRIVEN DEFORMATION OF OUT-OF-AUTOCLAVE COMPOSITES VIA OUT-OF-OVEN ZONAL CURING <i>Tomasz Garstka, Lean Manufacturing & Assembly Technologies (LMAT) Limited</i>	1107-2 DESIGN OF PHOTOTHERMAL TRIGGERED BILAYER MORPHING COMPOSITES <i>Julio Aguilar-Tadeo, The University of Manchester</i>		1108-2 CRITICAL VOID CONTENT OF CF/PEEK THERMOPLASTIC COMPOSITES: IMPACT ON NDT AND MECHANICAL PROPERTIES <i>Diego Saenz-Castillo, FIDAMC</i>	1109-2 COLOURED CARBON FIBERS WITH ENHANCED PHYSICAL AND ADHESION PROPERTIES <i>Luke Henderson, Deakin University</i> The generation of colour on carbon fibers has long been desired. This talk will summarise our recent efforts in surface modification and how this has led to coloured carbon fibres and the improvement of their physical properties and adhesion in epoxy matrices.	1110-2 STRAIN MEASUREMENT OF 3D PRINTED SHORT CARBON FIBER REINFORCED PLASTICS USING ELECTRIC PROPERTY <i>Keisuke Iizuka, Tokyo Institute of Technology</i> The strain of short carbon fiber reinforced plastics was measured by the electric property change. The temperature and frequency dependence of the electric property were clarified.	1111-2 FUTURE CHALLENGES AND INDUSTRIAL ADOPTION STRATEGIES FOR STRUCTURAL SUPERCAPACITORS <i>Emile Greenhalgh, Imperial College London</i> The presented airflow-based methods provide a quality assessment of semi-finished textiles without the need for reference measurements or historical data, with a strong focus on fast and simple measurements.	1113-2 TEMPERATURE RESISTANCE OF EPOXY-BASED POLYMER COATING WITH FLY ASH AND FIRE RETARDANT FILLERS FOR COMPOSITE MATERIALS <i>Mojdeh Mehrinejad, Khotbehsara, University of Southern Queensland</i> This work investigates the use of accelerated ageing of composite specimens when exposed to an environment of immersion in water, elevated pressure and mechanical loading.	1114-2 EFFECT OF ACCELERATED AGEING AND MOISTURE ABSORPTION ON MECHANICAL AND CHEMICAL PROPERTIES OF POLYMER COMPOSITES <i>Jasmine Bone, National Physical Laboratory / Element Materials / University of Surrey</i>	1115-2 IMPROVEMENT OF THE LAP SHEAR STRENGTH OF RESISTANCE-WELDED THERMOPLASTIC COMPOSITE JOINTS USING A SILANE SOL-GEL COATING ON THE STAINLESS-STEEL HEATING ELEMENT <i>Vincent Rohart, École de technologie supérieure</i> Resistance welding of thermoplastic composites is performed with a stainless-steel heating element which have low affinity with the PPS matrix. Mechanical performances of welded joints were improved by a silane coating on the stainless-steel.	

MONDAY 12 AUGUST																	
Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211			Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
1220-1240	1101-3 GRAPHENE-ENHANCED COMPOSITE PAINTS FOR CORROSION PROTECTION OF OFFSHORE RISERS <i>Mohd Shamsul Farid Samsudin, Petronas Research</i>	1102-3 ENHANCEMENT OF NOISE MITIGATION OF NATURAL FIBRE COMPOSITES WITH PERFORATION <i>Heow Pueh Lee, National University of Singapore</i> Natural fiber based composites are finding increasing use in products like the interior parts of automobiles, electronics casings, as reinforcements in the building and construction industry. Micro-perforated plates (MPPs) are new-generation sound absorbers and they are commonly used as noise absorption panels.	1103-3 CONTINUUM DAMAGE MECHANICS MODELLING OF A 3D PRINTED CURVILINEAR CFRTP <i>Masahito Ueda, Nihon University</i>	1104-3 INVESTIGATION ON THE CRUSH PERFORMANCE OF AUTOMATED FIBRE PLACEMENT MANUFACTURED COMPOSITE TUBES <i>Matthew David, UNSW Sydney</i> A successful methodology has been implemented to study the influence of fiber architecture on crush performance. This is important for designing AFP manufactured energy absorbing structures such as helicopter and aircraft subfloors.	1105-3 INFLUENCE OF ALUMINIUM SURFACE TREATMENT ON BOND QUALITY IN ALUMINIUM/GLASS/EPOXY FIBRE METAL LAMINATES <i>Mitch Dunn, The University of Queensland</i> Hybrid composite structures combining aluminium alloy and glass/epoxy are considered, with a focus on how the surface preparation of the aluminium influences bond quality.	1106-3 FRACTURE MECHANICS-IN-FORMED MULTI-SCALE THERMO-MECHANICAL DAMAGE MODEL FOR CERAMIC MA-TRIX COMPOSITES <i>Travis Skinner, Arizona State University</i>	1107-3 UNDERSTANDING FAILURE INITIATION LOCATIONS IN STOCHASTIC VIRTUAL COMPOSITE SPECIMENS USING A MACHINE LEARNING FRAMEWORK <i>Nimal Kumar Balasubramani, University of New South Wales</i>			1108-3 INFLUENCE OF MOISTURE GRADIENTS ON THE BENDING PROPERTIES OF SHORT GLASS FIBER REINFORCED POLYAMIDE 6 <i>Anna Katharina Sambale, TU Dortmund University</i> This contribution investigates the influence of moisture gradients on the bending properties of short-glass-fiber-reinforced polyamide 6 at constant integral moisture content using three-point bending test	1109-3 DIRECT MEASUREMENT OF INTERFACIAL SHEAR STRENGTH OF MWCNT/NBR NANOCOMPOSITE <i>Chun-yen Hsu, Super C Inc</i>	1110-3 MULTIFUNCTIONAL FIBRE REINFORCED COMPOSITES: FROM SMART OUT-OF-OVEN MANUFACTURING TO INTEGRATED SENSING AND DE-ICING CAPABILITIES <i>Han Zhang, Queen Mary University of London</i> An extremely energy efficient and intrinsically safe method to manufacture thermoset based FRPs with integrated multifunctionalities has been developed. The embedded nanocomposite layer can be used from out-of-oven curing to strain/damage sensing and de-icing.	1111-3 MODELLING AND DESIGN OF STRUCUTRAL BATTERIES WITH LIFE CYCLE ASSESSMENT <i>Wilhelm Johannisson, KTH Royal Institute of Technology</i> A bottom-up analytical modelling of a structural battery's ability to save system mass. Investing mechanical properties, electrochemical properties, and a life cycle assessment.	1112-3 ULTRASONIC INSPECTION OF HYBRID COMPOSITES AND BONDED COMPOSITE JOINTS <i>Matthew Ibrahim, Defence Science and Technology</i>	1113-3 IMPACT BEHAVIOR OF SANDWICH STRUCTURES BASED ON CORRUGATED COMPOSITE CORES FILLED WITH PVC FOAM <i>Jin Zhou, University of Liverpool</i> The impact response of sandwiches base on corrugation core filling with PVC foam have been investigated experimentally and numerically. The configuration optimization of the hybrid sandwiches was studied base on thickness of corrugation cores and density of filled foam.	1114-3 MICROBIAL EFFECT ON THE DURABILITY OF WOVEN CARBON/VINYL ESTER COMPOSITES <i>Alejandra Castellanos, University of Wisconsin-madison</i>	1115-3 LASER BASED PRETREATMENT OF ALUMIUM CASTINGS FOR HYBRID INJECTION MOLDING <i>Julian Steinberg, Technische Universität Braunschweig - Institute of Joining and Welding</i> For reducing vehicles weight, this paper presents a promising approach using the hybrid injection molding process to join laser pretreated cast aluminum parts with polyamid 6.
1240-1300	1101-4 JANUS GRAPHENE NON-WOVEN FABRICS FOR ULTRALIGHT ELECTROMAGNETIC INTERFERENCE SHIELDING <i>Ying Wu, University of Science and Technology Beijing</i>				1105-4 INFLUENCE OF THE COOLING RATE ON THE ADHESIVE PROPERTIES OF POLYAMID-6-GALVANIZED-STEEL HYBRIDS IN THE ONE-STEP FORMING PROCESS <i>Tobias Fischer, Clausthal University of Technology</i> The focus of this work is the production in a one-step variothermal pressing process and in this context the influence of the cooling rate on the bonding quality of the mono-materials.	1106-4 CRACK CONTROL FOR BIO-INSPIRED TOUGHENING OF COMPOSITE MATERIALS AND STRUCTURES <i>Adrian Orifici, RMIT University</i>	1107-4 FINITE ELEMENT ANALYSIS OF CFRP-TO-CFRP JOINT STRUCTURE CONTAINING FIBER-METAL LAMINATES <i>Dong-woo Lee, Changwon National University</i> In this study, it was developed that the analytical model of CFRP-to-CFRP structure by using cohesive zone modeling (CZM) method, which containing fiber-metal laminates.		1108-4 MANUFACTURING PROCESS AND PROPERTIES OF CARBON FIBER REINFORCED PEEK COMPOSITES MODEFIED WITH MWNTS <i>Jiupeng Song, Beihang University</i> In this work, carbon fiber/poly(ether ether ketone) (CF/PEEK) composites were prepared by the wet powder impregnation. PEEK powders were mixed with different content of multi-walled carbon nanotubes (MWCNTs) in water homogeneously.		1110-4 GRAPHENE OXIDE/GRAPHITE NANOSHEETS COMPOSITE THIN FILMS FOR WEARABLE STRAIN SENSORS <i>Qingbin Zheng, The Hong Kong University of Science and Technology</i> We utilize the graphene oxide and graphite nanosheets composite thin films as sensing materials to fabricate high-performance strain sensors via a simple, cost-effective and solution processable strategy.	1111-4 STRUCTURAL POWER PERFORMANCE REQUIREMENTS FOR FUTURE AIRCRAFT INTEGRATION <i>Sang Nguyen, Imperial College London</i> This paper investigates the application of structural power in aircraft cabins by integrating floor panels with face sheets made of structural power composites to power the in-flight entertainment system.	1112-4 PAGOSA / MATCH MODELING OF HIGH EXPLOSIVE RESPONSES TO LOW SPPEED INSULTS <i>Xia Ma, LANL</i>	1113-4 INTERLAMINAR SHEAR PROPERTIES OF TOUGHENED CARBON FIBRE REINFORCED COMPOSITES <i>Andreas Klingler, Institute for Composite Materials (IVW GmbH)</i> Toughening of thermoset based CFRP by core-shell rubber and block-copolymer hybrids leads to a drastically improved mode II, shear performance. Hence, increasing damage threshold properties are to be expected.	1114-4 ASSESSMENT OF A LOW TEMPERATURE CURE RESIN FOR HIGH TEMPERATURE COMPOSITE OVERWRAP REPAIRS <i>Yee Chech Tan, PETRONAS Research</i>	1115-4 EFFECTS OF RESISTANCE HEATING ELEMENT ON JOINING STRENGTH OF CF/PPS COMPOSITES <i>Kota Tamura, Kindai University</i> This study focuses on resistance heating elements and aims to reveal the bonding behavior of the CFRTP by resistance welding method using carbon fiber heating element.	
1300-1400	Lunch Exhibition hall																
1300-1400	Boeing lunch symposium - University and industry collaboration, focus on composite material development *invitation only event* <i>Michael Edwards, Facilitator Bronwyn Fox, Swinburne Uni Research Director Stuart Bateman, RMIT Professor of Aerospace Sarah McSwiney, BR&T-A Research Manager Plenary 2</i> <div></div>																
1310-1355	MSC Software Industry roundtables - 10x Material Solution from e-Xstream Engineering, What is the future of material modeling ? *invitation only event* <i>Soumik Chakrabarty, Emilie Storms Meeting room 218</i> <div></div>																
1400-1445	PLENARY LECTURE: LIGHTWEIGHT CARBON FIBRE COMPOSITE AUTOMOTIVE WHEELS - FROM CONCEPT TO INDUSTRIALISATION <i>Jake Dingle, Carbon Revolution, Australia</i> Plenary 2																
1445-1500	Move to concurrent sessions																
1500-1600	1201 Aerospace	1202 Processing & properties of composites	1203 Green & natural fibre composites		1205 Automated fibre placement	1206 Composite structures	1207 Langzauner GmbH industry session			1208 Hybrid composites	1209 Interfaces and interphases	1210 Structural health monitoring	1211 Structural power 2: multifunctional constituents	1212 Non-destructive evaluation	1213 Recycling and sustainability	1214 Tsai award presentations	1215 Joints
1500-1520	1201-1 LIFE MANAGEMENT OF ADHESIVELY BONDED COMPOSITE STRUCTURES <i>Lucy Li, National Research Council Canada</i> A numerical model is presented to analyze the thermal behavior of the tapes at microscale during automated tape placement (ATP) process. A 3D geometrical model is developed considering the real microstructure.	1202-1 THERMAL BEHAVIOR OF TAPES IN AUTOMATED TAPE PLACEMENT (ATP) PROCESS-MICRO ANALYSIS <i>Ketaki Mishra, Université De Nantes</i> In order to enhance the mechanical and surface properties of jute fibers, the surface of jute fibers were deposited size-controlled nano-SiO2 particles via sol-gel technique.	1203-1 INFLUENCE OF IN SITU DEPOSITING SIZE-CONTROLLED NANO-SIO2 PARTICLES ON THE MECHANICAL AND SURFACE PROPERTIES OF JUTE FIBERS <i>Xuan Liu, Institute of Materials Science and Technology, Nanjing University of Aeronautics and Astronautics</i> In order to enhance the mechanical and surface properties of jute fibers, the surface of jute fibers were deposited size-controlled nano-SiO2 particles via sol-gel technique.		1205-1 XENON FLASH-LAMP BASED IN-SITU AUTOMATED FIBER PLACEMENT OF THERMOPLASTIC COMPOSITES <i>Lars Brandt, German Aerospace Center (dlr)</i> An opportunity for flexible, cost-effective production of aerospace components is found in the usage of new heating systems such as the pulsed xenon flashlamp, since it renders the use of complete safety housing unnecessary.	1206-1 THE INFLUENCE OF GEOMETRIC IMPERFECTIONS OF DIFFERENT TOLERANCE LEVELS ON THE BUCKLING LOAD OF UNSTIFFENED CFRP CYLINDRICAL SHELLS <i>Tobias Hartwich, Hamburg University of Technology</i> Unstiffened CFRP cylindrical shells under axial compression prone to buckle. One of the most influencing factor on the buckling load are geometric imperfections which are analysed in this contribution.	Langzauner GmbH industry session *invitation only event* CHALLENGES IN INDIVIDUAL AUTOMATION SOLUTIONS FOR INCREASING PRODUCTION EFFICIENCY IN AVIATION <i>Bernhard Hauer</i> Sponsored by 		1208-1 COMPRESSIVE FAILURE OF HYBRID CFRP-CFRP LAMINATED COMPOSITES <i>Mark Battley, University of Auckland</i> The effect of hybridisation of HM and UHM carbon fibre laminates on strength and stiffness under compression was investigated through physical testing and analysis.	1209-1 COMPARISON OF DIFFERENT INTERFACIAL ENGINEERING METHODS TO ACHIEVE PSEUDO-DUCTILE BEHAVIOUR OF CARBON FIBER REINFORCED POLYMER COMPOSITES <i>Balázs Magyar, Budapest University of Technology and Economics</i>	1210-1 A NANOCOM-POSITES-BASED, ALL-INKJET-PRINTED, FLEXIBLE, ULTRA-BROADBAND FILM SENSOR FOR IN-SITU ACQUISITION OF DYNAMIC STRAIN <i>Pengyu Zhou, The Hong Kong Polytechnic University</i> All inkjet-printed nanocomposite sensors for structural health monitoring are developed and the printed sensors are of the advantages of high sensitivity and fidelity, as well as broadband sensing frequency up to 500 kHz.	1211-1 FEASIBLE MANUFACTURING TECHNIQUE AND MECHANICAL PROPERTIES OF STRUCTURAL BATTERY ELECTRODES <i>Lynn Maria Schneider, Kth Royal Institute of Technology</i> A feasible manufacturing process for multifunctional structural batteries is presented. The technique is evaluated with respect to the multifunctional performance of the matrix material and of a negative structural electrode.	1212-1 ON THE INTERACTION BETWEEN NONLINEAR SOLITARY WAVES AND LAMINATED COMPOSITE BEAMS <i>Andreas Schiffer, Khalifa University</i> Experiments and numerical calculations are performed to study the interaction between nonlinear solitary waves in granular chains and laminated composite beams.	1213-1 INVESTIGATION OF THE PROCESS RESISTANCE OF FIBRE SURFACE TREATMENTS FOR THERMOPLASTIC COMPOSITES USING RECYCLED CARBON FIBRE <i>Christina Froemder, ELG Carbon Fibre</i> The international research and collaboration between universities and industry shows a novel step forward and offers a tentative view in combining gentle and quick electrochemical treatments on recycled carbon fibres.	1214-1 INVESTIGATION OF THE HYBRID EFFECT IN HIGH PERFORMANCE QUASI-ISOTROPIC THIN-PLY CARBON/GLASS COMPOSITES UNDER TENSION <i>Guillermo Idarraga, National University of Colombia</i> Stiffness of the adjacent layers and the stacking sequence play an important role in the failure strain of the carbon plies and therefore in the hybrid effect.	1215-1 ULTRASONIC SPOT WELDING BEHAVIOR OF WOVEN-CF/PPS LAMINATES USING CF/PPS ENERGY DIRECTOR <i>Horiuchi Tokiyuki, National Institute of Technology, Wakayama College</i> This study aims to development the ultrasonic spot welding process of CFRTP using flat energy director and carbon fiber reinforced energy director.	



MONDAY 12 AUGUST																	
Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211			Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
1520-1540	1201-2 EXPERIMENTAL STUDY OF ICE IMPACT ON ALUMINUM/ CARBON FIBER REINFORCED COMPOSITE DUAL PLATE <i>Gang LUO, Nanjing University of Aeronautics and Astronautics, Nuaa</i> An experiment of ice ball impact on Aluminum/Carbon Fiber Reinforced Composite dual plate was carried out to study the dynamic responses and damage of the target. The external and internal damage of Aluminum/ Composite dual plate were described in this presentation.	1202-2 MANUFACTURING OF CARBON- AND GLASS-FIBER COMPOSITES USING FRONTAL POLYMERIZATION <i>Elyas Goli, University of Illinois At Urbana-champaign</i>	1203-2 RESEARCH ON SYNTHESIS OF CHITOSAN BASED METAL FLAME RETARDANT FOR FLAMMABLE COMPOSITES <i>Prabhakar M.N., Changwon National University</i>		1205-2 EXPERIMENTAL INVESTIGATION ON THE PERFORMANCE OF CARBON- EPOXY LAMINATES CONTAINING GAPS FABRICATED BY AUTOMATED FIBER PLACEMENT <i>Vincent Cadran, Mcgill University</i>	1206-2 STUDIES ON PROPERTY ENHANCEMENT BY GRAPHENE OXIDE IN POLYMER-BASED COMPOSITES SERVICED AT LOW TEMPERATURE ENVIRONMENT <i>Pui Yan Hung, Swinburne University of Technology</i>	Langzauner GmbH industry session *invitation only event* CHALLENGES IN INDIVIDUAL AUTOMATION SOLUTIONS FOR INCREASING PRODUCTION EFFICIENCY IN AVIATION <i>Bernhard Hauer</i> Sponsored by  CONTINUED			1208-2 EXAMINATION OF THE INTERFACE STRENGTH OF HYBRID, OVERMOULDED THERMOPLASTIC COMPOSITE PARTS <i>Yves Becker, Institut für Verbundwerkstoffe GmbH</i>	1209-2 INTERPHASE ANALYSIS OF POLYAMIDE66 LAMINATES WITH PROTONATED AND DEUTERATED POLYMERS <i>Takuya Matsumoto, Kobe University</i> We focused on the adhesion interphase of polyamide 66 laminates. For the interphase analysis with confocal Raman scattering spectroscopy, the protonated and deuterated polyamide 66 were employed.	1210-2 MONITORING APPROACH FOR FATIGUE DAMAGE ONSET THRESHOLD DETERMINATION IN COMPOSITES CONTAINING FLAWS <i>Ahmed Maslouhi, Université de Sherbrooke</i> This paper presents an original approach based mainly on acoustic emission monitoring to determine fatigue life thresholds to damage initiation concerned in composites with embedded artificial flaws. This study combines two health monitoring techniques to determine fatigue life curves and to estimate stiffness degradation for plain weave composites containing flaws.	1211-2 PREDICTING THE CONSOLIDATION OF FABRIC- REINFORCED STRUCTURAL POWER COMPOSITES <i>Maria Valkova, Imperial College</i> A laminate consolidation finite element model for prediction of meso-architecture and fibre packing in structural power composites employing a hybrid woven fabric-reinforced construction.	1212-2 ASSESSMENT OF ADHESIVE BOND QUALITY BY USING ULTRASONIC TESTING COMBINED WITH PATTERN RECOGNITION <i>Jens Schuster, University of Applied Sciences Kaiserslautern</i> The aim of this study has been to develop pattern recognition as an approach to identify kissing bonds in adhesive joints by means of ultrasonics. For this purpose, kissing bonds have been attempted to be manufactured in by varying ratios of a two-part adhesive.	1213-2 ON THE RESIZING OF RECYCLED FIBRES <i>Essi Sarlin, Tampere University</i>	1214-2 PROCESS- INDUCED FAILURE OF DELTOD IN COMPOSITE T-JOINT: FIBER- OPTIC BASED MONITORING AND NUMERICAL SIMULATION <i>Shinsaku Hisada, The University of Tokyo</i>	1215-2 INVESTIGATIONS ON THERMALLY INDUCED DELAMINATION IN MECHANICALLY JOINED CARBON FIBER COMPOSITES <i>Julian Vorderbruggen, University of Paderborn</i> Thermally induced damages in mechanically joined CFRP metal joints occur during heat treatment according to automotive dip coating. Those damages are being investigated and minimized by suitable countermeasures in this presentation.
	1540-1600	1201-3 LIGHTNING DAMAGE ASSESSMENT INTO COMPOSITE BASED ON SURFACE EXPLOSION AND FIBER BREAKAGE <i>Audrey Bigand, Institut Clément Ader</i> Study of the damage generated in the CFRP due to lightning strike thanks to an Abaqus VDLOAD for shock explosion pressure and a VUMAT for damage law.	1202-3 A NOVEL WHOLE SELF-LOCKED COMPOSITE THIN- WALLED TUBE SYSTEM <i>Yang Zhao, Chongqing University</i>	1203-3 EXTRACTED LIGNIN FROM NATIVE AUSTRALIAN LIGNOCELLULOSIC BIOMASS AS A POWERFUL AGENT FOR HIGH- PERFORMANCE COMPOSITES <i>Shammi Sultana Nisha, Swinburne University of Technology</i> The present study aims to design high performance functionalized lignin-epoxy composites. In this work, the triethylammonium hydrogen sulphate ionic liquid (IL) was introduced onto the surface of lignin micro/ nanoparticles while it was extracted from biomass, to prepare a highly functional and reinforcing IL-Lignin filler in an epoxy matrix.		1205-3 EFFECT OF TEMPERATURE ON IMPACT BEHAVIOUR OF POLYAMIDE 6/ WOVEN BASALT FIBRES LAMINATES <i>Russo Pietro, National Council of Research</i>	1206-3 MANUFACTURING AND TESTING OF CLOSED-LOOP GLASS FIBER CYLINDRICAL EPOXY COMPOSITES USING VARTM <i>Monis Kazmi, University of Auckland</i> This research focuses on finding the potential to manufacture hollow cylindrical epoxy composite structures with both flat and curved profiles using VARTM. The flat and curved composites were tested under tension and shear.				1209-3 TAILORING INTERFACIAL ADHESION IN BASALT FIBRE REINFORCED POLYMER COMPOSITES <i>Maria Carolina Seghini, Sapienza-Università di Roma</i>	1210-3 IN-SITU SENSING OF RANDOM FAILURE IN COMPOSITE STRUCTURES <i>Suong Hoa, Concordia University</i> Development of random failure in composite structures due to cyclic loading can be detected using the method presented in the paper.	1211-3 UNIT CELLS FOR MULTIPHYSICS MODELLING OF STRUCTURAL BATTERY COMPOSITES <i>David Carlstedt, Chalmers University of Technology</i> Multiphysics modelling of structural battery composites is discussed. FE-models are setup to study if modelling techniques for conventional batteries can be used to describe the electrochemical behaviour of this material.		1213-3 RESIN TRANSFER PRESSING - A NOVEL PROCESS FOR LARGE SCALE COMPOSITE MANUFACTURING <i>Christian Goergen, Institut für Verbundwerkstoffe GmbH</i> A new process is introduced, called „Resin Transfer Pressing“ (RTP). RTP exploits specific advantages of recycled nonwoven fabrics in a thermoset press process and provides short cycle times.	1214-3 MULTISCALE COMPUTATIONAL MODEL FOR POLYMER MATRIX COMPOSITES UNDER IMPACT LOADING, INCLUDING ADIABATIC HEATING EFFECTS <i>Christopher Sorini, Arizona State University; Nasa</i> A multiscale computational approach is taken to investigate the effects of local matrix adiabatic heating on the ballistic impact response of a T700/Epon 862 [0°/60°/-60°] triaxially braided composite.	1215-3 INTERLAMINAR FRACTURE TOUGHNESS OF CO- CONSOLIDATED CF/ PEEK LAMINATES MANUFACTURED IN STMAP-JOINING PROCESS <i>Julian Weber, Institut Für Verbundwerkstoffe GmbH</i>
1600-1630	Coffee break Exhibition hall																
1630-1830	1301 Nano-composites	1302 Bio-inspired composites	1303 Green & natural fibre composites	1304 Design and manufacture for multifunctionality	1305 Automated fibre placement	1306 Composite structures	1307 Computational and finite element methods			1308 Polymer matrix materials	1309 Interfaces and interphases	1310 Sensing 2: composites as stain sensors	1311 Structural power 3: device assembly	1312 Non-destructive evaluation	1313 Recycling and sustainability	1314 Tsai award presentations	1315 Joints
1630-1650	1301-1 ADVANCED POLYMERIC NANOCOMPOSITES WITH FUNCTIONALIZED GRAPHENE ANALOGUES OF MOS2 <i>Moitaba Ahmadi, Deakin University</i>	1302-1 THEORETICAL PREDICTION OF BRITTLE- TO-DUCTILE TRANSITION OF BIO-INSPIRED NACREOUS COMPOSITES <i>Shaokang Cui, Beihang University</i> The mechanical behaviors of nacre-like composites are evaluated by a combination of analytical solution and numerical simulation through the modification of the classic tension-shear chain(TSC) model.	1303-1 HIERARCHICAL MODIFICATION OF FLAX FIBRES BY ZINC OXIDE NANOSTRUCTURES <i>Francesca Sbardella, University of Rome "sapienza"</i> Surface modification of the flax fibres with zinc oxides nanorods via hydrothermal synthesis.	1304-1 DESIGN, FABRICATION AND PRELIMINARY EXPERIMENTATION OF A MULTISTABLE KIRIGAMI STRUCTURE <i>Oliver Myers, Clemson University</i>	1305-1 USE OF IN-PROCESS MONITORING AND NDT TO DETECT DEFECTS IN THERMOPLASTIC AFP PARTS <i>Ashley Chadwick, German Aerospace Center (DLR)</i> A combination of in-process monitoring and ultrasound scanning is used to identify defects in a thermoplastic composite laminate produced using automated fibre placement.	1306-1 TEST VALIDATION OF EXTENSION-TWISTING COUPLED LAMINATES WITH MATCHED ORTHOTROPIC STIFFNESS <i>Rizwan Saeed, Choudhry, University of Derby</i> An experimental validation study is presented for three classes of coupled laminate with matching Extension-Twisting coupling. The designs also have matching orthotropic stiffness in extension and bending, which have been chosen specifically to investigate the influence of mechanical Extension-Shearing and/or Bending-Twisting on the performance of Extension-Twisting coupled designs under axial tension loads.	1307-1 A NOVEL APPROACH FOR MODELLING OF ROS AND ROS-HYBRID COMPOSITES <i>Rizwan Saeed, Choudhry, University of Derby</i> A new approach for parametric model generation of discontinuous fibre composites (DFC) that achieves a realistic non-overlapping architecture of Random, Aligned, Tailored and Hybrid DFC for given volume fraction.		1308-1 TENSILE BEHAVIOUR OF THIN-PLY COMPOSITES <i>Haihong Wu, Henan University of Technology</i>	1309-1 MECHANICAL PROPERTIES OF GRAPHENE NANO- PLATELETS COATED CARBON FIBER EPOXY COMPOSITES <i>Alok Kumar.Srivastava, Indian Institute of Technology Bombay</i> The flexural strength of the carbon fiber epoxy based laminates has been found to improve significantly with GNP addition using the spray coating method.	1310-1 STUDY ON THE CORE-SHELL STRUCTURED FIBER TYPE STRAIN SENSOR WITH LOAD BEARING CHARACTERISTICS IN COMPOSITE STRUCTURES <i>Seung Yoon Oh, Korea Advanced Institute of Science and Technology</i>	1311-1 MANGANESE DIOXIDE DECORATED CARBON AEROGEL/ CARBON FIBRE COMPOSITE AS A PROMISING ELECTRODE FOR STRUCTURAL SUPERCAPACITORS <i>Evgeny Senokos, Imperial College London</i> Manganese dioxide electrochemically deposited onto carbon aerogel/carbon fibres (CAG/CF) provides a large enhancement in capacitive performance of the carbon electrodes and show a great potential for multifunctional structural supercapacitors.	1312-1 3D CHARACTERISATION OF CARBON FIBRE REINFORCED COMPOSITE MICROSTRUCTURE VIA X-RAY COMPUTED TOMOGRAPHY <i>Silvano Sommacal, The Australian National University</i> State-of-art 3D X-ray micro computed tomography, combined with tomographic volume analysis and visualization tools, has been utilized to study a suite of highly different carbon fibre reinforced polymers.	1313-1 IMPORTANCE OF CHEMICAL PRETREATMENT FOR CARBON FIBRE RECYCLED FROM COMPOSITE BY PYROLYSIS <i>Siqi Hao, University of Nottingham Ningbo China</i>	1314-1 TOUGHENING EPOXY SYNTACTIC FOAMS WITH MILLED CARBON FIBRES: MECHANICAL PROPERTIES AND TOUGHENING MECHANISMS <i>Sammy He, Imperial College London</i>	1315-1 STUDY OF ENVIRONMENTAL EFFECTS ON THE COMPOSITE-TO-METAL DOUBLE LAP SHEAR JOINTS <i>Qian Zhang, Hefei University of Technology</i>	



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Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211			Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
1650-1710	1301-2 USE OF GRAPHENE TO REDUCE RESIN CURE SHRINKAGE <i>Wei Siang Sum, PETRONAS Research</i>	1302-2 HYBRID COMPOSITES WITH A CROSSED-LAMELLAR MICROSTRUCTURE FOR STRUCTURAL INTEGRITY <i>Riikka Hästö, Imperial College London</i> We designed new CFRP and hybrid composites with bio-inspired crossed-lamellar microstructures. We demonstrated that these composites preserve their structural integrity up to extremely large deformations and exhibit extensive damage diffusion.	1303-2 BIOCOMPOSITES MANUFACTURED USING WATERASSISTED COMPOUNDING OF COFFEE GROUNDS WITH POLYSTYRENE FOR THERMOFORMING CUPS <i>Daniel Schwendemann, University of Applied Sciences Eastern Switzerland IWK</i> Water-assisted compounding allows a new way of using spend coffee grounds in compounding a polymer/biobased composite material. With the new, more circular compound vending cups are thermoformed.	1304-2 MULTIFUNCTIONAL COMPOSITE HOLOGRAPHIC ANTENNA STRUCTURES <i>Thomas Baum, DST Group</i> This paper presents preliminary work towards developing multi-functional conformal antennas based on new electromagnetic meta-material approaches, specifically holographic antennas based on artificial impedance surfaces (AIS).	1305-2 COMPARISON OF HEAT SOURCES FOR AUTOMATED DRY FIBRE PLACEMENT: XENON FLASHLAMP- VS. INFRARED-HEATING <i>Dominik Deden, German Aerospace Centre Augsburg</i> In this study, a xenon-flashlamp heating system is benchmarked to infrared radiators in terms of peel strength and heat distribution at various lay-down Speeds for dry fibre placement.	1306-2 LAMINATE DESIGN FOR IMPROVED POST-CRITICALLY STABLE PERFORMANCE <i>Christopher York, Singapore Institute of Technology</i> This article discusses laminate performance, relating to pre- and post-critically stable in-plane response, for double angle-ply laminates, which are stiffness matched to equivalent standard symmetric laminate configurations; all with fully uncoupled stiffness properties or with Extension-Shearing coupling.	1307-2 FUTURE MICROBOND TESTING - FINITE ELEMENT SIMULATION OF OPTICAL FIBERS FOR STRAINS <i>Royson Dsouza, Tampere University Finland</i> The paper presents a 3D Finite Element (FE) modeling and simulation of the microbond test with FBG sensors for local strain sensing and improved understanding of the fiber droplet interface.		1308-2 INVESTIGATION ON IMPROVING THE COMPRESSIVE STRENGTH OF THE UNIDIRECTIONAL CARBON FIBER REINFORCED POLYMER COMPOSITE <i>Long Li, Aerospace Research Institute of Materials and Processing Technology</i> Effect of key factors on the compressive properties of unidirectional carbon fiber reinforced polymer is investigated, including the diameter of fibers, Young's modulus of resin and interfacial bonding strength.	1309-2 FIBER/MATRIX INTERFACE: A KEY COMPONENT IN A SELF-REINFORCED POLYPROPYLENE COMPOSITE <i>Amel Terras, IMP INSA Lyon</i> The object of this study is to understand to what extend phenomenons involved in the interface building of a self-reinforced polypropylene composite can be related to its overall mechanical properties.	1310-2 TAILORED ZINC OXIDE INTERPHASE IN CARBON FIBER REINFORCED COMPOSITES ACROSS STRAIN RATES <i>Jalal Nasser, University of Michigan</i> Zinc oxide interphases are used to tailor the interfacial properties of carbon fiber reinforced polymer matrix composites for simultaneously optimal performance in structural and ballistic applications.	1311-2 STRUCTURAL POSITIVE ELECTRODES FOR MULTIFUNCTIONAL COMPOSITE MATERIALS <i>Karl Bouton, KTH Royal Institute of Technology</i> The study aims at developing a coating technique for the making of structural positive electrodes, i.e. Lithium oxide coated-carbon fibres. The subsequent technique consists in a Layer-by-Layer assembly of the lithium oxide particles on the carbon fibres. The deposition process is followed by low-temperature carbonisation.	1312-2 FATIGUE LIFE PROGNOSIS FOR COMPOISTE LAMINATES USING LAMB WAVE VELOCITY <i>Chongcong Tao, Nanjing University of Aeronautics and Astronautics</i> Fatigue life prognosis of composite laminates is realized using Bayesian inference to obtain the distribution of parameters of a velocity degradation model, and laser ultrasonic method for wave velocity extraction.	1313-2 DEVELOPMENT OF A VERSATILE RECYCLED COMPRESSION MouldING COMPOUND MADE FROM UNCURED AEROSPACE PREPREG OFFCUTS <i>Pascal Hubert, McGill University</i> This paper introduces a recycling framework for compression moulding of uncured prepreg offcuts. The processing aspect of the framework is discussed in detail, where thermochemical resin characterization and 1-D flow-compaction trials are used to understand the impact that a resin's processing viscosity has on the nature and magnitude of prepreg flow. A recycling process map is then presented in which flow tailoring and cycle time customization is achieved by increasing the resin's initial degree-of-cure through staging.	1314-2 CHARACTERISING MULTI-DIRECTIONAL LAMINATES SUBJECTED TO TENSION/ COMPRESSION-SHEAR LOADING USING A MODIFIED ARCAN FIXTURE <i>Tobias Laux, University of Southampton</i> An experimental procedure is devised based on a re-designed Modified Arcan Fixture (MAF) to investigate composite laminates subjected to combined tension/ compression-shear loading. Experimental results for three multidirectional, quasi-isotropic carbon/epoxy laminates with different ply thicknesses and fibre orientation angles are presented.	1315-2 SIMULATION OF INDUCTION WELDING PROCESS FOR GLASS FIBER THERMOPLASTIC COMPOSITES IN AEROSPACE APPLICATIONS <i>Martine Dube</i>	
1710-1730	1301-3 TENSILE PROPERTIES OF CRYSTALLINE POLYMER COMPOSITE SYSTEMS FILLED WITH SPHERICAL SILICA NANOPARTICLES HAVING HYDROPHILIC SURFACES <i>Mitsuru Tanahashi, Toyama Prefectural University</i> Tensile properties of the PFA and the PP nano-composites filled with silica nanospheres having untreated hydrophilic surfaces were investigated with a focus on the effects of silica/polymer matrix interfacial debonding.	1302-3 ANALYTIC METHODS TO PREDICT RESIN POCKET GEOMETRY AROUND THE MICROVASCULE IN SELF-HEALING COMPOSITES <i>Yihao Ma, School of Aeronautic Science and Engineering, Beihang University</i> Two analytic methods are developed to predict the resin pocket geometry around the microvasculature in self-healing composites. The bending strain energy is calculated on the fiber scale and layer scale respectively.	1303-3 CORK CORE SANDWICH STRUCTURES: STATIC AND DYNAMIC RESPONSE <i>Claudia Sergi, Sapienza University of Rome</i> Comparison of agglomerated cork and PVC foams mechanical properties and their application in bio-based sandwich structures subjected to impact loading.	1304-3 CHARACTERIZATIONS AND APPLICATIONS OF NONPOSITIVE PARAMETRIC MECHANICAL METAMATERIALS <i>Hang Yang, Harbin Institute of Technology</i> This work expands the multi-functional applications of non-positive parametric mechanical metamaterials(negative/zero Poisson's ratio,negative/zero stiffness) based on the characterizations of their unprecedented mechanical properties	1305-3 EVOLUTION OF CRYTALLINITY WITH MULTIPLE LAMINATION STEPS IN HIGH PERFORMANCE THERMOPLASTIC COMPOSITES BY IN-SITU CONSOLIDATION PROCESS <i>Ingrid Esquerro, FIDAMC</i>	1306-3 ENERGY ABSORPTION OF EXPANDED METAL TUBES UNDER EXPANDING LOAD <i>Guoxing Lu, Swinburne University of Technology</i>	1307-3 CROSS-SECTION ANALYSIS OF TAPERED BEAMS <i>Paola Bertolini, DTU</i> A numerical comparison of the stresses evaluated with both 3D FEA and cross-section analysis highlights how the latter currently lack the capability to correctly recover the stresses in tapered beams.		1308-3 HIGH HEAT RESISTANCE EPOXY-BASED COMPOSITES <i>Swezin Than Tun, Toray Composite Materials America Inc.</i> It is known that epoxy-based composite materials have been limited to service temperatures of below 140°C, forcing the use of high temperature materials like bismaleimide (BMI), PEEK, or polyimide composites. Toray research group has recently developed an epoxy-based resin system which has a glass transition temperature (Tg) of 235°C which will serve to widen the use of epoxy to a higher temperature range.	1309-3 IMPROVING THE INTERFACIAL BONDING STRENGTH OF TI/ CFRP FIBER METAL LAMINATES BY USING MULTI-WALLED CARBON NANOTUBES <i>Hao Wang, NUAA</i> Since the interface is the relatively weak area of fiber metal laminates (FMLs), the reinforcement of metal/resin interface is desired urgently. In this study, a metallic-inorganic-organic system and related equations were developed to describe the interfacial behaviors.	1310-3 HUMAN SKIN-MIMICKING INTEGRATED SENSOR WITH ULTRAHIGH SENSITIVITY FOR MULTIDIRECTIONAL SENSING <i>Haomin Chen, Hong Kong University of Science and Technology</i> Mimicking human skin, a novel multidirectional strain sensor consisting of a PUGA composite and a spinosum-like conductive microstructure is developed for sensing deformation from different directions.	1311-3 MORPHOLOGICAL CONTROL OF STRUCTURAL ELECTROLYTES FOR MULTIFUNCTIONAL COMPOSITES <i>Wen Dong Quan, Durham University, UK</i> An investigation of the penetration depth limits of two active thermographic inspection techniques, flash and sonic thermography, for quantitative sizing of barely visible impact damage in carbon fibre composite subjects.	1312-3 PENETRATION DEPTH LIMITS OF ACTIVE THERMOGRAPHY FOR DETECTION OF IMPACT DAMAGE IN CARBON FIBRE COMPOSITES <i>Kelly Tsoi, Defence Science Technology Group</i>	1313-3 3D PRINTING OF RECYCLED PET POLYMER COMPOSITE INFUSED WITH SUSTAINABLE CARBON <i>Vijaya Rangari, Tuskegee</i>	1314-3 MODELLING THE FRACTURE ENERGY OF POLYMER NANOCOMPOSITES <i>Mukesh Bhasin, RMIT University</i> Mechanistic-based analytical models to predict the mode I interlaminar fracture toughness of carbon nanoparticle reinforced polymer composites are described, and compared to experimental data.	1315-3 INTEGRATED ASSESSMENT OF COMPOSITE TO STEEL JOINTS IN MARINE APPLICATIONS <i>Geir Olafsson, University of Southampton</i>	
1730-1750	1301-4 COMPETITION BETWEEN DIFFERENT TOUGHENING MECHANISMS IN COMPOSITES WITH CARBON NANOTUBE GRAFTED FIBERS <i>Qiang Liu, Department of Materials Engineering, Ku Leuven</i>	1302-4 THE ROLE OF DEFECTS IN 3D PRINTING OF BIO-INSPIRED CELLULAR COMPOSITES <i>Sardar Malek, University of Technology Sydney</i>	1303-4 BLAST RESPONSE OF PANELS CONTAINING SUSTAINABLE MATERIALS <i>Chris von Klemperer, University of Cape Town, Mechanical Engineering</i> Sustainable fibre reinforced epoxy composites containing Jute or Flax reinforcement were exposed to explosive airblast loading and the results compared to glass fibre epoxy panels also exposed to airblast.	1304-4 LOCALISED INKJET PRINTING OF RESIN ADDITIVES FOR SELECTIVE PROPERTY ENHANCEMENT <i>Ian Gent, University of Bristol</i> A customised inkjet printer was designed to deposit resin additives. Open hole test specimens containing thermoplastic particles exhibited a 3.8% increase in failure strength compared to unmodified specimens.	1305-4 DEVELOPMENT OF AUTOMATED DRY FIBRE PLACEMENT FOR HIGH RATE DEPOSITION <i>Anthony Evans, University of Nottingham</i> Investigation and explanation into the development and design of a high-speed automated dry fibre placement machine (ADFP). Presentation focuses on the data acquisition and transfer, Joule heating and temperature control for high heating rates	1306-4 STRUCTURAL RESPONSE OF BALLISTICALLY DAMAGED COMPOSITE HONEYCOMB SANDWICH STRUCTURES <i>Binod Aryal, The University of New South Wales</i>	1307-4 INVESTIGATION OF CORRUGATED LAMINATES SUBJECTED TO TRANSVERSE SHEAR LOADING <i>Daniel Thomas, Filipovic, ETH Zurich</i> The presentation will give insight on the results and the derivation of an efficient finite element model derived for calculating the response of corrugated laminates subjected to transverse shear loading.		1308-4 FILLING MICROTUBULES WITH TRIPHENYL PHOSPHATE FOR FLAME-RETARDING EPOXY COMPOSITES <i>Jun Ma, University of South Australia</i>	1309-4 ENHANCING THE INTERFACIAL ADHESION VIA CHEMICAL GRAFTING MULTILAYER POLYDOPAMINE/GO ON CARBON FIBER SURFACE <i>Qing Wu, Shaanxi University of Science & Technology</i> Nano-structured polyether amine/GO multilayers were attached onto carbon fiber surface by chemical grafting approach, and its effects on interfacial adhesion of composites were investigated.	1310-4 LASER INDUCED FREESTANDING GRAPHENE PAPERS FOR MULTIFUNCTIONAL COMPOSITES <i>Sida Luo, Beihang University</i>	1311-4 DESIGN OF OPTIMISED MULTI-SCALE STRUCTURES FOR MULTIFUNCTIONAL COMPOSITES <i>Chanhui Lee, Imperial College London</i>	1312-4 STACKING SEQUENCE DETERMINATION AND ELASTIC PROPERTIES IDENTIFICATION FOR CFRP LAMINATES USING ULTRASONIC TECHNIQUES <i>Jinling Zhao, School of Mechanical and Power Engineering, Nanjing Tech University</i> Ultrasonic bulk wave technique was used to identify stacking sequences of CFRP, on which basis guided wave approach was further investigated towards stiffness coefficients determination of a single lamina in the structure.	1313-4 VALIDATION AND APPLICATION OF MICRO-CT ANALYSIS FOR RECYCLED CARBON FIBER CARD WEB REINFORCED THERMOPLASTICS <i>Siyi Shao, The University of Tokyo</i> The study proposed a method to evaluate the fiber orientation distribution (FOD) of Carbon Fibre Reinforced Plastics (CFRP) from Micro Computed Tomography (Micro-CT) data.	1314-4 DEFECT CHARACTERIZATION AND MECHANICAL PROPERTIES OF MULTI-LAYER LATTICE STRUCTURE <i>Chuanlei Li, Beijing Institute of Technology</i> A novel modeling has been proposed based on the μ -CT scan reconstruction data to investigate the influence of geometrical defects on the mechanical performance of lattice structure.	1315-4 EXPERIMENTAL STUDY ON THE PERFORMANCE OF HYBRID METAL-COMPOSITE JOINTS AT QUASI-STATIC AND INTERMEDIATE STRAIN RATES <i>Karthik Ramaswamy, University of Limerick</i>	



MONDAY 12 AUGUST																	
Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211			Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
1750-1810	1301-5 CARBON NANOTUBE/ POLYAMIDE 6 NANOCOMPOSITES VIA IN-SITU ANIONIC POLYMERISATION <i>Byron Villacorta, University of Queensland</i>	1302-5 TIGR-NACRE: A NEW DAMAGE-TOLERANT CFRP COMPOSITE <i>John-Alan Pascoe, Imperial College London</i> Ductility and damage diffusion in a CFRP-based composite are possible. We achieve these features by combining a nacre-inspired micro-structure with titanium interlayers.	1303-5 EXPERIMENTAL AND MOLECULAR DYNAMICS STUDIES OF ANTIMICROBIAL ADDITIVE MIGRATION FROM BIOCOMPOSITE PACKAGING <i>Venkata Chevali, University of Southern Queensland</i>	1304-5 MODE I AND MODE II FRACTURE PROPERTIES OF MENDABLE HYBRID 3D WOVEN COMPOSITES <i>Raj Ladani, RMIT University</i>	1305-5 MANUFACTURING STUDY WITH THIN-PLY COMPOSITE PREPREGS IN AUTOMATED FIBER PLACEMENT (AFP) <i>Christopher Hansen, University of Massachusetts Lowell</i> The key material, slitting and spooling, and AFP processing parameters for thin-ply materials are identified and tested to produce consistent and repeatable feed of material through the AFP head.	1306-5 AN INTEGRATED METHODOLOGY FOR FULL-FIELD IMAGING AND NUMERICAL ANALYSIS OF COMPLEX COMPOSITE SUBSTRUCTURES <i>Jack Callaghan, University of Southampton</i>	1307-5 AN ADAPTIVE METHODOLOGY FOR EFFICIENT MODELLING OF ARBITRARY DELAMINATIONS DURING CRASH SIMULATIONS <i>Johannes Främby, Chalmers University of Technology</i>			1308-5 EFFECT OF CNTS CONTENT AS TERTIARY FILLER ON CNTS/XGNP/SG/ EPOXY NANOCOMPOSITES ON THE THROUGH-PLANE CONDUCTIVITY <i>Hendra Suherman, Universitas Bung Hatta</i> Carbon nanotubes (CNTs) have the potential to be used as the third conductive filler due to nano-sized and tube-shaped, so as to fill the gap between the second conductive filler which is larger in size.	1309-5 EFFECT OF CARBOXYL CONTENT ON CRABON FIBER SURFACE ON INTERFACIAL ADHESION OF FIBER/NYLON 6 <i>Tao Zhang, Beihang University</i> This report investigates the effect of surface chemical characteristics of carbon fibers on the interfacial properties of carbon fibers/nylon 6 composites.	1310-5 OPTICAL SENSORY NETWORKS IN SOFT MECHANICAL COMPOSITES <i>Patricia Xu, Cornell University</i> Stretchable optical lightguide networks embedded within 3D printed, soft scaffolds for deformation state sensing of the body using machine learning.	1311-5 POLYMERISED MEDIUM INTERNAL PHASE EMULSIONS AS STRUCTURAL SEPARATORS <i>Natasha Shirshova, Durham University</i>	1312-5 INSEGT FIBRE: A USER-FRIENDLY SOFTWARE FOR INDIVIDUAL FIBRE SEGMENTATION <i>Monica Jane Emerson, Technical University of Denmark</i> Insegt Fibre is a software toolbox for volumetric fibre segmentation. By measuring individual fibres from X-ray tomograms, it enables the characterisation of real composite microstructure and its changes under load.	1313-5 INVESTIGATING THE CONSISTENCY IN PHYSICAL PROPERTIES OF 3D PRINTED RECYCLED CARBON FIBER <i>Peng Hao Wang, Purdue University</i> In this study, a team of Purdue University School of Aviation and Transportation Technology (SATT) faculty and students have teamed up to investigate the consistency in physical properties of 3D printed recycled carbon fiber.		
1810-1830		1302-6 AUTOMATICALLY PROCESSED BIOINSPIRED HIERACHICAL CARBON FIBER COMPOSITES <i>Verónica Rodríguez, FIDAMC</i> One of the main drawbacks of carbon fibre reinforced polymers (CFRPs) is the delamination and catastrophic failure mechanism they present when reaching their mechanical limits. A way of limiting this kind of failure is investigated in this project.	1303-6 MANUFACTURING WOOD PLASTIC COMPOSITE FROM RPET/HDPE/ LDPE/UHMWPE REINFORCED RICE HUSK FIBRE <i>Utai Meekum, School of Design Technology Institute of Engineering, Suranaree University of Technology</i> In order to prevent the thermal degradation of the natural fiber on the manufacturing of wood plastic composite based on rPET/ UHMWPE/HDPE reinforced with rice husk fiber, processing temperature below 230oC was the prime objective.	1304-6 STRUCTURAL HEALTH MONITORING FOR FIBRE REIN-FORCED COMPOSITES PRODUCED BY THE WINDING PROCESS <i>Mario Naumann, Technical University of Chemnitz</i>	1305-6 DATA DRIVEN AUTOMATED LAYUP - ENABLING THE AUTOMATION POTENTIAL <i>Philippe Monnot, National Composites Centre</i>	1306-6 THERMAL DEGRADATION STUDY OF BISMALEIMIDE COMPOSITE <i>Dongbing Geng, Aerospace Research Institute of Materials and Processing Technology</i>				1308-6 HYBRID THERMOSET COMPOSITES FOR IMPROVING FRACTURE TOUGHNESS <i>Kanokporn Tangthana-umrung, The University of Manchester</i> Combining the advantages of the engineering thermoplastic and graphene nanoplatelets to improve fracture toughness of epoxy while maintaining all mechanical and thermal properties of material.	1309-6 DEVELOPMENT OF HIGH-PERFORMANCE TRILAYERED LAALO3/SRTIO3/ LAALO3 HETERO-STRUCTURES FOR ELECTRONIC DEVICES <i>Hailong Hu, The University of New South Wales</i>	1310-6 STRAIN SENSING CAPABILITY OF POLYANILINE-BASED CONDUCTIVE GLASS FIBER REINFORCED COMPOSITE <i>Sukanta Das, The University of Tokyo</i> Polyaniline-based conductive polymer, reinforced with glass fiber has been studied for self-sensing. A four probes electrical resistance measurement technique was adopted to measure the resistance change of composite under loading.			1313-6 THE EFFECT OF FIBRE SURFACE TREATMENTS DURING CFRP PRODUCTION ON THE TENSILE STRENGTH OF RECYCLED CARBON FIBRES <i>Di He, The Australian National University</i> A recycling study on carbon fibre reinforced polymers (CFRPs) found minor impacts of electrochemical oxidation and sizing treatment during CFRP production on the tensile strength of recycled carbon fibres.		
1845-2100	Welcome reception Exhibition hall																


TUESDAY 13 AUGUST																	
Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211			Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
0800-0805	Day 2 Welcome & Announcements																
0805-0850	PLENARY LECTURE: THE STORY OF BIOBASED NANOMATERIALS AND THEIR USE IN COMPOSITE MATERIALS <i>Kristiina Oksman, Lulea University of Technology</i> Plenary 2																
0850-0900	Move to concurrent sessions																
0900-1040	2101 Nano-composites	2102 Renewable carbon	2103 Meta-composite	2104 Design and manufacture for multifunctionality	2105 Advanced manufacturing and automation	2106 Scott White symposium	2107 Computational and finite element methods			2108 Resin and polymers	2109 Green & natural fibre composites	2110 Actuation 1: morphing multifunctional composites	2111 Materials by design	2112 Structural health monitoring	2113 Renewable energy	2114 Durability, creep and aggressive environment	2115 Repair
0900-0930	KEYNOTE 1: NANOCOMPOSITES AND HIERARCHICAL NANOENGINEERED ADVANCED COMPOSITES FOR ENHANCED MECHANICAL AND MULTIFUNCTIONAL PERFORMANCE <i>Brian Wardle, MIT (Plenary 2)</i> KEYNOTE 2: SELF-HEALING FIBRE REINFORCED POLYMER COMPOSITES - A BRISTOL PERSPECTIVE <i>Ian Bond, University of Bristol (Meeting room 210)</i> KEYNOTE 3: VIRTUAL DESIGN OF HIGH-PERFORMANCE DISCONTINUOUS-COMPOSITE STRUCTURES <i>Soraia Pimenta, Imperial College (Meeting room 211)</i> KEYNOTE 4: POLYMER NANOCOMPOSITES UNDERFILL MATERIALS FOR ELECTRONIC PACKAGING <i>Yiu-Wing Mai, University of Sydney (Meeting room 212)</i> KEYNOTE 5: OPPORTUNITIES AND CHALLENGES FOR COMPOSITES IN NEXT GENERATION MULTI-MATERIAL VEHICLES <i>Patrick Blanchard, Ford (Meeting room 213)</i> KEYNOTE 6: ACCELERATED TESTING METHOD FOR DURABILITY OF CFRP <i>Yasushi Miyano, Kanazawa Institute of Technology (Meeting room 219)</i>																
0930-0940	Move to concurrent sessions																
0940-1000	2101-1 SYNERGISTIC EFFECT OF DUAL-SCALE CARBON FILLERS ON SENSITIVITY AND STABILITY OF FLEXIBLE STRAIN SENSORS <i>Fan Zhang, School of Mechanical and Manufacturing Engineering, University of New South Wales</i>	2102-1 FROM NANO TO MICRO: HARDNESS PREDICTION IN BIOCARBON BASED COMPOSITES <i>Oisik Das, Department of Fibre and Polymer Technology, KTH Royal Institute of Technology</i> Using the nanoindentation properties of the constituents, the comprehensive or bulk mechanical properties of the composites were accurately predicted.	2103-1 PORO-ELASTIC ACOUSTIC META MATERIALS WITH IMPROVED SOUND ABSORPTION <i>Chris Fuller, Virginia Tech</i>	2104-1 A STUDY ON THE PREFORM DEFORMATION IN THERMOPLASTIC COMPOSITE OVERMOULDING <i>Mario Adrian Valverde, Bristol Composite Institute (ACCIS)</i> Two experimental setups are used to investigate the compaction behaviour of continuous carbon fibre - Polyphenylene Sulphide (CF-PPS) composites processed via injection overmoulding.	2105-1 ADDITIVE MANUFACTURED ELECTROACTIVE SHAPE MEMORY POLYMER COMPOSITES <i>Irina Garces, University of Alberta</i> Shape Memory Polymer Composites can be used as sensors and actuators. This study explores the manufacturing and development of an electroactive self-sensing SMPC for field applications.	2106-1 MODELING OF A NEW COMPOSITE MANUFACTURING PROCESS BASED ON FRONTAL POLYMERIZATION <i>Philippe Geubelle, University of Illinois at Urbana-Champaign</i>	2107-1 DEVELOPMENT OF A 3D FINITE ELEMENT MODEL OF A QUASI-STATIC INDENTATION TEST IN A TYPE III PRESSURE VESSEL <i>Erick Montes De Oca Valle, University of Southampton</i> A 3D FE model is developed to predict the de-cohesion and the resultant deformation of the aluminium liner of a Type III pressure vessel subjected to a quasi-static indentation test.			2108-1 EXPERIMENTAL STUDY OF THE MECHANICAL AND FLAMMABILITY BEHAVIOUR OF SILICA AND RUBBER NANOCOMPOSITES <i>Alexander Fergusson, Fac Technology</i>	2109-1 MICROSTRUCTURE AND MECHANICAL PROPERTIES OF HEMP ELEMENTARY FIBRES FOR COMPOSITE APPLICATIONS BY MICRO-COMPUTED TOMOGRAPHY AND DIGITAL IMAGE CORRELATION <i>Carlos Fuentes Rojas, KULeuven</i> The non-linear behavior of elementary and technical hemp fibres samples were characterized, by combining standard tensile tests with a detailed full-field strain map at the micro scale during tensile loading.	2110-1 ENABLING BIOMIMETIC MORPHING UAVS <i>Geoffrey Spedding, University of Southern California</i> A practical telescoping wing is combined with bio-inspired body-tail configuration to produce a novel design where tail deployment and configuration come from clutched electrolaminate materials.	2111-1 COUPLED PIE-ZORESISTIVE AND THERMORESISTIVE BEHAVIOR OF CARBON NANOTUBE YARNS AND THEIR THERMOSETTING MONOFILAMENT COMPOSITES <i>Jandro Abot, The Catholic University of America</i> Carbon nanotube yarns are lightweight, strong and electrically conductive fiber-like materials that exhibit outstanding physical properties and can be synthesized continuously. Their coupled piezoresistive response is being investigated for smart materials that could detect damage and measure strain inside polymers and polymeric composites.	2112-1 MEASURED LAMB WAVE RADIATION PATTERNS FROM (011) MN-PMN-PZT RELAXOR FERROELECTRIC DISKS ON A COMPOSITE PLATE <i>Benjamin Vien, Monash University</i>	2113-1 RELIABILITY OF COMPOSITE TIDAL TURBINE BLADES <i>Mael Arhant, Ifremer</i> This paper describes early results from the Realtide H2020 European project which aims to improve the reliability of tidal turbines to generate renewable marine energy. The composite blades are a critical component and a testing campaign has been performed to investigate their long term durability. Results are shown for seawater aging and its influence on fatigue performance. These results will be integrated into models of long term behaviour.	2114-1 THIN-PLY EFFECTS ON LONG-TERM THERMAL STABILITY OF HIGH TEMPERATURE POLYIMIDE COMPOSITES <i>Patrik Fernberg, Rise Sicom</i> The paper investigates how the thin-ply effect can play a role for high temperature composites. Mechanical performance in tension as well as long-term thermal stability are considered.	2115-1 ADVANCES IN THE BONDLINE CONTROL TECHNOLOGY FOR THE CERTIFICATION OF ADHESIVELY BONDED COMPOSITE REPAIRS <i>Lennert Heilmann, German Aerospace Center (DLR)</i>
1000-1020	2101-2 DESIGN, STRUCTURATION AND RHEOLOGICAL PROPERTIES OF LAPONITE BASED POLYMERIC NANOCOMPOSITES <i>Omar Abakar Adam, UNABA</i> The best Laponite dispersion was obtained from solution prepared samples regardless of the way of protecting the particles PMMA/PEO blends nanocomposites behave as simple polymer nanocomposites at high concentration of PEO	2102-2 ELECTRICAL AND NANOSTRUCTURAL STUDIES OF RENEWABLE CARBON <i>Maria Semenjuk, University of Toronto</i>	2103-2 AN ELECTRICALLY PROGRAMED ELASTIC METASURFACE FOR TOTAL WAVE MODE CONVERSIONS <i>Guoliang Huang, University of Missouri</i>	2104-2 LAYUP OPTIMIZATION AND WAYS TO IMPROVE THE MANUFACTURABILITY OF COUPLED COMPOSITES <i>Bruno Vermes, Budapest University of Technology and Economics</i> We introduce and validate a layup optimization process for coupled composites by presenting a case study. Also, we propose methods to mitigate the thermal warping of composites with non-symmetric layups.	2105-2 INFLUENCE OF CONTACTING, MATERIAL AND SHAPE ON THE RESISTANCE HEATING OF CONTINUOUS FIBER REINFORCED THERMOPLASTICS <i>Jochen Wellekötter, Institut Für Kunststofftechnik, Universität Stuttgart</i> The effect of Joule heating is used to heat carbon fiber reinforced thermoplastics. High heating rates with low energy consumption are achieved. Correlations between influencing parameters are investigated and specified. Heating experiments are compared using a thermographic image system.	2106-2 MICRO-MECHANICAL MODELING OF FLOW THROUGH RANDOMLY PACKED BEDS OF CYLINDERS & SPHERES: DISPERSION, DEFORMATION AND HEAT TRANSFER (PARTLY AS PRESENTED AT A BECKMAN SEMINAR APRIL 2014) <i>Staffan Lundström, Luleå university of technology</i>	2107-2 PREDICTING TRENDS IN STRUCTURAL AND PHYSICAL PROPERTIES OF HYBRID POLYMER COMPOSITES USING MOLECULAR DYNAMICS <i>Krishnamurthy Prasad, Swinburne University</i> Using Molecular Dynamics (MD), LLDPE and pine flour molecules are constructed. Benefits of the combined MD-semi empirical modelling approach for bottom up design is discussed by comparing predicted composite properties with experiment.			2108-2 CURE KINETICS AND SHRINKAGE MEASUREMENTS IN A FAST CURING EPOXY AMINE RESIN SYSTEM <i>Masihullah Jabarulla Khan, Deakin University</i> Cure kinetics, chemical shrinkage along with CTE measurements for a commercially available fast curing epoxy amine resin system have been reported. This work will provide valuable information for calculation of residual stresses occurring in carbon fibre reinforced composites used in dynamic applications.	2109-2 SUSTAINABLE MYCELIMUM-DERIVED CHITINIOUS THIN FILMS <i>Mitchell Jones, RMIT University</i>	2110-2 MORPHING CARBON FIBRE COMPOSITE USING ELECTROCHEMICAL ACTUATION <i>Ross Hamden, KTH Royal Institute of Technology, Sweden</i> A concept for a structural actuation device is presented and modelled. A carbon fibre laminate is shown to be capable of producing significant geometry changes by exploiting lithium-ion intercalation expansions.	2111-2 THE ORGANIC AND INORGANIC HYBRID NANOCOMPOSITE FOR FLEXIBLE UV SENSOR <i>Teahoon Park, Korea Institute of Materials Science</i>	2112-2 A NOVEL HIGH DENSITY PIEZOELECTRIC SENSING CAPABILITY FOR DETECTION OF IMPACTS IN COMPOSITES <i>Cedric Rosalie, Defence Science & Technology Group</i> In this paper, a novel acoustic sensing system suitable for aircraft implementation is presented and used to demonstrate localisation of acoustic emission generated from non-damaging impacts in a composite panel.	2113-2 REACTIVE THERMO-PLASTIC RESIN AS A MATRIX FOR LAMINATES CONTAINING MICROENCAPSULATED PHASE CHANGE MATERIALS <i>Giulia Fredi, University of Trento</i>	2114-2 ENVIRONMENTAL EFFECTS ON BOLTED COMPOSITE JOINTS SUBJECTED TO PRELOAD <i>Ivanna Pivdiablyk, Ecole Centrale De Nantes</i>	2115-2 RESIN-INJECTION REPAIR OF BARELY VISIBLE IMPACT DAMAGE ON CARBON FIBRE COMPOSITE LAMINATES <i>Wei Liang Lai, Newcastle University in Singapore</i> A systematic approach employed to investigate how vacuum-assisted resin-injection repair method could restore the mechanical integrity of the barely visible impact damage on carbon fibre composite laminates.
1020-1040	2101-3 EFFECT OF SURFACE FUNCTIONALIZATION OF GRAPHENE PARTICLES ON THE PROPERTIES OF NANOCOMPOSITES <i>Annika Catherine Ackermann, University of Stuttgart, Institute of Aircraft Design</i> The effect of plasma treatment of graphene particles was evaluated with respect to the characteristics of the used powder material as well as the processability of the produced nanocomposites.	2102-3 LIGNIN SPINNING AND CARBONIZATION TO NANO-LAYERED GRAPHITIC STRUCTURE <i>Mohini Sain, University of Toronto</i>	2103-3 ASYMMETRIC ELASTIC-WAVE TRANSMISSION IN METACOMPOSITE STRUCTURES <i>Bing Li, School of Aeronautics, Northwestern Polytechnical University</i>	2104-3 THERMALLY ASSISTED PIERCING; MANUFACTURE AND PROPERTIES OF MULTIPLY-PIERCED COMPOSITE <i>Faranak Eghtesadi Bahrami, TWI</i> The comparison of the strength for drilled and thermally assisted pierced (TAP) thermoplastic composite, Carbon Fibre/Polyamide-12. The TAP technique has shown improved strength when compared to the conventional drilling technique.	2105-3 INFLUENCE OF POWER ULTRASONIC ON THE IMPREGNATION OF UNIDIRECTIONAL CARBON FIBRES IN CLOSED INJECTION PULTRUSION <i>Frederik Wilhelm, Fraunhofer Research Institution for Casting, Composite and Processing Technology Igcv</i> Implementation of power ultrasonic in the pultrusion process with the aim of improving the impregnation and mechanical properties of the parts.	2106-3 PERSISTENT DESIGN CHALLENGES: COMPATIBLE, SUSTAINABLE AND AFFORDABLE COMPOSITES <i>Ozden Ochao, Texas A&m University</i> Life cycle prediction of multifunctional systems introduces new opportunities to address performance, cost and sustainability with minimum environmental impact. Characterization and modeling consequences will be discussed for hybrid composites.	2107-3 THE 3D PRESSURE-DEPENDENT ELASTO-PLASTIC CONSTITUTIVE MODEL WITHIN TENSION AND COMPRESSION ASYMMETRY AND ITS APPLICATION TO PREDICT LAMINATES' OFF-AXIS LOADING RESPONSES <i>Rui Ren, Nanjing University of Science and Technology</i> A novel elasto-plastic constitutive model incorporating the tension-compression asymmetry and hydrostatic pressure dependence of laminates' yielding behaviors, was developed for fiber-reinforced composite laminates and validated by available test results.				2109-3 INVESTIGATING THE MECHANICAL PROPERTIES OF CELLULOSE AND AMORPHOUS CELLULOSE BY MOLECULAR DYNAMICS SIMULATION <i>Ali Khodayari, Ku Leuven</i>	2110-3 MULTI-FUNCTIONAL SHAPE ADAPTABLE COMPOSITE METAMATERIAL FOR AEROSPACE APPLICATIONS <i>Maria Sakovsky, ETH Zürich</i> A novel single-cure procedure for fabrication of complex assemblies of fiber reinforced polymer shells is proposed. It is applied to mechanical metamaterial capable of achieving 60% global deformation showing the potential for use of such assemblies for stiff yet deformable aerospace structures.	2111-3 CONDUCTIVE NANOCOMPOSITES MANUFACTURED VIA FRONTAL POLYMERIZATION <i>Leon Dean, University of Illinois at Urbana-Champaign</i>	2112-3 MONITORING OF CEMENT HYDRATION USING TERAHERTZ RADIATION <i>Heonsu Kim, Hanyang University</i>	2113-3 CONTROLLED DESIGN OF ROBUST HIERARCHICALLY POROUS AND HOLLOW CARBON FIBRE TEXTILE FOR HIGH-PERFORMANCE FREESTANDING ELECTRODES <i>Quanxiang Li, Deakin University</i> Effect of Moisture Saturation on the Thermal Expansion Coefficient of Composites	2114-3 EFFECT OF MOISTURE SATURATION ON THE THERMAL EXPANSION COEFFICIENT OF COMPOSITES	2115-3 NUMERICAL AND EXPERIMENTAL STUDY OF STRUCTURAL FILM ADHESIVES AND SCARF REPAIR <i>Sridhar Narayanaswamy, Institute of High Performance Computing</i> We present an experimentally validated numerical framework to predict the structural response of repaired scarf joints for varying lay-up and loading conditions.

TUESDAY 13 AUGUST																
Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211		Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
1040-1110	Coffee break Exhibition hall															
1110-1250	2201 Nano-composites	2202 Biocomposites	2203 Meta-composite	2204 Liquid composites moulding	2205 Advanced manufacturing and automation	2206 Scott White symposium	2207 Computational and finite element methods		2208 Self-healing	2209 Fracture and damage	2210 Actuation 2: active composites	2211 Bio-inspiration	2212 Structural health monitoring	2213 Ceramic matrix composites	2214 Durability, creep and aggressive environment	2215 Tribology and wear
1110-1130	2201-1 MECHANICAL PROPERTIES OF PEEK/HALLOYSITE NANOTUBE COMPOSITES AT ELEVATED TEMPERATURES <i>Amar Mohanty, Christoph Callsen, University of Bayreuth, Department of Polymer Engineering</i> Tensile and fatigue crack propagation properties of PEEK/ HNT-nanocomposites have been investigated at different temperatures. A change of the reinforcing mechanisms has been detected when temperatures are near the glass transition.	2202-1 PERCOLATED NETWORK OF BIOCARBON IN A BLEND OF NYLON 6 AND POLYPROPYLENE <i>Amar Mohanty, Bioproducts Discovery & Development Centre, Department of Plant Agriculture, Crop Science Building, University of Guelph</i> Biocarbon was found to be selectively distributed in the nylon-6 phase, in nylon-6/polypropylene blends due to the similarities in polarity. The effects of dispersion and interaction of the biocarbon on thermal-mechanical properties were systematically studied.	2203-1 METACOMPOSITES ENABLED BY FERROMAGNETIC MICROWIRES <i>Yang Luo, Zhejiang University</i>	2204-1 CURING BEHAVIOR OF ENDO-DICYCLOPENTADIENE AND DECELERATOR SOLUTION EFFECTS <i>Sung Woong Choi, Gyeongsang National University</i>	2205-1 INVESTIGATION ON THE MELTING OF THE WELD INTERFACE IN CONTINUOUS ULTRASONIC WELDING OF THERMOPLASTIC COMPOSITES <i>Bram Jongbloed, Delft University of Technology</i> Continuous ultrasonic welding is a new promising high-speed joining technique for thermoplastic composites. This study aims at relating the optimum welding time in static welding to the continuous welding speed.	2206-1 EVOLUTION OF MULTIFUNCTIONAL MICROVASCULAR COMPOSITES <i>Jason Patrick, North Carolina State University</i>	2207-1 NUMERICAL SIMULATION OF CFRP TRANSVERSE FAILURE CONSIDERING NON-LINEAR VISCOELASTIC/ PLASTIC CONSTITUTIVE EQUATION WITH ENTROPY DAMAGE <i>Mio Sato, Tokyo University of Science</i> The proposed model can express the strain behavior of creep and recovery process. In numerical analysis, A FORTRAN program is created to introduce a proposed nonlinear viscoelastic model into matrix resin.		2208-1 INTRALAMINAR TOUGHENED CARBON/EPOXY COMPOSITES EXHIBITING SELF-HEALING CAPABILITIES <i>Everson Kandare, Rmit University</i>	2209-1 NEAR-REAL-TIME OBSERVATION OF DAMAGE EVOLUTION IN BIAXIALLY STRESSED COMPOSITES USING HIGH-RESOLUTION IN SITU X-RAY COMPUTED TOMOGRAPHY <i>Mio French, University of Utah</i> Novel biaxial test method was developed to enablehigh-resolution in situ X-ray CT imaging of tape-laminate composites under complex loading scenarios.	2210-1 PROGRAMMABLE COMPOSITE STRUCTURES FROM LOCAL BISTABILITY <i>Andres Arrieta, Purdue University</i>	2211-1 SACRIFICIAL POLYMERS FOR RAPID MANUFACTURING OF VASCULAR MATERIALS <i>Mayank Garg, University of Illinois Urbana Champaign</i> Conventional vascularization methods for making multifunctional composites are limited by time and energy-intensive processes. Exothermic curing of the host matrix with simultaneous degradation of the sacrificial polymer enables rapid manufacturing of vascular polymers and composites.	2212-1 IN-SITU DEEP LEARNING FOR PREDICTION AND CONTROLS IN SMART COMPOSITES <i>Sarah Aguasvivas, Manzano, University of Colorado Boulder</i> We present novel tools to perform neural network predictions in a composite material with embedded sensors, actuators and computers. We also demonstrate the possibility of making estimations in complex systems where sensor locations are unknown or where dynamic modeling for system identification may be very complex.	2213-1 FINITE ELEMENT SIMULATION ON PREDICTING NONLINEAR MECHANICAL BEHAVIOR OF 3D BRAIDED CERAMIC MATRIX COMPOSITES <i>Xin Jing, Northwestern Polytechnical University</i>	2214-1 HYBRID ENHANCEMENTS INTERFACE AND MATRIX ON FIBRE REINFORCED POLYMER LAMINATES <i>Younghong Tang, Flinders University</i>	2215-1 EXPERIMENTAL AND SIMULATION STUDY ON WEAR PERFORMANCE OF ECO-HYBRID EPOXY COMPOSITE <i>Khaled Eayal Awwad, University of Southern Queensland</i> This study aims to study the influence of Graphene Nanoplatelets and flax fibre on the tribological and mechanical performances of epoxy. In addition to simulation of the adhesive wear process.
1130-1150	2201-2 EFFECT OF CARBON TYPES ON CURE BEHAVIOR, MORPHOLOGY AND MECHANICAL PROPERTY OF NATURAL RUBBER NANOCOMPOSITE FOAM <i>Pollawat Charoeythornkhaihornchai, Materials Engineering, Faculty of Engineering, Burapha University, Thailand</i> Natural rubber nano-composite foam with carbon particles such as carbon black, graphene and multi-walled carbon nanotubes was studied to investigate the relationship between foam formation during decomposition of chemical blowing agent and crosslink reaction of rubber molecules by sulphur.	2202-2 BIOMASS-DERIVED ELECTROSPUN CARBON NANOFIBER NETWORKS FOR HIGH-PERFORMANCE SUPERCAPACITORS <i>Jiayuan Wei, Luleå University of Technology</i> High-performance carbon electrode for supercapacitors derived from renewable lignin were developed. The electrode materials were tested in both conventional two-electrode supercapacitors using liquid electrolyte as well as a solid-state supercapacitor.	2203-2 BROADBAND WAVE POLARIZATION ENGINEERING WITH ANISOTROPIC ELASTIC METAMATERIAL <i>Rui Zhu, Beijing Institute of Technology</i> This presentation presents a design and experimental realization of broadband elastic metamaterial which can achieve complete wave mode separation and conversion as well as unique negative reflection.	2204-2 EFFECT OF WETTABILITY ON MACROVOID FORMATION IN VISCOUS-FLUID IMPREGNATION TO WOVEN FIBER BUNDLES <i>Kota Yoshihara, Tokyo University of Science</i> We investigate Effect of wettability on macrovoid formation in viscous-fluid impregnation to woven fiber bundles in VARTM method by experimental research.	2205-2 PLY CURVING TERMINATION: SUPPRESSING DELAMINATION IN TAPERED COMPOSITES <i>Shu Minakuchi, The University of Tokyo</i> Fiber orientation is locally changed at terminal end of plies to suppress stress concentration at the ply edges. Suppression of delamination in composite ply drop-off and free-edge delamination is successfully demonstrated.	2206-2 MODELING VOID FORMATION AND GROWTH MECHANISMS IN COMPOSITE PROCESSING <i>Suresh Advani, University of Delaware</i> The focus will be on prediction of voids during the co-cure of honeycomb sandwich structures in an autoclave . Process models that describe the face sheet consolidation, adhesive bond line fillet formation and bond line porosity during the co-cure process will be presented.	2207-2 SIMULATION OF PROGRESIVE DAMAGE IN OPEN-HOLE COMPOSITE SPECIMENS: NUMERICAL INVESTIGATION <i>Ofir Shor, Rafael Advanced Defense Systems Ltd</i> The tensile response of [0/45/90/-45]2s and [30/60/90/-60/-30]2s IM7/977-3 carbon/epoxy open-hole coupons is simulated using two numerical approaches.		2208-2 A FACILE STRATEGY TO FABRICATE SMART COATING WITH SELF-HEALING AND SELF-REPORTING DUAL FUNCTIONS <i>Shusheng Chen, The Hong Kong University of Science</i> Base on hexamethylene diisocyanate and aggregation-induced emission luminogens, we developed a facile strategy, one-part microcapsules embedded approach, to fabricate a smart coating with autonomous self-healing and self-reporting dual functions.	2209-2 EFFECT OF RGO COATING ON NANOSCRATCH BEHAVIOR OF SILVER NANOWIRE NETWORKS <i>Byungil Hwang, Chung-ang University</i>	2210-2 DIELECTRIC ELASTOMER SOFT ROBOTICS <i>Liwu Liu, Harbin Institute of Technology</i>	2211-2 BIO-INSPIRED SYNTHESIS OF MULTIFUNCTIONAL COMPOSITES WITH SELF-ADAPTABLE MECHANICAL PROPERTIES AND SELF-REGENERATION <i>Sung Kang, Johns Hopkins University</i> We report a multifunctional composite inspired bone and coral reef that can adapt its mechanical properties depending on the loading condition and repair damages.	2212-2 A VIBRATION-BASED STRUCTURAL HEALTH MONITORING SYSTEM FOR GFRP LAMINATE STRUCTURES <i>Ahmed Shihab Ahmed Al-saadi, The University of Chester</i>	2213-2 PROPERTIES OF POROUS YTTRIA STABILIZED ZIRCONIA IMPREGRATING WITH SILICA AEROGELS <i>Xiaoyan Wang, Aerospace Research Institute of Material & Processing Technology</i> Properties of porous yttria stabilized zirconia impregrating with silica aerogels were studied. It is found that the thermal conductivity was lowered and the compressive strength was increased after impregnating of silica aerogels.	2214-2 LARGE DEFORMATION BENDING RELAXATION OF THIN-PLY COMPOSITE LAMINATES <i>Juan Fernandez, NASA Langley Research Center</i> A two-step homogenization process was employed to study the ABD stiffness relaxation of thin laminates of interest to NASA for deployable space structure applications and compared to the uniaxial test data produced. The test and viscoelastic models developed will help study the fold-stow-unfold-recovery cycle of these flexible thin-shell structures to increase reliably and long-term behavior prediction in the operational environment.	2215-2 TRIBOLOGY PROPERTY AND ELECTRICAL RESISTIVITY OF C/C COMPOSITES WITH BACTERIAL CELLULOSE <i>Yoshihito Ozawa, Fukushima University</i>
1150-1210	2201-3 RE-FREE EXCHANGE COUPLED NANOCOMPOSITE MAGNETS <i>Ovidiu Crisan, National Institute for Materials Physics</i>	2202-3 THE INFLUENCES OF PARTICLE SIZES ON PERFORMANCE OF BIODEGRADABLE WOOD PLASTIC COMPOSITES MANUFACTURED FROM LINGO-CELLULOSIC AGRICULTURAL WASTE <i>Tung Nguyen, The University of Queensland</i> The objective of this research was to evaluate the effects of opening particle sizes and particle load on the performance of wood plastic composites made from entire cotton stalks with Biodegradable polyhydroxyalkanoates (PHA)	2203-3 FABRICATION AND MECHANICAL PROPERTIES OF CARBON FIBER REINFORCED 3D AUXETIC CELLULAR STRUCTURES <i>Li Ma, Harbin Institute of Technology</i>	2204-3 A NEW SCALABLE METHODOLOGY TO PREDICT PERMEABILITY OF DEFORMED TEXTILES UNDER COMPRESSION <i>Simone Bancora, Ecole Centrale Nantes - Gem</i> We propose a new method for the mesoscale reconstruction of a textile geometry based on simple visual and mechanical data acquisition by means of a pressure-sensitive film.	2205-3 EFFECTS OF ENVIRONMENTAL CONDITIONS ON DEFECT FORMATION DURING AUTOCLAVE PROCESSING <i>Christian Netzel, Center for Advanced Composite Materials</i> This paper investigates the effect of relative humidity and temperature on uncured prepreg characteristics, that are linked to the consolidation quality of L-shaped parts during autoclave processing.	2206-3 LCM PROCESSING OF SELF-HEALING FIBER REINFORCED COMPOSITES <i>Veronique Michaud, Epfl</i> This is an overview of our research on self-healing structural long fiber reinforced composites, from early attempts with DCPD-Grubbs capsules, to EPA containing capsules, to recent work on healable composites based on blends.	2207-3 FINITE ELEMENT MODELLING OF UNIT CELLS APPLIED TO PROBLEMS OF FINITE DEFORMATION <i>Elena Sitnikova, University of Nottingham</i> Formulation of UCs previously established for problems involving small strains was adapted and extended to cover cases involving geometric nonlinearity. A major drawback in finite deformation formulation in FE codes have been exposed.		2208-3 FRACTURE PROPERTIES OF MENDABLE Z-PINNED COMPOSITES <i>Thomas Loh, RMIT University</i>	2209-3 DAMAGE CHARACTERISATION IN TEXTILE COMPOSITES: A COMPARISON BETWEEN NEUTRON AND X-RAY TOMOGRAPHY <i>Garth Pearce, UNSW Sydney</i>	2210-3 3D PRINTING OF LIQUID CRYSTAL ELASTOMERS AS SOFT ACTUATORS FOR MULTIFUNCTIONAL DEVICES <i>H. Jerry Qi, Georgia Tech</i>	2211-3 SELF-HEALING CFRP COMPOSITES WITH HIGH THERMAL STABILITY <i>Henry Sodano, University of Michigan</i>	2212-3 IN-SITU MONITORING OF BRAIDED COMPOSITE TUBES WITH OPTICAL FIBRES AND PIEZOELECTRIC SENSORS <i>Neha Chandarana, The University of Manchester</i> In this work, an optical fibre based strain sensor is integrated between the plies of a braided composite tube. This enables strain monitoring during braiding, resin infusion, and curing. Following manufacture, flexural loading is completed.	2213-3 BRITTLE FAILURE ANALYSIS OF UNI-DIRECTIONAL CERAMIC MATRIX COMPOSITE PLIES UNDER TRANSVERSE TENSILE LOAD: A COMPUTATIONAL MICROMECHANICS APPROACH <i>Pydi Yeswanth Sai, Indian Institute of Technology, Indore</i>	2214-3 EVALUATION OF CREEP-LESS COMPOSITES USING TG-LESS EPOXY RESIN AS THE MATRIX <i>Hirofumi Nishida, Kanazawa Institute of Tehnology</i> Our results strongly suggested the possibility of producing a creep-less composite material with good mechanical properties by using Tg-less epoxy resin modified with rubber nano-particle as the matrix.	2215-3 TRIBOLOGICAL PROPERTIES AND CORROSION RESISTANCE OF NANODIAMOND REINFORCED COMPOSITE COATINGS ON NITI ALLOYS <i>Huimin Zhou, Harbin Engineering University</i> The co-deposited ND led to the changes in the composition and structure of Ni-P/ND composite coatings, contributing to the increase of the microhardness and corrosion resistance of Ni-P/ND nanocomposite coatings.

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Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211			Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
1210-1230	2201-4 STRENGTHEND AND TOUGHENED EPOXY NANOCOMPOSITES <i>Hongbo Gu, Tongji University</i>		2203-4 MECHANICAL PROPERTIES OF 3D CROSS CHIRAL STRUCTURES VIA SELECTED LASER SINTERING <i>Qingsong Wang, Beihang University</i> The Compressive mechanical properties of 3D cross chiral structures are investigated with the help of experiments, numerical simulations and theoretical analysis.	2204-4 EXPERIMENTAL DESCRIPTION OF DRAPING EFFECTS AND THEIR INFLUENCE ON STRUCTURAL BEHAVIOR OF FIBER REINFORCED COMPOSITES <i>Eckart Kunze, Technische Universität Dresden - Institute of Lightweight Engineering and Polymer Technology</i> Comparison of experimentally determined draping effects (fiber waviness and transverse compression) shows good agreement with draping simulation. Structural simulation results of specimen with waviness confirmed observed failure during mechanical testing.	2205-4 DAMAGE TO CARBON FIBRES DURING RADIAL BRAIDING <i>Jacquelynn Xue Ting Tian, RMIT University</i> We investigated the effects of the automated radial braiding process on the damage, shape, tensile strength and stiffness of carbon fibre tows.	2206-4 SIMULTANEOUS IMPROVEMENTS OF STRENGTH AND TOUGHNESS IN TOPOLOGICALLY INTERLOCKED CERAMICS <i>Mohammad Mirkhalaf, The University of Sydney</i>	2207-4 A FINITE ELEMENT MODEL FOR DISCONTINUOUS AND RANDOMLY-ORIENTED STRAND THERMOPLASTIC CFRP <i>Takuya Sumiyama, Research Center, TOYOBO CO., LTD.</i> The objective of this study is to propose a simple finite element (FE) model without consideration of the shape of strands explicitly. As the results of FE analysis, the mechanical flexural behavior agreed well with experimental results for a variety of specimen.			2208-4 SOL-GEL VAPOR MODIFICATION TO DEVELOP DURABLE SUPERHYDROPHOBIC MICRO-CAPSULES FOR SELF-CLEANING APPLICATION <i>Wenjun Luo, The Hong Kong University of Science and Technology</i> A well-established approach to achieve the long-lasting self-cleaning performance in synthetic coating material is the incorporation of polymer-based microcapsules (MCs) with double-layered shells that contain a hydrophobicity agent into the polymer matrix.	2209-4 AN ENERGY-RATE-APPROACH FOR OPTIMIZED FREQUENCY SELECTION FOR REPRODUCIBLE FATIGUE ASSESSMENT OF COMPOSITES <i>Daniel Hülsbusch, TU Dortmund University, Department of Materials Test Engineering (WPT)</i>	2210-4 4D PRINTING OF MULTIFUNCTIONAL MATERIALS <i>Sampada Bodkhe, ETH Zurich</i> 3D printing serves as an essential tool towards fabricating customized implants catering to individual needs. Where implant materials must conform to stringent compatibility norms, adding a different material for each function entails cumbersome and expensive testing, and at the same time increase the risk and discomfort to the user.	2211-4 TOWARDS SELF-HEALING AND SELF-SENSING USING OPTICAL WAVEGUIDES IN MICROVASCULAR COMPOSITES <i>William Martin, North Carolina State University</i>	2212-4 A LOW-COST FLOW FRONT MONITORING SYSTEM <i>Andreas Damm, Robert Bosch GmbH</i> In this work, a MEMS sensor network is embedded in a textile to detect the flow front of a resin transfer molding process. Both acceleration and temperature data is validated and afterwards applied to an existing setup.	2213-4 MULTISCALE 3D INVESTIGATION OF DAMAGE IN ANGLE-INTERLOCKED CERAMIC MATRIX COMPOSITE UNDER IN SITU LOADING <i>Hrishikesh Bale, Carl Zeiss Microscopy Inc.</i> We present here, in-situ tensile test results collected on a laboratory x-ray microscope which demonstrate the advantages and capabilities of non-destructive testing of CMCs. Comparing consecutive 3D volumes from the in-situ test using digital volume correlation, local strain fields can be evaluated in 3D.	2214-4 LONG FIBER SPRAY-UP MOLDING OPTIMIZATION OF CHOPPED GLASS FIBER REINFORCED POLYDICYCLOPENTADIENE COMPOSITES <i>Ji Ho Jeon, Seoul National University</i> Using Long Fiber Spray-up molding process to fabricate chopped GF/p-DCPD composites	
1230-1250	2201-5 EFFECT OF CARBON NANOTUBE BULK MORPHOLOGY ON THE INTERLAMINAR FRACTURE TOUGHNESS OF CFRP LAMINATES <i>Stephen C. Hawkins, Queen's University Belfast</i>		2203-5 CRYOGENIC IMPACT PROPERTIES OF GLASS REINFORCED POLY-DICYCLOPENTADIENE COMPOSITES <i>Jongmin Choi, Pusan National University</i> Performance evaluation of pDCPD impact property at cryogenic temperature and effect of decelator amount		2205-5 HIGH QUALITY AUTOMATED HONEYCOMB POTTING WITH ACTIVE PRESSURE CONTROL <i>Martin Harnisch, Hamburg University of Technology</i> This work compares two control concepts for automated honeycomb potting with regard to quality, repeatability and stability. Potting pressure has been found to be the key target value.		2207-5 A DYNAMIC SPRING ELEMENT MODEL FOR THE PREDICTION OF LONGITUDINAL FAILURE OF POLYMER COMPOSITES <i>Rodrigo Tavares, Faculty of Engineering of University of Porto</i> A dynamic spring element model is used to study tensile failure in polymer composites and understand the fibre clustering process and the damage mechanisms driving failure.			2208-5 NOVEL CYCLIC OLEFIN COPOLYMER/ EPOXY BLEND FOR THERMAL MENDING OF EPOXY IN CARBON FIBER REINFORCED COMPOSITES <i>Haroon Mahmood, University of Trento</i>	2209-5 AN ADAPTIVE DISCRETE-SMEARED CRACK (A-DISC) MODEL <i>Tong-Earn Tay, National University of Singapore</i>	2210-5 GRADIENT MATERIALS INTERFACE FOR HIGH-TEMP SENSOR MODULES <i>Ajit Roy, U. S. Air Force Research Laboratory</i>		2212-5 CHARACTERISATION OF FIBRE REINFORCED COMPOSITES USING HIGH RESOLUTION DISTRIBUTED FIBRE OPTIC SENSORS <i>Claire Davis, Defence Science and Technology Group</i> This paper describes an experimental investigation into the use of continuous fibre gratings to detect and characterise material inhomogeneity and damage in a range of fibre reinforced composite specimens.	2213-5 ACCOUNTING FOR FRICTION IN CRACKS UNDER COMPRESSION AND SHEAR IN AN ANISOTROPIC DAMAGE MODEL AND APPLICATION TO CMCS <i>Emmanuel Baranger, LMT, ENS Paris-saclay, CNRS, Université Paris-saclay</i> An extension of an anisotropic damage theory is proposed for CMCs. Several complex mechanisms related to cracking are described: crack closure, friction, a priori unknown damage directions, non-proportional loadings.	2214-5 FIRE AND POST FIRE PROPERTIES OF GLASS FIBER REINFORCED EPOXY AND POLYCARBONATE COMPOSITE: A COMPARATIVE STUDY <i>Yousof Ghazzawi, University of Queensland</i>	
1250-1350	Lunch Exhibition hall																
1300-1345	DMTC lunch symposium - The potential for composite materials to achieve technology breakthroughs across the Australian defence sector and its industrial supply chains. <i>Martin Veidt, DMTC Program Leader and Associate Professor from the School of Mechanical and Mining Engineering at the University of Queensland</i> Plenary 2																
1350-1435	PLENARY LECTURE: SHAPE MEMORY POLYMER COMPOSITES AND 4D PRINTING TECHNOLOGIES: FROM THE AEROSPACE TO BIOMEDICAL APPLICATIONS <i>Jinsong Leng, Harbin Institute of Technology</i> Plenary 2																
1435-1445	Move to concurrent sessions																
1445-1535	P2301 Ceramic and polymer matrix composites	P2302 Damage tolerance durability, creep and aggressive environment	P2303 Sandwich structures and materials	P2304 Design and manufacture for multifunctionality and machining of composites	P2305 Energy harvesting and storage	P2306 Fracture and damage	P2307 Joints			P2308 Composite structures	Altair industry session	P2310 Civil engineering and composite materials: route to impact	P2311 Non-destructive evaluation	P2312 Textile-based composites	P2313 Smart composite structures	P2314 Dynamic properties & fracture	Fill Gesellschaft industry session
1445-1450	P2301-1 RESEARCH ON WAVES DEFECTS OF TAPE WINDING RESIN MATRIX COMPOSITES <i>Xiaoqing Wang, Aerospace Research Institute of Materials & Processing Technology</i> Decreasing the rate of heating, increasing the temperature of pressured point, and the bandage method without longitudinal fold can reduce waves.	P2302-1 MULTI-MODE VIBRATION DETECTION FOR DELAMINATION OF CARBON FIBRE COMPOSITE PLATE <i>Jie Pu, University of Chester</i>	P2303-1 LOW VELOCITY IMPACT RESPONSE OF CORRUGATED CORE SANDWICH PANELS - EFFECT OF IMPACTOR GEOMETRY <i>Jayantha Epaarachchi, University of Southern Queensland</i>	P2304-1 SUPERHYDROPHOBIC COATINGS FOR ENHANCED FIBRE COMPOSITE MATERIALS <i>Puneet Garg, Australian National University</i> Polyurethane poly (methyl methacrylate) interpenetrating polymer network and FSiO2 coatings were used to fabricate superhydrophobic fiber reinforced composites. These fabricated substrates coated with dewetting material showed reduced water absorption as compared to uncoated substrates.	P2305-1 MULTIFUNCTIONAL COMPOSITES FOR ENERGY HARVESTING <i>Xiaoyu Guan, Shinshu University</i> We prepare a multifunctional flexible nanofiber composite which both has piezoelectric and shape memory effect. This is an advantage for applications of energy harvesting in complex structures.	P2306-1 DUCTILE-BRITTLE FRACTURE SIMULATION OF IN-SITU TiB2/AL COMPOSITE <i>Ma Yifan, Northwestern Polytechnical University</i> The microstructural characteristics and fracture mechanisms of in-situ TiB2/2024 composite were studied. The plastic properties of the matrix were obtained by reverse analysis. The damage and fracture behaviors was simulated.	P2307-1 INVESTIGATION OF GEOMETRICAL AND COMPOSITE MATERIAL PARAMETERS FOR TENSION-ABSORBING BOLTED JOINTS <i>Jazib Hassan, University of Limerick</i> Development of a novel composite bolted joint namely, tension-absorbing joint, that enhances the crashworthiness of lightweight transportation structure by avoiding the bolt fracture and allow the extensive crushing of the composite material.			P2308-1 STIFFENED COMPOSITE PARTS BY RESIN INFUSION PROCESS FOR AIRCRAFT APPLICATION <i>Ouyang Chao, Kolan Dacc Composite</i>	Altair industry session RESEARCH MEETS PRACTICE - ALTAIR'S HOLISTIC APPROACH FOR THE COMPOSITE DESIGN, SIMULATION AND OPTIMISATION PROCESS <i>Markku Palanterä, Director of Global Composites Business Development</i> Sponsored by 	P2310-1 BEHAVIOR OF GFRP BARS SUBJECTED TO DYNAMIC LOADING <i>Farid Abed, American University of Sharjah</i> The paper studies the behavior of GFRP bars under impact loading using the drop hammer test. The tests were conducted on GFRP specimens with different diameters at various loading rates.	P2311-1 THERMOELASTIC ASSESSMENT OF COMPOSITE DELAMINATION BUCKLING <i>Cedric Antolis, Rmit University</i> A laminate coupon containing an artificial delamination is subjected to uniaxial compressive loads to induce localised delamination buckling and examined with thermoelastic stress analysis (TSA) using low-cost microbolometer imaging technology.	P2312-1 FATIGUE BEHAVIOR OF UN-NOTCHED AND NOTCHED 3D BRAIDED COMPOSITES <i>Shuangqiang Liang, University of British Columbia</i>	P2313-1 HARMONIC AND TRANSIENT DYNAMIC RESPONSE OF A SMART LAMINATED STEPPED COMPOSITE BEAM <i>Saeed Fazeli, Australian National University</i>	P2314-1 RATE DEPENDENT TENSILE RESPONSE OF A PLAIN WEAVE TEXTILE COMPOSITE <i>Taeaeong Choi, Unist</i> The rate dependent behavior of the polymer and the textile composite has been experimentally studied. From experiment, it is concluded that the rate dependent behavior of the composite material is mainly determined by the matrix material.	Fill Gesellschaft industry session *invitation only event* "4 X 4 STRATEGY" - BASE FOR AUTOMATION IN COMPOSITE MANUFACTURING <i>Wilhelm Rupertsberger</i> Sponsored by  F&F FUTURE

TUESDAY 13 AUGUST																		
Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211			Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219	
1450-1455	<p>P2301-2 PTHALONITRILE MODIFIED MULTI-HYDROXYL PHENOLIC: SYNTHESIS, CURING AND PROPERTIES <i>Shuangshuang Xu, Institute of Aerospace Materials and Processing</i></p> <p>Multi-hydroxyl phenolic with different phthalonitrile substitution degree was prepared. The chemical structure, curing behaviour, processability and thermal stability were studied.</p>	<p>P2302-2 COMPARATIVE STUDY ON THE DAMAGE TOLERANCE OF THERMOSET AND THERMOPLASTIC GLASS FIBER-REINFORCED COMPOSITES <i>Florian Schimmer, Institute for Composite Materials</i></p> <p>This study experimentally compares the damage tolerance of quasi-isotropic GFRP plates with an epoxy and a polyamide 66 matrix under LVI loading respecting different conditioning states before and during impact testing.</p>	<p>P2303-2 NONLINEAR LOW-VELOCITY IMPACT RESPONSE OF SANDWICH BEAMS WITH FUNCTIONALLY GRADED NEGATIVE POISSON'S RATIO HONEYCOMB CORE <i>Chong Li, Shanghai Jiao Tong University</i></p> <p>Results revealed that the NPR core can remarkably reduce the thickness decrease of sandwich beams subjected to out-of-plane impact, and the FG configurations will distinctly influence the impact response.</p>	<p>P2304-2 ELECTRONIC CIRCUITS EMBEDDED INTO COMPOSITE AEROSPACE MATERIALS <i>Greg Beziuk, RMIT University</i></p> <p>This paper presents a concept demonstrator for embedding a complex multi-layer 4-way radio frequency (RF) switching network into an aerospace composite material.</p>	<p>P2305-2 A REVIEW OF MULTIFUNCTIONAL COMPOSITE STRUCTURES WITH EMBEDDED LITHIUM-ION BATTERIES <i>Koranat Pattarakunnnan, RMIT University</i></p>	<p>P2306-2 EVOLUTION OF FRACTURE PARAMETERS OF A CRACK IN A MICROPOLAR ELASTIC SOLID <i>Hongjun Yu, Harbin Institute of Technology</i></p>	<p>P2307-2 MECHANICAL ANALYSIS FOR WELDING TECHNOLOGY OF THERMOSET FRP <i>Masato Honima, Toray Industries, Inc.</i></p> <p>Performed experimental and numerical analysis for a new material and processing concept by the use of Thermoset and Thermoplastic CFRP multi-material for bonded structure.</p>		<p>P2308-2 THE ENERGY-ABSORBING CHARACTERISTICS OF COMPOSITE TUBE-REINFORCED ALUMINUM FOAMS UNDER COMPRESSION <i>Zheng Liu, Nanjing University of Science and Technology</i></p> <p>This paper investigates the energy-absorbing characteristics of aluminum foams containing embedded carbon fibre reinforced epoxy tubes by quasi-static compression tests.</p>	<p>Altair industry session</p> <p>RESEARCH MEETS PRACTICE - ALTAIR'S HOLISTIC APPROACH FOR THE COMPOSITE DESIGN, SIMULATION AND OPTIMISATION PROCESS</p> <p><i>Markku Palanterä, Director of Global Composites Business Development</i></p> <p>Sponsored by</p> 		<p>P2310-2 RESIDUAL BEARING CAPACITY OF RC MEMBER AFTER EXPOSURE TO HIGH TEMPERATURE <i>Lili Bai, Harbin Engineering University</i></p>	<p>P2311-2 AUTOMATED IMAGE ANALYSIS OF ULTRAFAST SYNCHROTRON CT SCANS TO EXPERIMENTALLY CHARACTERISE THE FIBRE BREAK DEVELOPMENT DURING IN-SITU TENSILE TESTS <i>Christian Breite, Department of Materials Engineering, KU Leuven</i></p> <p>By using synchrotron radiation to perform in-situ µCT experiments combined with the InSegt fibre segmentation algorithm novel insight in the 3D micro structure of composites under tensile load has been gained.</p>	<p>P2312-2 IMPACT PROPERTIES OF HELICOIDAL STRUCTURE OF CARBON/EPOXY COMPOSITES <i>Mazhar Peerzada, Swinburne University of Technology</i></p>	<p>P2313-2 PREPARATION AND CHARACTERIZATION OF THE RADIATION CROSSLINKED SHAPE MEMORY EVA/HDPE <i>Wei Liang, Harbin Institute of Technology</i></p> <p>In this paper, HDPE (high density polyethylene) and EVA (ethylene-vinyl acetate) are used as the raw materials to prepare a shape memory polymer and it has great characteristics of shape memory and space gassing performance.</p>	<p>P2314-2 EFFECT OF INTERMEDIATE STRAIN RATES ON SHEAR PLUGGING STRENGTH OF COMPOSITES <i>Santanu Choudhury, Indian Institute of Technology Bombay</i></p> <p>E glass/epoxy and Carbon/epoxy composite laminates were prepared using the VARTM technique and tested in a UTM, at different intermediate strain rates, for their shear plugging strengths.</p>	<p>Fill Gesellschaft industry session</p> <p>*invitation only event*</p> <p>"4 X 4 STRATEGY" - BASE FOR AUTOMATION IN COMPOSITE MANUFACTURING <i>Wilhelm Rupertsberger</i></p> <p>Sponsored by</p> 	<p>CONTINUED</p>
1455-1500	<p>P2301-3 MACROSCOPIC AND MICROSCOPIC PROPERTIES OF FABRIC RUBBER COMPOSITE <i>Xuefeng Yao, Applied Mechanics Laboratory, Department of Engineering Mechanics, Tsinghua University</i></p> <p>Complex fabric rubber composites with high-performance and special material are widely used in aerospace due to their excellent mechanical and sealing properties, which consist of the matrix material with rubber and the reinforcement material with the fabric.</p>	<p>P2302-3 INFLUENCE OF DENT DEFECTS ON THE COMPRESSIVE STRENGTH OF COMPOSITE LAMINATES <i>Yuequan Wang, Nanjing University of Aeronautics and Astronautics</i></p>	<p>P2303-3 DAMAGE PREDICTION IN QUASI-STATICALLY INDENTED SANDWICH COMPOSITE STRUCTURES USING A TWO-REGION PLATE MODEL <i>Abhendra Singh, Baylor University</i></p> <p>A model is developed for predicting indentation depth, diameter and planar delamination area for thin face sheet, honeycomb core sandwich composites subject to quasi-static indentation loading.</p>	<p>P2304-3 MECHANICAL PROPERTY OF A CORE-FILLED CUBIC MODEL CREATED BY 3D PRINTING TECHNIQUE <i>Jeongho Choi, Kyungnam University</i></p> <p>This paper is focus on finding mechanical properties for hyper cubic model made by 3D printing direct metal laser sintering (DMLS) technique. Applied material is AISi10Mg powder type with the DMLS.</p>	<p>P2305-3 ORGANIC FRAMEWORK DERIVED ULTRA-THIN COBALT IRON SULFIDE NANOSHEET ARRAYS FOR HIGH-PERFORMANCE SUPERCAPACITORS <i>Jae Won Lee, Chonbuk National University</i></p> <p>A novel strategy to establish simple and cost-effective ternary metal sulfide-based electrodes for hybrid and portable electronics.</p>	<p>P2306-3 A PRELIMINARY ASSESSMENT OF A NEW XFEM FRAMEWORK FOR PREDICTING COMPLEX FRACTURE <i>Keith Ballard, Afri</i></p>	<p>P2307-3 SILICA DEPOSITION TREATMENT FOR IMPROVING ADHESION PROPERTIES OF ADHESIVE BONDING OR COATING OF AIRCRAFTS <i>Tetsuo Yasuoka, Japan Aerospace Exploration Agency</i></p> <p>The silica deposition treatment realized high adhesion strength for single lap adhesively-bonded joints and coating test pieces comparable to that with conventional treatment.</p>		<p>P2308-3 STUDY ON THE PROPERTY OF LIGHTWEIGHT BUILDING STRUCTURE <i>Comfort Mensah, Harbin Engineering University</i></p>		<p>P2310-3 IMPROVEMENT OF PENETRATION RESISTANCE OF AMINE CURED EPOXY RESIN FOR CONCRETE LINING BY ION EXCHANGE ZEOLITE UNDER SULFURIC ACID <i>Tetsuya Sakai, Nihon University</i></p> <p>In this study, improvement of corrosion resistance of amine cured epoxy resin by zeolite additives under sulfuric acid environment was investigated.</p>	<p>P2311-3 SIMULTANEOUS MULTI-FREQUENCY DIELECTRIC ANALYSIS OF THE POLYMERIZATION PROCESS OF ANIONIC POLYAMIDE 6 <i>Maximilian Eberhardt, Fraunhofer IgcV</i></p> <p>By the use of a new dielectric measurement system it was possible to monitor the curing process of anionic polyamide-6 to so far unprecedented extend.</p>	<p>P2312-3 RECONSTRUCTION OF MESOSCALE TEXTILE COMPOSITES USING MICRO-CT IMAGE & COMPUTER VISION ALGORITHM <i>Congyuan Tao, UNSW Sydney</i></p>	<p>P2313-3 A MORPHING WINGTIP STRUCTURE <i>Jian Sun, Harbin Institute of Technology</i></p> <p>We describe a morphing winglet concept which based on active inflatable honeycombs and Shape Memory Polymer Composite (SMPC) skins in this work.</p>	<p>P2314-3 MODE II INTERLAMINAR FRACTURE BEHAVIOR OF ZANCHOR REINFORCED COMPOSITE LAMINATES UNDER LOW-VELOCITY IMPACT LOADING <i>Wataru Sugimoto, Ritsumeikan University</i></p> <p>In this study, the mode II impact fracture behavior of the Zanchor composites was experimentally studied to determine the effectiveness of the Zanchor reinforcement at high loading rates.</p>			
1500-1505	<p>P2301-4 ELECTRICAL, THERMAL AND MECHANICAL PROPERTIES OF THERMOPLASTIC ELASTOMER COMPOSITES CONTAINING CARBON FILLERS <i>Rajesh Theravalappil, King Fahd University of Petroleum and Minerals</i></p> <p>Soft and conducting composites of ethylene-octene copolymers using carbon fillers were prepared. Electrical/ thermal conductivities and mechanical properties found improved without compromising increasing hardness. They can find applications as pressure/strain sensors.</p>	<p>P2302-4 AN ATOMISTIC STUDY OF CREEP DEFORMATION IN FIBER/MATRIX INTERFACE <i>Lik-ho Tam, Beihang University</i></p>	<p>P2303-4 FLEXURAL BEHAVIOUR OF FOAM CORED SANDWICH STRUCTURES WITH THROUGH-THICKNESS REINFORCEMENTS <i>Ghilane Bragagnolo, University of Surrey</i></p> <p>Experimental and numerical study of sandwich panels with CFRP through-thickness reinforcements under three-point bending. Investigation of failure modes and skin-core debonding propagation.</p>	<p>P2304-4 DESIGN OF FIBER PREFORMS FOR WORLD'S LARGEST FIBERGLASS COMPANY <i>Peng Li, Tongji University</i></p> <p>Based on Bridging Model and classical laminate theory, the predicted values of fiber fabric's properties can agree pretty well with the experimental values.</p>	<p>P2305-4 DEVELOPMENT OF SiC NANO-PARTICLE/MG2Si THERMOELECTRIC COMPOSITES <i>Junki Nakano, Tokyo University of Science</i></p> <p>We fabricated intragranular SiC nano-particle/Mg2Si composites by sintering to improve toughness without reducing thermoelectric properties. As a result, intragranular composites have a positive effect on mechanical and thermoelectric properties.</p>	<p>P2306-4 SIZE EFFECT AND INTRALAMINAR FRACTURE TOUGHNESS OF FIBRE REINFORCED COMPOSITES <i>Giuseppe Catalanotti, Queen's University Belfast</i></p>	<p>P2307-4 AUXILIARY JOINING ELEMENT WITH INTEGRATED PIN STRUCTURES FOR MECHANICAL JOINING OF FIBER-REINFORCED PLASTIC/METAL COMBINATIONS <i>Per Heyser, Paderborn University</i></p> <p>This research project shows the development of a novel auxiliary joining element with integrated pin structures in order to increase the load-bearing capacity of mechanically joined fiber-reinforced plastic/ metal combinations.</p>		<p>P2308-4 EFFECT OF INTERFACE LAYER AND DISLOCATION ON TANDEM HONEYCOMB MECHANICAL PROPERTY <i>Hangqian Weng, Shanghai Jiaotong University</i></p> <p>Research of influence factor of tandem honeycomb compressive property, for example, dislocation, single layer height in double layer tandem honeycomb, and layer number in a specific core height.</p>		<p>P2310-4 AN INTRODUCTION TO SYNTACTIC FOAMS - THREE DIMENSIONAL COMPOSITE NETWORKS <i>Jim Kingston, Matrix Composites and Engineering</i></p> <p>Everything You Always Wanted To Know About Syntactic Foams* (*But Were Afraid To Ask)</p>	<p>P2311-4 EARLY PREDICTION OF CRACK DEVELOPMENT USING DIGITAL IMAGE CORRELATION <i>David Jesson, University of Surrey</i></p>	<p>P2312-4 DEVELOPMENT OF A FAST DRAPING ALGORITHM USING MULTIFACTORIAL LOCAL SHEAR SIMULATIONS <i>Jacob Hoffer, University of Ottawa</i></p>	<p>P2313-4 LASER INDUCED GRAPHENE PAPERS ENABLED FUNCTIONAL COMPOSITES FOR LIQUID MONITORING <i>Yanan Wang, Beihang University</i></p> <p>Laser induced graphene paper based liquid sensor array was applied to monitor the location of composite which is threatened by harmful organic solvents</p>	<p>P2314-4 NUMERICAL SIMULATION OF HAIL IMPACT CHARACTERISTICS OF GLASS FIBER LAMINATES <i>Xiaojun Yan, Harbin Engineering University</i></p>			



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1505-1510	P2301-5 STRUCTURAL COMPOSITE BATTERIES FOR AUTOMOTIVE APPLICATIONS <i>Jaehoon Choi, Deakin University</i>	P2302-5 FUEL EFFECT ON THE TENSILE STRENGTH EVOLUTION OF CARBON FIBERS UNDER DIRECT FLAME ATTACK <i>Pablo Chávez Gómez, Polytechnique Montréal</i> A hybrid tow-based approach involving simultaneous tensile load and open flame attack has been used on PAN-based carbon fibres. The morphology and tensile strength evolution are assessed.	P2303-5 RESPONSE OF AS4/ PEEK COMPOSITE LATTICE STRUCTURES UNDER THE COMPRESSION AND LOW VELOCITY IMPACT LOADING <i>Jiqiang Hu, Harbin Institute of Technology</i> A new fabrication process of AS4/PEEK lattice structure was proposed, and the compression and low velocity impact behaviors of the structure were studied in this work.	P2304-5 STUDY ON THE PROCESS AND PROPERTIES OF CARBON NANOTUBE FILM CURING CARBON FIBER COMPOSITES <i>Zhiwei Liu, Beihang University</i>	P2305-5 VIBRATIONAL ENERGY HARVESTING OF MULTIFUNCTIONAL COMPOSITE BLADE FOR OFFSHORE WIND TURBINE <i>Tao Wen, Chester University</i>	P2306-5 EFFECT OF CARBON NANOTUBE CONTENTS ON FRACTURE PROPERTIES OF THERMALLY DEGRADED NANOCOMPOSITE FILMS VIA THE ESSENTIAL WORK OF FRACTURE TEST <i>Min-Seok Choi, Korea University</i> A final goal of this study is to construct an underbody shield which is essential to protect a battery pack with adequate plastic. As basic research for this study, we investigated the fracture properties of thermally degraded PETG/CNT nanocomposite films with various CNT contents.	P2307-5 A STUDY ON THE FATIGUE CHARACTERISTICS OF SINGLE LAP JOINT BETWEEN CARBON FIBER REINFORCED PLASTIC/CARBON STEEL <i>Byunghyun Kang, Korea University</i> The effect of surface roughness on the fatigue life of carbon steel-CFRP joints was studied. The lower surface roughness increases the fatigue life under the same stress level.		P2308-5 THERMO-MECHANICAL BEHAVIOUR OF MICROWAVE-CURED CARBON NANOTUBES-BASED POLYMER COMPOSITES <i>Gaurav Arora, Indian Institute of Technology (IIT) Mandi</i> The present work investigates the effect of temperature on the elastic modulus and fracture toughness of the microwave-cured carbon nanotubes (CNTs) based polymer composites.	Altair industry session RESEARCH MEETS PRACTICE - ALTAIR'S HOLISTIC APPROACH FOR THE COMPOSITE DESIGN, SIMULATION AND OPTIMISATION PROCESS <i>Markku Palanterä, Director of Global Composites Business Development</i> Sponsored by  <i>CONTINUED</i>	P2310-5 EVALUATION OF THERMOELECTRIC PROPERTIES OF GRAPHENE-ENABLED REINFORCED POLYMER COMPOSITES: A PROFICIENT MOVE TOWARDS ADVANCED STRUCTURAL APPLICATIONS <i>Azadeh Mirabedini, Swinburne University of Technology</i>	P2311-5 FABRICATION AND CHARACTERIZATION OF DISCONTINUITIES IN AIRCRAFT COMPOSITES AS REFERENCE FLAWS FOR GUIDED WAVE BASED ULTRASONIC TESTING <i>Michael Koerdert, Faser-institut Bremen e. V.</i> Methods for preparation and characterization of porosity and delaminations in composites are presented, which can help to realize a mock-up for guided ultrasonic wave testing accepted by the aircraft industry.	P2312-5 NUMERICAL STUDY ON MECHANICAL PROPERTIES INFLUENCING BALLISTIC IMPACT BEHAVIOR OF WOVEN FABRICS USING CONSTANT TOUGHNESS APPROACH <i>Sagar Ingle, IIT Bombay</i> Results indicate that material with low longitudinal modulus and high failure strain is best combination for maximum projectile energy absorption. Also all the woven fabrics under study show increase in energy absorption (decrease in residual velocity) with increase in interlayer coefficient of friction upto certain threshold value after that energy absorption decreases.	P2313-5 ANALYSIS OF INTERFACE STRENGTH AND FAILURE MODE OF INDENTED SMA WIRE COMPOSITES <i>Tongzhou Zhu, Tongji University</i> The interfacial properties of indented SMA wire and resin matrix at room temperature were studied, which provided reference for engineering application.	P2314-5 IMPROVING THE DYNAMIC MATERIAL CHARACTERISATION OF CARBON/EPOXY COMPOSITES AT INTERMEDIATE STRAIN RATES <i>Sanghyun Yoo, German Aerospace Center (DLR)</i> Experimental dynamic investigations of carbon/epoxy composites are performed at intermediate strain rates using an improved load introduction technique in a high-speed servo-hydraulic testing machine.	Fill Gesellschaft industry session *invitation only event* “4 X 4 STRATEGY” - BASE FOR AUTOMATION IN COMPOSITE MANUFACTURING <i>Wilhelm Rupertsberger</i> Sponsored by  <i>CONTINUED</i>
1510-1515	P2301-6 PREPARATION AND MECHANICAL PROPERTIES OF METAL FLAKE PARTICLES/RESIN COMPOSITE <i>Yutaro Sako, Yamagata University</i> A composite of aluminum flakes powder and epoxy resin improved the tensile and bending modulus. It exhibited the reinforcement efficiency factor of 0.36 in tensile modulus.	P2302-6 STATISTICAL LIFE PREDICTION OF UNIDIRECTIONAL CF/PP TAPE UNDER CREEP TENSION LOAD <i>Takeharu Isaki, Mitsui Chemicals Inc</i> This study examines prediction of the statistical life time for newly developed CF/PP UD sheet under creep tension loading.	P2303-6 MODIFIED DCB TESTS FOR MEASURING MODE I FRACTURE TOUGHNESS AT THE INTERFACE OF SANDWICH STRUCTURES <i>Sooyoung Lee, UNIST</i> The standard DCB test is modified to trigger pure Mode I fracture behavior at the skin/core interface of sandwich panels and image analysis is utilized to quantify the interfacial fracture property.	P2304-6 MACHINED SURFACE TOPOGRAPHY ANALYSIS IN ULTRASONIC VIBRATION ASSISTED END GRINDING OF SIC/PAL COMPOSITES <i>Wei Zheng, Aerospace Research Institute of Materials & Processing Technology</i>	P2305-6 SULFIDE COMPOSITE WITH A LARGE SPECIFIC SURFACE AREA FOR HIGH-PERFORMANCE ALL-SOLID-STATE PSEUDOCAPACITORS <i>Sailong Xu, Beijing University of Chemical Technology</i> Large-specific-surface-area NiS2/CoS2/3D graphene is prepared as pseudo-capacitor electrodes, delivers an capacitance of 2451 F g ⁻¹ at 1 A g ⁻¹ . The all-solid-state device achieves a capacitance retention of 97.2% after 5,000 cycles at 20 A g ⁻¹ .	P2306-6 FRACTURE MECHANISM AND STRENGTH PREDICTION OF IN-SITU TiB2/AL COMPOSITE <i>Min'ge Duan, Northwestern Polytechnical University</i> A ductile-brittle damage model is proposed by combining homogenization technique, Statistical damage model and Porous metal plasticity model.	P2307-6 TENSILE PROPERTIES OF STITCHED 3D-WOVEN COMPOSITES/TITANIUM SINGLE-LAP JOINT <i>Yi-rong Lu, Shanghai Jiao Tong University</i> The effect of several stitch parameter on strength of the 3D-woven composites/titanium single-lap joint is presented in this paper. Performance of the sutures was observed during the test to show the failure mechanism.		P2308-6 TTT CURE DIAGRAM FOR AN AMBIENT TEMPERATURE CURING EPOXY-AMINE THERMOSET <i>Shanelle Fernando, University of Queensland</i>		P2310-6 A STUDY ON HEAT TRANSFER EFFECT OF HEAT SINK FOR DIFFERENT COMPOSITE MATERIALS <i>Meehye Oh, Korea Automotive Technology Institute</i>	P2311-6 MEASUREMENT OF MOISTURE DIFFUSION COEFFICIENT OF WOOD USING TERAHERTZ WAVE <i>Gyung-hwan Oh, Hanyang University</i> Moisture diffusion process in balsa wood was investigated through an image using terahertz technique. The relationship between the THz pulse intensity and moisture content was quantitatively defined.	P2312-6 BUCKLING PROPERTY OF PLAIN WEAVE FABRIC COMPOSITE LAMINATE CONSIDERING INTRALAMINAR INHOMOGENEITY <i>Kazushi Sugiyama, Kanazawa Institute of Technology</i> Buckling property of plain weave fabric composite laminate is investigated considering intralaminar inhomogeneity caused by the weave structure of constituent yarns.	P2313-6 MODELLING AN IMPROVED NOL RING TEST USING A REDUCED VOLUME METHOD FOR THE CHARACTERISATION OF COMPOSITE CYLINDERS <i>Martinus Putra Widjaja, Bundesanstalt Für Materialforschung Und -prüfung (bam)</i> The Reduced Volume Method (RVM) has shown that the multiscale fibre break model can be used more efficiently. A comparison has been done to ensure the application of this method.		
1515-1520	P2301-7 HIGH-TEMPERATURE THERMAL AND MECHANICAL PROPERTIES OF AEROGEL/FIBROUS ZIRCONIA CERAMIC COMPOSITES <i>Jingjing Sun, Aerospace Research Institute of Materials & Processing Technology</i> The microstructure, thermal and mechanical properties at high temperatures of the aerogel/fibrous zirconia ceramic composites were investigated. The results showed that after impregnating the aerogel, the thermal properties improved, but the compressive strength at high-temperature decreased.	P2302-7 AN EXTENDED THICKNESS-DEPENDENT MOISTURE ABSORPTION MODEL FOR UNIDIRECTIONAL CARBON/EPOXY COMPOSITES <i>King Jye Wong, Universiti Teknologi Malaysia</i> This study uses a thickness-dependent model to characterise the non-Fickian moisture absorption behaviour of carbon/epoxy composites. The non-Fickian parameters are normalised and fitted.	P2303-7 REPEATED IMPACT RESPONSES OF HONEYCOMB SANDWICH PANELS <i>Yinggang Li, Wuhan University of Technology</i>	P2304-7 EPI-FLUORESCENT MICROSCOPY OF EDGE TRIMMED CARBON FIBRE REINFORCED POLYMER: AN ALTERNATIVE TO CT-SCANNING <i>Sam Ashworth, The University of Sheffield</i> The milling of composites can induce sub-surface damage. A novel metric to measure machining induced defects through epi-fluorescent optical microscopy is presented as an alternative to x-ray computed tomography.	P2305-7 DESIGN AND PRODUCTION OF FILAMENT WOUND SLEEVES FOR HIGH SPEED FLYWHEEL ROTORS <i>Lei Zu, Hefei University of Technology</i> Filament-wound flywheel sleeves were designed using ultra-high fiber tensions. The present research is able to provide a useful tool for production of composite sleeves for high-speed flywheel rotors.	P2306-7 DIC DEFORMATION MEASUREMENT IN CRACKED CFRP CROSS-PLY LAMINATES <i>M.j. Mohammad Fikry, Tokyo University of Science</i> Digital Image Correlation (DIC) method is employed to measure the strain distribution at the macroscopic level during a tensile test, to a cracked CFRP cross-ply laminates.	P2307-7 AXIAL TENSILE ADHESIVELY BONDED PERFORMANCE OF CFRP WOUND COMPOSITE TUBES UNDER ROOM-TEMPERATURE AND LOW-TEMPERATURE CIRCULATION <i>Haibo Luo, Academy of Opto-electronics, Chinese Academy of Sciences</i>		P2308-7 DETERMINATION OF MODE II INTERLAMINAR FRACTURE TOUGHNESS ENHANCEMENT OF UNIDIRECTIONAL CARBON FIBER-REINFORCED MATRIX COMPOSITES WITH GRAPHENE AND MULTI-WALLED CARBON NANOTUBES <i>Nongyue Gao, Northwestern Polytechnical University</i> Carbon fibre-reinforced composites with nano materials, MWCNTs and graphene, which are used as reinforced agent can obtain an obvious fracture toughness enhancement under an optimal adding density of 1.0g/m2.		P2310-7 UNDERSTANDING RESIDUAL STRESS IN RAPIDLY CURED CARBON FIBRE REINFORCED COMPOSITE <i>Saman Ghadi, Deakin University</i> In this research, residual stress in fast-curing carbon fibre composite, which is a major hurdle in the manufacturing process has been investigated by precise measurements of stress-free temperature.	P2311-7 INVESTIGATION OF DELAMINATED COMPOSITES BY DIC AND AE METHODS <i>Hliva Viktor, Department of Polymer Engineering, Budapest University of Technology and Economics</i> The location of the delaminated zone was clearly identified in the strain field and the results correlated well with the AE localization results.	P2312-7 EFFECT OF TACKIFICATION ON IN-PLANE SHEAR BEHAVIOURS OF BIAXIAL WOVEN FABRICS IN BIAS EXTENSION TEST <i>Xiaoran Zhao, Beihang University</i> The in-plane shear behaviours of tackified fabric were investigated thoroughly. Based on experimental and numerical results, a Gradul Deformation Model was proposed.	P2313-7 FABRICATION AND HYDROPHILIC CHARACTERIZATION OF NANOPARTICLES-FILLED POLYMER COMPOSITES <i>Yuki Hanzawa, Graduate School of Organic Materials Science, Yamagata University</i> The hydrophilic property of oxide nanoparticle was evaluated. Increasing amount of SiO2 in PMMA composite improved the hydrophilic property with reducing the contact angle but decreased the transmittance		


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1520-1525	<p>P2301-8 OXIDATION AND INDENTATION RESISTANCE OF CARBON-CARBON COMPOSITE BY SILICON CARBIDE COATING <i>Kee Sung Lee, Kookmin University</i></p> <p>Carbon-carbon composite is desirable for candidate materials of heat insulation and high temperature heater. However, the disadvantage of carbon-carbon composite is low oxidation resistance at high temperature and lower wear resistance. Therefore, this study investigates oxidation and indentation resistance of Cf-C composites to evaluate oxidation indentation resistance.</p>		<p>P2303-8 ADHESION OF DISSIMILAR POLYMER-METAL COMPOSITE MATERIAL BY MECHANICAL INTERLOCKING <i>Harrison Lin, University of Toronto</i></p> <p>Development of a new class of polymer-metal composites with strong interfacial adhesion by mechanical interlocking of polymer matrix with metal micro-pores.</p>		<p>P2305-8 BI-STABLE PIEZOELECTRIC COMPOSITE LAMINATE FOR ENERGY HARVESTING <i>Fuhong Dai, Harbin Institute of Technology</i></p>		<p>P2307-8 EVALUATION METHOD OF JOINING STRENGTH OF CFRTP MANUFCTUED BY HYBRID INJECTION MOLDING PROCESS <i>Fumiya Matsumoto, Kindai University</i></p> <p>In this study, we proposed a evaluation method for the joining strength of hybrid injection molded products using woven CF/PA66 laminates and short CF/PA66, and verified its effectiveness.</p>		<p>P2308-8 STUDY ON TRUSS TYPE SEGMENTAL COMPOSITE STRUCTURE FOR TEMPORARY RESCUE BRIDGE <i>Fang-Yao Yeh, National Center for Research On Earthquake Engineering</i></p> <p>A truss type segmental composite temporary rescue bridge is proposed, and a 50-m span asymmetric self-anchored truss type segmental cable-stayed bridge is designed, and experimentally validated to improve the stiffness of a longer span bridge.</p>	<p>Altair industry session</p> <p>RESEARCH MEETS PRACTICE - ALTAIR'S HOLISTIC APPROACH FOR THE COMPOSITE DESIGN, SIMULATION AND OPTIMISATION PROCESS</p> <p><i>Markku Palanterä, Director of Global Composites Business Development</i></p> <p>Sponsored by</p>  <p>CONTINUED</p>		<p>P2311-8 COMPOSITE PROPERTY DETECTION USING "WEAK" FORMULATION BASED LOCAL SPECIFIC STIFFNESS IDENTIFICATION <i>Chao Zhang, Nanjing University of Aeronautics and Astronautics</i></p> <p>This paper presents a vibration-based local specific stiffness identification method. By using an enhanced "weak" formulation, the accuracy and noise immunity capability is improved.</p>				
1525-1530	<p>P2301-9 SIC/SIC COMPOSITES FABRICATED BY ELECTROPHORETIC DEPOSITION COMBINED WITH POLYMER INFILTRATION AND PYROLYSIS PROCESS <i>Honglei Wang, National University of Defense Technology</i></p> <p>In order to improve the thermal conductivity of SiC/SiC composites fabricated by Polymer Infiltration and Pyrolysis (PIP) process, SiC/SiC composites were fabricated by Electrophoretic Deposition (EPD) combined with PIP process.</p>								<p>P2308-9 PREPARATION OF THE PVDF/ PAR COMPOSITE MATERIALS BY HIGH SHEAR RATE PROCESSING <i>Seung Goo Lee, Chungnam National University</i></p>							
1530-1610	Coffee break Exhibition hall															
1610-1830	2401 Nano-composites	2402 Biocomposites	2403 Smart composites	2404 Modernising composites regulations	2405 Additive manufacturing	2406 Scott White symposium	2407 Computational and finite element methods		2408 Textile-based composites	2409 Fracture and damage	2410 Actuation 3: formation of active composites	2411 Computation and electronics	2412 Structural health monitoring	2413 Ceramic matrix composites	2414 Dynamic properties, fracture and ceramic matrix composites	2415 Metal matrix Composites
1610-1630	<p>2401-1 DEVELOPMENT OF MULTISCALE TOUGHENING TECHNIQUE TO ADDRESS THE MICRO-CRACKING PROBLEM OF COMPOSITES AT CRYOGENIC TEMPERATURE <i>Mohammad Islam, The University of New South Wales</i></p> <p>The interlaminar fracture properties of angle-ply carbon-epoxy and nanosilica-carbon-epoxy laminated composites were investigated at RT and LN2 temperature for addressing microcracking problem of composites for cryogenic applications.</p>	<p>2402-1 DEVELOPMENT OF FIRE RETARDANT PLIES FOR USE IN NATURAL FIBRE COMPOSITE MANUFACTURE <i>Asanka Basnayake, The University of Queensland</i></p> <p>This work investigated the feasibility of manufacturing a fire-retardant natural fibre ply to be used in liquid composite moulding. Using a readily available waste product - sugarcane bagasse, and common fire-retardant compounds, a rudimentary process was used to develop a fire retardant ply. Composite panels made from these plies were characterised using TGA, cone calorimetry, and four-point bending.</p>	<p>2403-1 STRUCTURAL HEALTH MONITORING OF SMART POLYMER-MATRIX COMPOSITE DURING CYCLIC LOADING USING AN IN-SITU PIEZOELECTRIC SENSOR <i>Corentin Tuloup, Université de Technologie de Compiègne - Laboratoire Roberval FRE UTC-CNRS 2012</i></p>	<p>Welcome and introduction of speakers <i>Professor Janice Barton, University of Bristol, UK</i></p> <p>Certification for design: Reshaping the testing pyramid with a composite aero-structures perspective <i>Professor Ole Thomsen, University of Bristol & National Composites Centre, UK</i> <i>Professor Richard Butler, University of Bath, UK</i></p> <p>Composites regulations – a cross sector perspective with examples of current challenges and routes to mitigation <i>Professor Simon Quinn, University of Southampton, UK and member of the Regulations, Codes and Standards working group under the Composite Leadership Forum (CLF), UK</i></p>	<p>2405-1 BIODEGRADABLE SYNTHETIC POLYMER-CERAMIC COMPOSITE MATERIALS VIA VARIOUS ADVANCED MANUFACTURING TECHNIQUES <i>Mona Alizadeh Osgouei, RMIT</i></p>	<p>2406-1 MODELING OF MODULUS EVOLUTION FOR PROCESS SIMULATION <i>Anoush Poursartip, The University of British Columbia</i></p> <p>Thermoset matrices transform from liquid to rubber to solid during processing. Many composites processing simulation researchers have used Young's Modulus and Poisson's Ratio to describe the matrix transformation. Here we argue strongly that the bulk and shear moduli are much appropriate and correct properties to characterize and use.</p>	<p>2407-1 A NUMERICAL MODEL TO SIMULATE THE IMPACT RESPONSE OF FLAX-POLYPROPYLENE COMPOSITES <i>Raj Das, Rmit University</i></p> <p>In this work, comprehensive experimental and numerical studies have been carried out to investigate the impact behaviour of flax fibre-reinforced polypropylene (PP) composites. The impact response predicted by the numerical model agreed well with the experimental and results</p>		<p>2408-1 POISSON RATIO EQUAL TO 12 IN LONGITUDINAL COMPRESSION DURING MESO- FE ANALYSIS OF COMPOSITE TEXTILE REINFORCEMENTS <i>Philippe Boisse, Insa Lyon</i></p>	<p>2409-1 IN-SITU FULL FIELD OUT OF PLANE DISPLACEMENT AND STRAIN MEASUREMENTS AT THE MICRO-SCALE IN SINGLE REINFORCEMENT COMPOSITES UNDER TRANSVERSE LOAD <i>Ilyass Tabiaj, Polytechnique Montréal</i></p> <p>The fiber / matrix inter-facial damage mechanisms of fiber-reinforced composites are investigated for four different composites containing a single fiber or bundle of fibers under transverse load using micro digital image correlation during in-situ quasi-static tests of single-reinforcement dogbone specimens.</p>	<p>2410-1 INSTABILITY-INDUCED PATTERN FORMATION IS SOFT COMPOSITES FOR MECHANICAL METAMATERIALS <i>Stephan Rudykh, University of Wisconsin Madison</i></p>	<p>2411-1 NEUROMORPHIC NETWORK BASED ON CARBON NANOTUBE COMPOSITES FOR LEARNING <i>Yong Chen, University of California Los Angeles</i></p>	<p>2412-1 MONITORING CURE-INDUCED TEMPERATURE AND STRAINS IN LARGE COMPOSITES WITH FBG SENSORS <i>Anxin Ding, Wuhan University of Technology</i></p>	<p>2413-1 PREPARATION AND CHARACTERIZATION OF A TERNARY EUTECTIC AL2O3-ZRO2-Y2O3 CERAMIC COMPOSITE <i>Guoqing Chen, Dalian University of Technology</i></p> <p>This presentation is devoted to investigate the eutectic solidification behavior and microstructural evolution of the Al2O3/ZrO2(Y2O3) pseudo-binary eutectic system.</p>	<p>2414-1 MODELLING OF A POLYMER COMPOSITE TUBE CRUSHING PROCESS UNDER HIGH STRAIN RATE CONDITIONS <i>Sina Eskandari, University of Oxford</i></p> <p>A model for composite materials under high strain rate is developed. It considers viscoelasticity failure and damage. Drop tower tests for tubes are carried out and compared to the simulation.</p>	<p>2415-1 THE STRAIN RATE SENSITIVITY OF AN CNT-REINFORCED AL METAL MATRIX COMPOSITES <i>Jianghua Shen, Northwestern Polytechnical University</i></p>


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Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211			Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
1630-1650	2401-2 FABRICATION OF HIERARCHICAL POLYMER NANOCOMPOSITES WITH CAPILLARY-DENSIFIED ALIGNED CARBON NANOTUBE REINFORCEMENT <i>Ashley Kaiser, Massachusetts Institute of Technology</i> This process-structure study of hierarchical polymer nanocomposites (here millimeter-tall patterned, capillary-densified aligned carbon nanotubes in aerospace-grade epoxy) presents multi-scale structural characterization to investigate high-density nanotube confinement effects on nanotube-polymer interactions.	2402-2 THERMO-HYGRO-MECHANICAL BEHAVIOUR OF NONWOVEN BIOCOMPOSITES UNDER VARIOUS ENVIRONMENTAL CONDITIONS <i>Victor Gager, Univ. Bretagne Sud, UMR CNRS 6027, IRDL</i> This paper presents an experimental and numerical study into the effect of embedding (LiPo) batteries into sandwich panels on the vibration and acoustic properties.	2403-2 VIBRATION AND ACOUSTIC PROPERTIES OF MULTIFUNCTIONAL SANDWICH COMPOSITES WITH EMBEDDED LITHIUM-ION POLYMER BATTERIES <i>Joel Galos, RMIT University</i> This paper presents an experimental and numerical study into the effect of embedding (LiPo) batteries into sandwich panels on the vibration and acoustic properties.	Composites regulations and processes for validation and certification - an industry perspective <i>Dr Matthew Jevons, MT Aerospace AG, Germany</i> Partnership between academia and industry on improving composite regulations and certification processes <i>Dr Enrique Garcia, National Composites Centre, UK</i> Composite regulations - challenges and opportunities <i>Mr Rodney Thomson, Engineering Manager, Advanced Composite Structures Australia Pty Ltd</i>	2405-2 HIGHLY STRETCHABLE 3D-PRINTED COMPOSITE STRUCTURES <i>Hamidreza Yazdani Sarvestani, McGill University & National Research Council Canada</i> This presentation covers select scientific achievements of Prof. Theriault's team mainly on additive manufacturing of multifunctional composites while providing insight into the contributions from and interactions with Prof. White's team.	2406-2 FROM THE MICROFABRICATION OF MICROVASCULAR NETWORKS TO THE ADDITIVE MANUFACTURING OF MULTIFUNCTIONAL COMPOSITES <i>Daniel Theriault, Polytechnique Montréal</i> We developed parallel finite element analysis (FEA) software, that can simulate failure of large-scale CFRP models including interfaces. We validated the software by simulating double cantilever beam (DCB) experiments.			2408-2 NUMERICAL MODELLING OF BIAXIAL CARBON FIBER BRAIDS CONSIDERING PROCESS VARIABILITIES <i>Ruben Czichos, Institute of Aircraft Design, University of Stuttgart</i> Presented is an investigation of the influence of the structural properties of non woven interleaves on the damage resistance and damage toughness of CFRP composites, evaluated through impact and compression tests. Results show that damage resistance increases with the increase of the areal density of the interleaf.	2409-2 THE INFLUENCE OF NONWOVEN INTERLEAF ARCHITECTURES ON THE IMPACT PERFORMANCE OF COMPOSITES <i>Rhys Archer, University of Manchester</i> Presented is an investigation of the influence of the structural properties of non woven interleaves on the damage resistance and damage toughness of CFRP composites, evaluated through impact and compression tests. Results show that damage resistance increases with the increase of the areal density of the interleaf.	2410-2 TUNING MECHANICAL INSTABILITIES IN MAGNETO-ACTIVE ELASTOMER COMPOSITES <i>Abigail Juhl, Air Force Research Laboratory</i> Electronic components including resistors, inductors, capacitors are created using structural polymer nano composites and evaluated.	2411-2 STRUCTURAL ELECTRONIC COMPONENTS BASED ON POLYMER NANOCOMPOSITES <i>Brian Wardle, MIT</i> A new fabrication of freestanding graphene fiber sensors by laser-induced graphene technology was demonstrated. Based on the resistance variation, the embedded graphene fiber sensor demonstrates highly valuable in life-long SHM of composite laminates.	2412-2 LASER-INDUCED GRAPHENE FIBER SENSORS FOR STRUCTURAL HEALTH MONITORING OF POLYMERIC COMPOSITES <i>Meihong He, Beihang University</i> A new fabrication of freestanding graphene fiber sensors by laser-induced graphene technology was demonstrated. Based on the resistance variation, the embedded graphene fiber sensor demonstrates highly valuable in life-long SHM of composite laminates.	2413-2 IMAGING THE LIFE-CYCLE OF CMCS USING HIGH-RESOLUTION X-RAY MICRO-COMPUTED TOMOGRAPHY <i>Peter Creveling, University of Utah</i> This study utilizes X-ray µCT imaging to capture the entire life-cycle of a CMC specimen, from manufacture to ultimate failure. Results will be presented on the methods to image and quantify the evolution of the microstructure throughout the manufacturing process.	2414-2 USING ULTRA-HIGH SPEED IMAGING TO IDENTIFY THE MATERIAL PROPERTIES OF COMPOSITES AT HIGH STRAIN RATES <i>Lloyd Fletcher, University of Southampton</i> Full-field displacement measurements are spatially differentiated to obtain strain fields. Temporal differentiation gives the acceleration fields which are related to the applied load. Combining these measurements gives the material response of the composite.	2415-2 WASTE TO WEALTH: SUPER HARD CARBON MICROTUBE DERIVED FROM COTTON WASTE FOR COMPOSITE APPLICATIONS <i>Kamyar Shirvani Moghaddam, Deakin University</i>	
	1650-1710	2401-3 CAPILLARY-ENHANCED NON-AUTOCLOAVE COMPOSITE MANUFACTURING BASED ON NANOPOROUS NETWORK <i>Jeonyoon Lee, MIT</i> The capillary-driven manufacturing technique presented here enables traditional autoclave-required prepreg to be processed under vacuum-only conditions without an autoclave or any modifications to the prepreg system.	2402-3 ALIGNED POLY(LACTIC ACID)-BASED NANOCOMPOSITES REINFORCED WITH IN-SITU DISPERSED CELLULOSE NANOCRYSTALS <i>Shiyu Geng, Lulea University of Technology</i> The present work reports strong and tough aligned poly(lactic acid)-based nanocomposites with well-dispersed cellulose nanocrystals achieved by the combination of three novel processing methods, i.e. in-situ emulsion polymerization, liquid-assisted extrusion and solid-state drawing.	2403-3 SMART GRAPHENE-ENABLED COMPOSITE <i>Mojdeh Reghat, Swinburne University of Technology</i> Composite structures in high-performance applications are often exposed to damaging external impacts, deformations and changes in environmental conditions during service. Smart structural composites are multifunctional structural materials which are capable of strain, stress, damage or temperature sensing.	<i>This workshop will run for 2 hours between 1600 and 1830</i>	2405-3 DESIGN, MANUFACTURE AND TESTING OF 3D PRINTED CONTINUOUS FIBRE REINFORCED COMPOSITE LUG STRUCTURES <i>Peng Zhuo, University of Nottingham</i> A novel electrophoretic deposition process for creating multifunctional textiles and fibers is introduced. Applications in structural health monitoring and flexible sensors for human motion detection will be discussed.	2406-3 NANO: MULTIFUNCTIONAL FIBERS AND COMPOSITES FROM (ALMOST) NOTHING <i>Erik Thostenson, University of Delaware</i> A novel electrophoretic deposition process for creating multifunctional textiles and fibers is introduced. Applications in structural health monitoring and flexible sensors for human motion detection will be discussed.	2407-3 MULTISCALE DAMAGE SIMULATION OF CFRP UNDER LOW VELOCITY IMPACT <i>Akinori Yoshimura, Nagoya University</i> This paper aims to study the failure strength and failure mode of Fiber Metal Laminates in single-bolted single-lapped joint.	2408-3 HYSTERETIC BEHAVIOUR MODELLING OF WOVEN FABRIC UNDER LARGE STRAIN <i>Yvan Denis, INSA de Lyon</i> PhD student at LaMCoS laboratory in France completing the final year of its studies. Currently working on material behaviour to modelise new composite forming strategy such as incremental processes.	2409-3 FAILURE ANALYSIS OF FIBRE METAL LAMINATE JOINTS <i>Yong Du, Northwestern Polytechnical University</i> This paper aims to study the failure strength and failure mode of Fiber Metal Laminates in single-bolted single-lapped joint.	2410-3 ELASTOMER-GRANULAR FLUID COMPOSITES FOR VARIABLE COMPLIANCE IN ROBOTIC APPLICATIONS <i>Shannon Bakarich, Cornell University</i> Variable stiffness has been successfully demonstrated in elastomer – granular fluid composites. In this research we want to investigate the fluidic nature of these granular materials and consider them as a new medium for transferring force in pneumatic actuators.	2411-3 COMPUTATIONAL MECHANICAL METAMATERIALS <i>Jonathan Hopkins, University of California, Los Angeles (UCLA)</i> The split Hopkinson bar technique is used for high strain rate testing of T800/F3900 composite in compression and tension. Digital image correlation is used for measuring the strain on the surface of the specimen.	2412-3 ULTRASENSITIVE STRAIN SENSORS FOR STRUCTURAL HEALTH MONITORING USING A HIGHLY ALIGNED CARBON NANOTUBE WEB <i>Sandeep Kumar, Queen University Belfast</i> The mechanical performance, the microstructure of multiple ceramic matrix composites were investigated under different conditions relevant to service. Up to the present it was observed that a high degree of variability is found in the microstructure of these systems resulting in high variability of the mechanical properties.	2413-3 MECHANICAL PERFORMANCE, RESIDUAL STRESS AND MICROSTRUCTURAL ANALYSIS OF MULTIPLE CERAMIC MATRIX COMPOSITE SYSTEMS <i>Joachim-Paul Fornas-Kreutzer, University of Bristol</i> The mechanical performance, the microstructure of multiple ceramic matrix composites were investigated under different conditions relevant to service. Up to the present it was observed that a high degree of variability is found in the microstructure of these systems resulting in high variability of the mechanical properties.	2414-3 HIGH STRAIN RATE TESTING OF FIBROUS COMPOSITE USING THE SPLIT HOPKINSON BAR TECHNIQUE WITH DIC <i>Amos Gilat, The Ohio State University</i> The split Hopkinson bar technique is used for high strain rate testing of T800/F3900 composite in compression and tension. Digital image correlation is used for measuring the strain on the surface of the specimen.	2415-3 MANUFACTURING PROCESS OF GRAPHENE REINFORCED AL COMPOSITE AND THEIR PROPERTIES <i>Yongbum Choi, Graduate School of Engineering, Hiroshima University</i>	
1710-1730	2401-4 INTERLAMINAR SHEAR REINFORCEMENT OF UNIDIRECTIONAL AEROSPACE LAMINATES WITH RADIALLY ALIGNED CARBON NANOTUBES <i>Richard Li, Massachusetts Institute of Technology</i> Additives are manufactured using environmentally friendly materials, and the mechanical properties of natural fiber composites are improved by using additives and analyzed by SEM image.	2402-4 THE EFFECT OF SEAWEED ON MECHANICAL PROPERTIES OF JUTE FIBER/VINYL ESTER COMPOSITES <i>Jaechoul Kim, Changwon National University</i> Additives are manufactured using environmentally friendly materials, and the mechanical properties of natural fiber composites are improved by using additives and analyzed by SEM image.	2403-4 DESIGN AND MANUFACTURE OF MULTISCALE CARBON FIBRE REINFORCED POLYMER (CFRP) COMPOSITES FOR MULTIFUNCTIONALITY <i>Raquel Santos, Inegi - Institute of Science and Innovation In Mechanical and Industrial Engineering</i>	2405-4 ENHANCING MECHANICAL PROPERTIES OF 3D PRINTED PARTS BY SPRAYING CELLULOSE NANOCRYSTALS <i>Amir Asadi, Texas A&m University</i> A novel method for enhancing the longevity of dental restorations is developed via sustained delivery of bioactive compounds to the dentin-resin interface using sustained-release polymer microcapsules.	2406-4 TOWARDS SELF-REGULATING DENTAL COMPOSITES <i>Mostafa Yourdkhani, Colorado State University</i> A novel method for enhancing the longevity of dental restorations is developed via sustained delivery of bioactive compounds to the dentin-resin interface using sustained-release polymer microcapsules.	2407-4 NUMERICAL ASSESSMENT OF CAPILLARY PRESSURE BY FLOW SIMULATION IN A FIBROUS MEDIUM <i>Hong Nhan Vo, Ecole Des Mines</i>		2408-4 STUDY ON BIAXIAL AND CYCLIC TENSILE PROPERTIES OF FEVE REINFORCED MEMBRANES <i>Jinhua Jiang, Donghua University</i> Biaxial stress tests of unidirectional CFRP laminates were performed to investigate failure criteria under fiber longitudinal tensile-fiber transverse compressive biaxial stress state.	2409-4 BIAXIAL STRESS TESTS FOR UNIDIRECTIONAL CFRP LAMINATES <i>Keita Goto, Department of Aerospace Engineering, Nagoya University</i> Biaxial stress tests of unidirectional CFRP laminates were performed to investigate failure criteria under fiber longitudinal tensile-fiber transverse compressive biaxial stress state.	2410-4 DEVELOPMENT OF ADAPTIVE FIBER REINFORCED PLASTICS BY OPEN REED WEAVING TECHNOLOGY <i>Moniruddoza Ashir, Technische Universität Dresden</i> An adaptive FRP was developed with shape memory alloy being structurally integrated into reinforcing fabrics using open reed weaving technology. In a subsequent step, the thermomechanical characterization of adaptive FRP was executed.	2411-4 CAPTURING AR-RAYS OF MAGNETIC BEADS USING COMPOSITE HETERO-STRUCTURES WITH PERPENDICULAR MAGNETIC ANISOTROPY (PMA) <i>Christopher Lynch, University of California, Riverside</i>	2412-4 DETECTION OF DIFFERENT MECHANICAL FORCES BY MULTIDIRECTIONAL SENSORS <i>Shuhua Peng, University of New South Wales</i> This study shows a significant pressure influence during curing on the impact strength of epoxy resin and on the mechanical properties of carbon fibre reinforced plastics at high strain rates.	2413-4 MICROSTRUCTURE, MECHANICAL PROPERTIES AND OXIDATION RESISTANCE OF C/C-SIC-ZRB2 COMPOSITES <i>Wenbo Han, Harbin Institute of Technology</i>	2414-4 PRESSURE INFLUENCE DURING CURING ON THE MECHANICAL PROPERTIES OF EPOXY RESIN COMPOSITES AT HIGH STRAIN RATES <i>Mortiz Kurkowski, Chair of Plastics Technology, TU Dortmund University</i> This study shows a significant pressure influence during curing on the impact strength of epoxy resin and on the mechanical properties of carbon fibre reinforced plastics at high strain rates.	2415-4 EFFECTS OF ULTRASONIC TREATMENT ON MICROSTRUCTURE AND MECHANICAL PROPERTIES OF HYBRID PARTICULATES REINFORCED AL-ALLOY MATRIX COMPOSITES <i>Jianyu Li, State Key Lab of Materials Processing and Die & Mould Technology, Huazhong University of Science and Technology, China</i>		



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Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211			Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
1730-1750	2401-5 BATTERY PROTOTYPE WITH A CELL BASED ON CARBON NANOSTRUCTURES <i>Wojciech Ciesielski, Jan Dlugosz University In Czesochowa</i>	2402-5 FIRE PERFORMANCE OF BIOPOLYMERS RECOVERED FROM WASTE AEROBIC GRANULAR SLUDGES <i>Yuemei Lin, Delft University of Technology</i> Both activated sludge and aerobic granular biopolymers showed effective char formation due to their protein and phosphate components. The self-extinguishment of the biopolymer coated flax fabric indicated the fire-resistant behaviour of the biopolymer substance.	2403-5 THE PHYSICAL FIELDS TO MICROHOLES PROBLEM IN FLEXOELECTRIC SOLIDS <i>Xinpeng Tian, Xi'an Jiaotong University</i> In this paper, the complete explicit solution of physical fields to a micro-hole is solved for flexoelectric solids which are more accurate since accounting for the strain gradient, the polarization gradient, the flexoelectric and the reverse flexoelectric effects simultaneously.	<i>Modernising Composites Regulations session continues</i> <i>This workshop will run for 2 hours between 1600 and 1830</i>	2405-5 THERMOGRAPHIC ASSESSMENT OF FIBRE REINFORCED 3D PRINTING FILAMENT <i>Rachael Tighe, University of Waikato</i> Thermography is proposed for the assessment of short fibre reinforced 3D printer filaments to provide quality assurance and reduce the variation of properties and failed prints caused by fibre bunching during manufacture.	2406-5 RECYCLING OF WIND TURBINE BLADES FOR FUSED FILAMENT FABRICATION FEEDSTOCK <i>Larry Lessard, McGill University</i>	2407-5 PREDICTING MULTISCALE FAILURE IN TEXTILE COMPOSITES USING REALISTIC REPRESENTATIVE VOLUME ELEMENTS <i>Nayeem Chowdhury, Boeing R&T - Australia</i> In-Situ testing using non-destructive inspection techniques such as micro-CT and neutron tomography (NT) have assisted in understanding composite failure. However, access to these bits of test equipment have acted as a barrier to furthering research. A means to bridge this gap is presented.		2408-5 EXPERIMENTAL AND NUMERICAL STUDY OF TRIAXIALLY BRAIDED COMPOSITE UNDER QUASI-STATIC AND HIGH SPEED IMPACT LOADINGS <i>Chao Zhang, Northwestern Polytechnical University</i> The multi-scaled mechanical failure behavior of triaxially braided composite under quasi-static and high-speed impact loadings are investigated experimentally and numerically.	2409-5 NUMERICAL STUDY OF THE FORMATION OF LEAKAGE PATHS THROUGH CFRP LAMINATES FOR CRYOGENIC PROPELLANT TANKS <i>Hitoshi Hamori, University of Tokyo</i> In this study, finite element models using experimental material properties are constructed, and the influence of the difference of ambient temperature and the usefulness of thin-ply layers are numerically verified.	2410-5 RAPID DESIGN AND PROTOTYPING OF ADAPTIVE COMPOSITE ARTICULATING CYLINDERS <i>Jeffery Baur, Air Force Research Laboratory</i>	2411-5 MWCNT REINFORCED BIO-BASED BENZOXAZINE/ EPOXY COPOLYMERS WITH NIR ACTUATION CAPABILITY <i>Sarawut Rimdusit, Chulalongkorn University</i> Due to high NIR absorption efficiency, multi-walled carbon nanotubes (MWCNTs) were incorporated in biobased benzoxazine/epoxy shape memory polymers as reinforcement, endowing the copolymers with NIR actuation capability under ambient atmosphere.	2412-5 NANO-ENGINEERED GRAPHENE POLYMER COMPOSITES WITH SELF-HEALTH MONITORING <i>Pengyu Zhou, The Hong Kong Polytechnic University</i>	2413-5 REACTION ASSISTED FLASH SINTERING OF AL2O3-YAG EUTECTIC COMPONENT CERAMIC <i>Jinling Liu, Southwest Jiaotong University</i> The mixed Al2O3-Y2O3 powders can be flash sintered at 800 °C under the applied electrical field of 900 V/ cm. It demonstrate the feasibility of employing the flash sintering technique to fabricate oxide eutectic ceramic.	2414-5 FLEXURAL IMPACT PROPETIES AND FRACTURE BEHAVIORS OF CONTINUOUS AND DISCONTINUOUS RANDOM REINFORCED THERMOPLASTIC CFRP <i>Fumiaki Yano, Shimadzu Corporation</i>	2415-5 CHARACTERIZATION OF SIC REINFORCED AZ91 MAGNESIUM ALLOY COMPOSITES PRODUCED USING IN-SITU MICROWAVE CASTING <i>Apurbba Kumar, Sharma, Indian Institute of Technology Roorkee</i>	
		1750-1810	2401-6 HYDROTHERMAL SYNTHESIS OF CO3O4@CF_RGO COMPOSITES AND THE EXCELLENT MICROWAVE ELECTROMAGNETIC PROPERTIES <i>Shuang Li, Beihang Universit</i>		2402-6 SUSTAINABLE BIOCOMPOSITES FROM A SUPER TOUGHENED NANO-BLEND MATRIX FOR INDUSTRIAL APPLICATIONS <i>Manjusri Misra, University of Guelph</i> Three different compostable fillers, i.e. natural fiber, agriculture residues, and mineral talc, were added into a novel biodegradable nano-blend matrix. Biocomposites with excellent mechanical-thermal properties in comparison to the existing counterparts were created.	2403-6 EXPERIMENTAL STUDY ON TORSIONAL STIFFNESS OF A WIND TURBINE BLADE THROUGH COMBINED LOADING <i>Mareen Tiedemann, Technical University of Denmark - DTU Wind Energy</i>	2405-6 TOUGHENING OF POLYLACTIC ACID/BAMBOO BIOCOMPOSITE FOR FUSED DEPOSITION MODELING <i>Xianglian Xiao, USQ</i> Two toughening agents have been investigated in PLA/ bamboo powder biocomposite for 3D printing application. The effect of toughness modification on the toughness properties, viscoelastic behavior, processability, filament quality were evaluated.	2407-6 A REPRESENTATIVE VOLUME ELEMENT MODEL FOR ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE COMPOSITE <i>Dimitrios Kempesis, Imperial College London</i>		2408-6 IMPACT TOLERANCE OF THERMOPLASTIC AND THERMOSET EPOXY CARBON TEXTILE COMPOSITES <i>Valter Carvelli, Politecnico Di Milano</i> The impact performance of carbon textile reinforced highly polymerized thermoplastic epoxy is studied and compared to the thermoset counterpart, considering the imparted damage and the after impact compression strength	2409-6 DELAMINATION FAILURE IN MMB TEST WITH PERIDYNAMICS <i>Yile Hu, Shanghai Jiao Tong University</i>	2410-6 ORGANIZED HYBRID NANOCOMPOSITES FOR ROBUST STRETCHABLE SENSORS AND FLEXIBLE MICROLASERS <i>Vladimir Tsukruk, Georgia Institute of Technology</i> We discuss how organized bionanocomposites with enhanced mechanical and sensing performance can be constructed from biopolymers such as silk fiibroin and synthetic carbon materials such flexible 2D graphenes.		2412-6 ELECTRICAL RESISTIVITY OF THIN-PLY COMPOSITES <i>Liyong Tong, The University of Sydney</i>	2413-6 SICf/SIC STIFFNESS PREDICTION, THERMAL RESIDUAL STRESS AND PROGRESSIVE DAMAGE SIMULATIONS BY MICRO-MECHANICS MODEL <i>Bin Liu, Northwestern Polytechnical University</i> Focusing on predicting the macro-stiffness and thermal residual stress for SiCf/ SiC composites, 3D micro-structure finite element analysis methods are applied to representative volume elements and the progressive damage simulation.	2414-6 CHARACTERIZATION AND MODELING OF WOVEN SILICON CARBIDE TUBULAR COMPOSITES <i>Ghatu Subhash, University of Florida</i>	
1810-1830						2407-7 CARBON FIBRE PROSTHETIC FOOT: DESIGN AND MANUFACTURING PROCESS <i>Chao Liu, Deakin University</i>			2409-7 FRACTURE TOUGHNESS OF GRAPHENE SHEET ESTIMATED BY COUPLING OF BOUNDARY ELEMENT AND FINITE ELEMENT <i>Chyanbin Hwu, National Cheng Kung University</i> A new approach of multi-scale simulation via coupling of boundary element and finite element is proposed to predict the fracture toughness of graphene sheet.			2412-7 STRUCTURAL HEALTH MONITORING DEMONSTRATION OF PRESET-DAMAGE MICROWIRE ARRAYS ENABLED COMPOSITES BASED ON MICROWAVE PROPERTIES <i>Xuefei Zheng, Institute for Composites Science Innovation (InCSI), Zhejiang University</i> Microwire array modified by 5 wt.% silane can detect 1mm diameter local damage, which is 1 mm away from the nearest microwire in the composite attributed to the marked alteration of domain structure due to the improved stress transfer by evaluating its absorption and reflection coefficients, which is promising in structural health monitoring applications.	2413-7 MICRO-SCALE ANALYSIS OF PROGRESSIVE DAMAGE IN CERAMIC MATRIX COMPOSITES <i>Riccardo Manno, University of Bristol</i> This work aims to investigate the damage behaviour of CMCs at the Micro-Scale through the employment of representative elementary volumes located within single fibrous tows.	2414-7 IN SITU OBSERVATION OF CRACK FORMATION IN A ALUMINA-ALUMINA COMPSOITE AT 1200°C <i>Dong Liu, University of Bristol</i>			
1900-2300	Student Party Wunderbar - Munich South Wharf																
1915-2230	ICCM VIP Dinner (invitation only)																


WEDNESDAY 14 AUGUST																	
Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211		Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219	
0800-0805	Day 3 Welcome & Announcements																
0805-0850	PLENARY LECTURE: FUTURE CHALLENGES FOR CARBON FIBRE COMPOSITES: A JOURNEY THROUGH THE VALUE CHAIN <i>Bronwyn Fox, Swinburne University, Australia</i> Plenary 2																
0850-0900	Move to concurrent sessions																
0900-1040	3101 Nano-composites		3103 Resin and polymers	3104 Liquid composites moulding	3105 Additive manufacturing	3106 Composite structures	3107 Multiscale modelling		3108 Textile-based composites	3109 Fracture and damage	3110 Defence	3111 Biomedical	3112 Testing methods	3113 Hybrid composites	3114 Fatigue	3115 Metal matrix Composites	
0900-0930	KEYNOTE 1: MECHANICAL PROPERTIES AND FRACTURE RESISTANCE OF THREE-DIMENSIONAL GRAPHENE/POLYMER COMPOSITES <i>Jang-Kyo Kim, University Science & Technology (Plenary 2)</i> KEYNOTE 2: MODELING OF IMPACT DAMAGE AND COMPRESSION AFTER IMPACT OF LAMINATED COMPOSITE AEROSPACE STRUCTURES <i>Paul Davidson, Michigan University (Meeting room 211)</i> KEYNOTE 3: INTERFACIAL DAMAGE IN FIBRE REINFORCED COMPOSITES MODELLED IN THE FRAMEWORK OF FINITE ELEMENTS WITH EMBEDDED REGIONS <i>Stepan Lomov, KU Leuven (Meeting room 212)</i> KEYNOTE 4: CHARACTERISATION AND MODELLING OF STRUCTURAL BATTERY COMPOSITES <i>Lief Asp, Chalmers University (Meeting room 213)</i> KEYNOTE 5: AN INTEGRATED APPROACH TO DESIGN AND MONITOR COMPOSITE STRUCTURES UNDER IN-SERVICE FATIGUE LOADINGS <i>Marino Quaresimin, Universita degli Studi di Padova (Meeting room 219)</i>																
0930-0940	Move to concurrent sessions																
0940-1000	3101-1 THERMAL PROPERTIES OF UNSATURATED POLYESTER COMPOSITES FILLED WITH MODIFIED SILICA AEROGEL <i>Muhamad Azizi, Mat Yajid, Universiti Teknologi Malaysia</i> Unsaturated polyester resins (UPR) are widely used in building and construction industries such as wall panels, and flooring. For the design of these structures, thermal properties such as thermal conductivity and stability are among the important criteria.		3103-1 ORGANIC RADICAL EPOXY THERMOSET <i>Jaworski Capricho, Swinburne University of Technology</i> We report the development of stable organic radicals as a polymeric framework for functional conductive materials.	3104-1 UNDESIRED FIBER DEFORMATION OF A MULTI-LAYERED FIBER PREFORM IN LIQUID COMPOSITE MOLDING PROCESS <i>Dong Gi Seong, Pusan National University</i> A simple and efficient analytic scheme was proposed to predict deformations of a multi-layered fiber preform by comparing the forces applied to the preform in a mold of liquid composite molding.	3105-1 ADDITIVE MANUFACTURING OF COMPOSITE SANDWICH PANELS FOR BROADBAND SOUND ABSORPTION <i>Filippo Iervolino, Polytechnique Montréal</i> This work presents single and multi-material Fused Deposition Modeling (FDM) of sandwich panels featuring multiple Helmholtz resonators that allow sound absorption over a wide range of frequencies.	3106-1 TORSIONL PROPERTIES OF A STIFFENED COMPOSITE TUBE <i>Sung Joon Kim, Korea Aerospace Research Institute</i>	3107-1 MODIFIED MORI-TANAKA METHODS FOR DAMAGE MODELLING OF SHORT FIBRE REINFORCED COMPOSITES <i>Atul Jain, Indian Institute of Technology Kharagpur</i>		3108-1 A NUMERICAL STUDY OF THE EFFECT OF DRAPING ON THE MECHANICAL PROPERTIES OF 3D WOVEN COMPOSITES <i>Ioannis Topalidis, University of Bristol (ACCIS)</i> A modelling framework is developed and compared to experimental data towards capturing the effect of draping on the mechanical properties of 3D woven layer-to-layer composites.	3109-1 EXCEPTIONS TO THE ASSUMPTION UNDERLYING THE SO-CALLED PHYSICALLY BASED FAILURE THEORIES <i>Shuguang Li, The University of Nottingham</i>	3110-1 EXPERIMENTAL INVESTIGATION AND MESOSCALE MODELING OF TEXTILE COMPOSITES UNDER HIGH-VELOCITY IMPACT <i>Hongxu Wang, The University of New South Wales (Canberra)</i> This work focuses on the effects of matrix rigidity on penetration resistance, energy absorption, and damage extent of UHMWPE textile composites subjected to high-velocity impact by a spherical steel projectile.	3111-1 IN VITRO EVALUATION OF SURFACE ROUGHNESS ON INITIAL RESPONSES OF OSTEOBLASTS CELLS ON A NEW AL2O3/CE-TZP NANOCOMPOSITE <i>Luis Antonio Díaz Rodríguez, Centro de Investigación en Nanomateriales Y Nanotecnología (CINN-CSIC-UNIOVI-PA)</i>	3112-1 EXPERIMENTAL INVESTIGATION ABOUT FLEXURAL PLASTIC AND FRACTURE BEHAVIOR OF CF MAT-TYPE THERMOPLASTIC COMPOSITES <i>Yuki Kamei, Shimadzu Corporation</i>	3113-1 IONIC CONDUCTIVITY AND YOUNG'S MODULUS OF SOLID POLYMER ELECTROLYTES FOR SUPERCAPACITOR <i>Suk Jin Kwon, Korea Institute of Materials Science</i>	3114-1 FATIGUE LIFE ESTIMATION OF A SHORT GLASS FIBERS REINFORCED THERMOPLASTIC: OPTIMIZATION OF AN ENERGETIC CRITERION AND CORRESPONDING VOLUME INTEGRATION FOR MULTIAXIAL APPLICATIONS <i>Caroline Goutal, Pprime Institute / Solvay</i>	3115-1 DEFORMATION BEHAVIOR OF ALUMINUM ALLOY MATRIX COMPOSITES REINFORCED WITH FEW-LAYER GRAPHENE <i>Seeun Shin, Sunchon National University</i>	
1000-1020	3101-2 ALIGNMENT AND REINFORCING POTENTIAL OF MULTIFILAMENT CNT FABRICS <i>Anastasiia Mikhalechan, IMDEA Materials Institute</i> The presentation is focused on CNT fibres and multifilament fabrics and the relationship between CNT alignment and reinforcing potential for structural composites.		3103-2 TOUGHNESS OF EPOXY POLYMERS CURED AT HIGH RATES <i>Declan Carolan, Fac Technology</i>	3104-2 SELF-SEALING TOOL CONCEPT FOR RTM-PROCESSES <i>Tim Stallmeister, Universität Paderborn</i>	3105-2 3D PRINTED CONTINUOUS FIBRE COMPOSITES: VALIDATION OF DESIGN & ANALYSIS METHODS <i>Mathew Joosten, Deakin University</i> The success of the present study demonstrates the first step in establishing validated design tools to facilitate forward facing simulations to optimise the topology of 3D printed composites to fully exploit the design flexibility of this emerging technology.	3106-2 DYNAMIC RESPONSE OF HYBRID CARBON FIBRE LAMINATE BEAMS UNDER BALLISTIC IMPACT <i>Tao Liu, Univeristy of Nottingham</i>	3107-2 COMPUTATIONAL CONTINUA MODELS OF COMPOSITE CURVED BEAMS <i>Dinghe Li, Civil Aviation University of China</i>		3108-2 CHARACTERISATION OF THE WRINKLING BEHAVIOUR OF A BIAXIAL NON-CRIMP FABRIC DURING FORMING <i>Verner Viisainen, University of Cambridge</i> The wrinkling behaviour of a biaxial NCF over four benchmark geometries is characterised through forming experiments with 3D-DIC and it is shown that shear angle alone cannot predict NCF wrinkling.	3109-2 STRENGTH AND FAILURE MODES IN RESISTANCE WELDED THERMOPLASTIC COMPOSITE JOINTS: EFFECT OF FIBER-MATRIX ADHESION <i>Xuekuan Li, Beihang University</i> This work focus on the influence of stainless steel mesh size on the failure modes of resistance welded thermoplastic composite joints.	3110-2 EXPERIMENTAL OPTIMISATION FOR MILITARY AEROSCARF OUT-OF-AUTOClave SCARF REPAIRS <i>Riley Mitchell, University of Southern Queensland</i>	3111-2 MECHANICAL, SHAPE MEMORY AND ANTIBACTERIAL PROPERTIES OF GRAPHENE OXIDE/PLCL NANOCOMPOSITES <i>Xili Lu, Harbin Engineering University</i> The g-GO/PLLA nanocomposites show good shape memory effect and antibacterial properties, which suggest that these nanocomposites may potentially be useful for a variety of biomedical applications.	3112-2 COMPARISON OF PICTURE FRAME DEVICES AND ANALYSIS OF LOCKING ANGLE FOR FABRICS WITH DIFFERENT CROSS-PLY ANGLES <i>Benedikt Lux, Swinburne University of Technology</i> This study includes a omparison of established and novel shear testing devices and an investigation of non-crimp fabrics with different fiber orientations for automating the preforming of stiffening elements.	3113-2 INVESTIGATION FOR CONTINUOUS HYBRID MOLDING PROCESS FOR LONG MEMBER <i>Akio Ohtani, Kyoto Institute of Technology</i>	3114-2 EXPERIMENTAL AND NUMERICAL DETERMINATION OF THE MODE II FRACTURE TOUGHNESS OF WOVEN COMPOSITES <i>Rowan Healey, Monash University</i> A three-dimensional finite element model was developed to determine the mode II fracture toughness of a woven composite, validated by an experimental and numerical comparison using a unidirectional specimen.	3115-2 COMPOSITE CASTINGS REINFORCED BY TIC PARTICLES <i>Łukasz Szymariski, University of Science and Technology in Cracow; Innerco sp. z o.o.</i> The authors presented three different methods of the in situ fabrication of metal matrix composite via casting process: composite layer, local composite reinforcement and cast composite reinforced by TiC.	
1020-1040	3101-3 SYNERGETIC ENHANCEMENT OF THERMAL CONDUCTIVITY BY ALUMINA NANOWIRES IN EPOXY COMPOSITES CONTAINING MICRO FILLERS <i>Kazuaki Sanada, Toyama Prefectural University</i>			3104-3 INFLUENCE OF DISSOLVED GASSES IN EPOXY RESIN ON RESIN INFUSION PART QUALITY <i>Sam van Oosterom, Center for Advanced Composite Materials - University of Auckland</i>	3105-3 ADDITIVE MANUFACTURED METALLIC FORCE TRANSMISSIONS IN FIBRE REINFORCED THERMOPLASTICS <i>Arne Kunze, Leibniz Institute for Materials Engineering</i>	3106-3 HIERARCHICAL THERMOPLASTIC COMPOSITE LATTICE STRUCTURE: AXIAL COMPRESSIVE PROPERTY <i>Houchang Liu, Chongqing University</i>	3107-3 PROCESS-INDUCED MICROSTRUCTURE DURING COMPRESSION MOLDING OF HIGH FIBER VOLUME FRACTION SHEET MOLDING COMPOUND <i>Francois Mahe, University of Delaware</i> A new formulation is proposed to describe the evolving multi-scale microstructure and the viscous flow behavior during SMC compression molding.		3108-3 MULTI-SCALE MODELING FOR PREDICTING THE VISCOELASTIC BEHAVIORS OF 3D BRAIDED COMPOSITES <i>Tao Zeng, Harbin University of Science and Technology</i> A new alternative calculation procedure was presented to characterize the time-dependent viscoelastic behaviors of resin-based 3D braided composites from the perspective of macroscopic, mesoscopic and microscopic scale.	3109-3 FAST EVALUATION OF THE LONGITUDINAL TENSILE FAILURE STATISTICS IN UNIDIRECTIONAL COMPOSITES ACCOUNTING FOR MATERIAL VARIABILITY <i>Fabio Malgioglio, Siemens Industry Software NV</i> The longitudinal tensile properties of unidirectional composites and their scatter are predicted with a multi-scale model, including the material variability. A simple Machine Learning inspired strategy enables very fast computations.		3111-3 EFFECT OF CROSS-LINKING CONDITION ON MECHANICAL PROPERTIES OF OSTEOECTIN-COATED HAP/ COLLAGEN <i>Mototsugu Tanaka, Kanazawa Institute of Technology</i>	3112-3 RELATIONSHIP BETWEEN FLEXURAL AND COMPRESSIVE STRENGTHS OF UNIDIRECTIONAL THERMOPLASTIC CFRP <i>Tsuyoshi Matsuo, The University of Tokyo</i> The authors proposed a new flexural test method for unidirectional thermoplastic CFRP. The flexural strength has a strong correlation with the compressive strength.	3113-3 MECHANICAL PROPERTIES AND MICRO FRACTURE PROCESS OF HYBRID COMPOSITE MATERIAL WITH CF SHEETS WITH MICRO GLASS BALLOON <i>Takuto Omura, Graduate School of Fukushima university</i>	3114-3 CONTROLLED STRAIN RESONANCE FREQUENCY FATIGUE TEST BENCH FOR CFRP <i>Eduard Relea, Inspire AG - ETH Zurich</i> The cast iron ram of a BRUDERER BSTA-200 was redesigned in CFRP and the fatigue behavior of CFRP had to be tested in a very high cycle fatigue test bench.	3115-3 INVESTIGATION ON NI-MN-GA PARTICLES/CU COMPOSITES PREPARED BY POWDER METALLURGY METHOD <i>Bing Tian, Harbin Engineering University</i> Microstructure, phase transformation and mechanical property of Ni-Mn-Ga particles/Cu composites prepared by pressureless sintering method are investigated in the present work.	
1040-1110	Coffee break Exhibition hall																



WEDNESDAY 14 AUGUST																		
Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211			Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219	
1110-1240	P3201 Polymer matrix materials	P3202 Composite structures and SHM	MSC Software industry workshop	P3204 Additive manufacturing and advanced manufacturing and automation	P3205 Liquid composites moulding and automated fibre placement	P3206 Nano-composites	P3207 Repair and tribology and fatigue			P3208 Structural analysis and optimisation	P3209 Hybrid composites	P3210 Aerospace and Automotive	P3211 Defence and biocomposites	P3212 Bio-inspired composites and green and natural fibre composites	Altair industry workshop	P3214 Metal matrix composites and meta-composites	Industry-Academia Discussion Platform	
1110-1115	P3201-1 PREPARATION AND CHARACTERIZATION OF HIGH STRENGTH AND HIGH OIL RESISTANT FLAME RETARDANT EVA COMPOSITES FOR CABLE <i>Yiyang Zhou, School of Chemistry and Chemical Engineering, Hefei University of Technology</i> Macromolecular compatibilizer POE-g-GMA is used to modify EVA composites. The related results showed obvious improvements in the interfacial interactions, which was attributed to the improved filler dispersion and strengthened interfacial bonding induced by POE-g-GMA. A modified interphase structure was accordingly proposed and related to the mechanical performance.	P3202-1 MANUFACTURING PARAMETERS OPTIMIZATION FOR MAXIMIZING STRUCTURAL PERFORMANCE AND QUALITY OF COMPOSITE PRESSURE VESSEL <i>Seungmin Jeong, Agency for Defense Development</i>	MSC Software industry workshop *invitation only event* MULTI-SCALE MATERIAL MODELING WITH DIGIMAT TO SPEED-UP INNOVATION IN COMPOSITE MATERIAL AND PART DESIGN <i>Soumik Chakrabarty, Emilie Storms</i> This workshop will run for 90 minutes Sponsored by 	P3204-1 INSTRUMENTED IMPACT BEHAVIOR OF PANELS PRODUCED BY ADDITIVE MANUFACTURING <i>Thomas Whitney, University of Dayton</i>	P3205-1 NUMERICAL SIMULATION OF RESIN FLOW THROUGH 3D FIBROUS REINFORCEMENT AT MULTISCALE <i>Chaozhong Chen, CRRC Academy</i>	P3206-1 GRAPHENE OXIDE/ POLYMER-BASED NANOCOMPOSITE HYDROGEL FOR BIOMEDICAL APPLICATIONS WITH ANTIMICROBIAL PROPERTY <i>Lee Won Chang, Hannam University</i> We presented the fabrication of GO/ polymer composite hydrogel with flexibility, soft, antimicrobial, enhanced mechanical property. Its hydrogel expected that have enhanced mechanical properties by GO playing role the physical cross-linker.	P3207-1 NEW MATERIAL REMOVAL TOOLS AND PROCESSES TO SAFELY EXPEDITE MAINTENANCE ON COMPOSITE STRUCTURES <i>James Mazza, US Air Force Research Laboratory</i> More efficient and durable nonmetallic tools for removal of a variety of materials, including sealants, elastomeric coatings, adhesives, caulks and tapes, were developed, evaluated for use on composites and commercialized.			P3208-1 AN ASYMPOTIC SOLUTION TO DENSITY DISTRIBUTION OF GRADED CELLULAR MATERIALS WITH A CONSTANT IMPACT LOAD <i>Baixue Chang, University of Science and Technology of China</i>	P3209-1 INVESTIGATION OF LOW-VELOCITY IMPACT AND CAI BEHAVIOR OF HYBRID SANDWICH COMPOSITES <i>Alex Osei Bonsu, Harbin Engineering University</i>	P3210-1 WARPAGE BEHAVIOUR OF DISCONTINUOUS CF/PEEK THIN PLATES <i>Natassia Batista, McGill University</i> Two different strand sizes were compared through warpage measurements. For the small strands, an alignment grid was also proposed to better control their orientation.	P3211-1 DIC ANALYSIS OF SHRINKAGE BEHAVIORS OF DENTAL COMPOSITES DURING DENTAL RESTORATION <i>Nak-Sam Choi, Hanyang University</i> The changes of polymerization shrinkage distribution in the composite resin part were examined by the DIC method during dental restoration for two types of composite resins. The maximum shrinkage strain happened at the center to be -0.56% for Clearfil AP-X and -0.44% for Filtek P90.	P3212-1 DESIGN AND CONSTRUCTION OF BIO-INSPIRED SMART MATERIALS WITH REVERSIBLE ADHESION <i>Ying Chu, Harbin Institute of Technology</i>	Altair industry workshop RESEARCH MEETS PRACTICE - APPLYING MULTISCALE MODELING AND OPTIMIZATION IN COMPOSITES ENGINEERING <i>Markku Palanterä, Director of Global Composites Business Development</i> This workshop will run for 90 minutes Sponsored by 	P3214-1 ENHANCING THE MECHANICAL PROPERTIES OF TIB2 REINFORCED MAGNESIUM COMPOSITES USING STIR CASTING METHOD <i>Anbuchezhian, Gnanasambandam, Srm Valliammai Engineering College</i>	Mobility between Academia and Industry <i>Isabelle Paris, Bombardier</i> Bridging the gap between education and employment <i>Tony Belcher, Boeing</i> Modernising Composites Regulations <i>Ole Thomsen, Bristol University</i> Increasing access for SMEs to international research <i>Matt Jevons, MT Aerospace</i> This session aims to debate topics that cross between academia and industry in a close and less formal environment. Come an join our animators as we discuss key topics and identify ways forward. Each animator will represent a topic and visitors can move between individual topics or stay with one that particularly interests them.	
1115-1120	P3201-2 EFFECT OF GRAPHENE AND MWCNTS AND ITS DOSAGE ON MODE I INTERLAMINER FRACTURE TOUGHNESS OF CFRP <i>Shuanghui Cao, School of Aeronautics Northwestern Polytechnical University</i> The paper is to enhance the interlaminar toughness of unidirectional composite laminate by supplying graphene or MWCNTs into the middle interlaminar at a inexpensive way!	P3202-2 A TRISTABLE CROSS-SHAPED UNSYMMETRIC FIBER-REINFORCED CROSS-PLY LAMINATES: EXPERIMENTAL AND SIMULATION METHODS <i>Yang Li, Key Laboratory of E&M (Zhejiang University of Technology)</i> This paper presents a novel cross-shaped unsymmetric fiber-reinforced cross-ply laminates, which is different from square-shaped unsymmetric fiber-reinforced cross-ply laminates and has three stable configurations.		P3204-2 OPTIMIZATION OF PROCESS PARAMETERS FOR FUSED FILAMENT FABRICATION USING TOOL PATH REVERSING <i>Vishal Hayaqirvan, Rise Sicomp</i> A novel method to optimize the process parameters for fused filament fabrication (FFF) (an additive manufacturing technique) is developed in this paper. GCode instructions used by the FFF machine is analysed and a FE model of the manufactured part is built. The FE model is used to optimize the process parameters governing the FFF manufacturing process.	P3205-2 A TWO PHASES COUPLING FREE AND POROUS FLOW METHOD AT MULTI-SCALES OF LCM PROCESS <i>Arthur Cantarel, Clément Ader Institute (ICA)</i>	P3206-2 HIGH-EMISSION NANO-COMPOSITE FILM FOR EUV PELLICLE APPLICATIONS IN SEMICONDUCTOR FABRICATION PROCESS <i>Jinho Ahn, Hanyang University</i>	P3207-2 FAILURE AND RELIABILITY ANALYSIS OF IN-SERVICE REPAIRED COMPOSITES <i>Wei Feng, School of Aeronautics, Northwestern Polytechnical University</i> This paper performed experimental and numerical works on the behavior of in-service repaired composites via scarf method, and reliability analysis was conducted to predicted safe failure strengths at different reliability and confidence levels.		P3208-2 VIRTUAL CALCULATION OF THE B-BASIS ALLOWABLES OF NOTCHED COMPOSITE LAMINATES <i>Carolina Furtado, University of Porto</i>	P3209-2 ROBUST AND CONDUCTIVE HYDROGEL BASED ON CARBON NANOTUBE/ARAMID NANOFIBER FOR STRUCTURAL ENERGY STORAGE <i>Wenxin Cao, Harbin Institute of Technology</i>	P3210-2 EXPERIMENTAL STUDY ON INTER-YARN FRICTION CHARACTERISTICS OF STF-KEVLAR FABRICS WITH DIFFERENT MASS CONCENTRATIONS <i>Wei Chen, Nanjing University of Aeronautics and Astronautics</i> In the current paper, Three types of STF suspension was prepared using spherical SiO2 particles of 650 nm diameter in different weight concentration to impregnate the Kevlar49 fabrics. The rheological properties of different STF were investigated.	P3211-2 EXPERIMENTAL STUDY ON ANTI-PENETRATION PERFORMANCE OF SANDWICH TARGET MADE OF THIN STEEL PLATES AND WOOD AGAINST 7.62MM BULLET <i>Liling He, Institute of Systems Engineering, China Academy of Engineering Physics</i> 1. Ballistic limit velocities of the thin steel plates are fitted according to Recht-Ipson Model. 2. Dynamic compressive strengthes of transverse and longitudinal wood are fitted according to the dynamic cavity expansion model. 3. The tranverse wood has better anti-penetration performance than that of the longitudinal wood.	P3212-2 PREPARATION AND ELECTRICAL CHARACTERIZATIONS OF MAN-MADE NACRE-LIKE COMPOSITES <i>Yingbang Yao, Guangdong University of Technology</i>		P3214-2 WEAR AND MECHANICAL CHARACTERISTICS OF AL-SI/TIB2 COMPOSITES <i>Jimmy Karloopia, Indian Institute of Technology Roorkee</i>			
1120-1125	P3201-3 TAILORED POLYMER NETWORKS BY SEQUENTIAL THIOL-ENE PHOTOPOLYMERIZATION <i>Sergio Cespedes, WMG</i> PEG-co-TEG polymer networks were photosynthesized in a two-step process to obtain alternating network structure. Their mechanical properties were compared against their uncontrolled counterparts.	P3202-3 A NUMERICAL MODEL FOR COUPLING HYGRO-MECHANICAL PHENOMENA IN COMPOSITE MATERIALS <i>Mamadou Abdoul, Mbacke, IRT Jules Verne</i>		P3204-3 FLEXURAL FATIGUE STRENGTH OF 3D-PRINTED CONTINUOUS CARBON FIBER REINFORCED THERMOPLASTIC LAMINATES <i>Moriyumi Inaba, Chiba Institute Technology</i>	P3205-3 PERMEABILITY EVALUATION IN VACUUM-ASSISTED RESIN TRANSFER MOLDING OF CARBON FIBER REINFORCED PLASTICS <i>Fumiya Isono, Tokyo Metropolitan University</i> Permeability measurements were conducted for one-dimensional unsaturated flow on carbon woven fabric using epoxy resin. To reduce experimental scatter, fabric preparation and materials arrangement methods were examined.	P3206-3 CONDUCTIVE NANOPARTICLE ENHANCEMENTS FOR STRUCTURAL DIELECTRIC CAPACITORS <i>KY Chan, Swinburne University of Technology</i>	P3207-3 BONDED COMPOSITE REPAIRS UNDER DRY/COLD AND HOT/WET ENVIRONMENTAL CONDITIONS <i>Florian Röper, Polymer Competence Center Leoben GmbH</i> This work focuses on the influence of testing at -30 °C and testing after 100 cycles between -30 °C and 70 °C / 85 % r. h. on repair specimens.		P3208-3 DESIGN OF SEMI-COMPLEX PARTS USING ANISOTROPIC CARBON FIBER CARD WEB REINFORCED THERMOPLASTICS <i>Yasuyuki Furuta, The University of Tokyo</i> In this study, it was first verified that the mechanical properties of CWT can be calculated from the fiber orientation distribution (FOD) by Netting Theory.	P3209-3 EFFECT OF FIBER DISTRIBUTION ON COMBINED COMPRESSION-TORSIONAL RESPONSE OF HYBRID COMPOSITES <i>Sneha Bhushan Chervala, Indian Institute of Technology Bombay</i> The objective of the current work is to study the role of fiber distribution in the combined loading response of hybrid glass/ carbon composites using finite element analysis. The change in response with varying fiber distribution is presented taking into account of the different fiber location in the representative volume element (RVE).	P3210-3 CF/MODIFIED-PEEK COMPOSITES FOR AIRCRAFT <i>Takahiro Hayashi, Mitsubishi Chemical Corporation</i> We developed modified-PEEK resins, which resulted 20°C higher Tg than conventional PEEKs. In this study, we showed some properties of modified-PEEK matrix carbon fiber composites, such as mechanical property at high temperature, fluid resistance and flammability.	P3211-3 COMPUTATIONAL MULTISCALE MODELLING OF CERAMIC MATERIALS FOR DEFENCE NEEDS <i>Meredith Mahoney, Department of Defence</i> Historically, new protective materials and composite systems were developed mainly through laborious trial and error. However, in this work a multiscale computational approach, using the application of ab initio methods through to validated continuum models, will provide a framework through which to understand and predict the performance of protective materials. It will also allow materials to be tailored to counter new and evolving threats.	P3212-3 BONE TISSUE SCAFFOLD BASED ON SHAPE MEMORY POLYMER <i>Wei Zhao, Harbin Institute of Technology</i> This paper details an application of SMP on porous bone tissue scaffold. Compared with traditional bone tissue scaffold, the scaffold based on SMP possesses advantages of low cost, easy assembly and easy adjustment. and most importantly, the adaptable bone tissue scaffold will adapt to keep the best fixed state.	P3214-3 THE MAGNETIC AND ELECTROMAGNETIC PROPERTIES OF FECONISXAL0.4 HIGH ENTROPY ALLOY POWDERS <i>Yuping Duan, Dalian University of Technology</i>				

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Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211			Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
1125-1130	P3201-4 PREPARATION AND CHARACTERIZATION OF MODIFIED POLYVINYL ALCOHOL/SODIUM ALGINATE HYDROGEL <i>Jianle Gong, Institute of Materials Processing and Intelligent Manufacturing, Harbin Engineering University</i>	P3202-4 NONLINEAR FINITE ELEMENT ANALYSIS OF COMPOSITE BOLTED LAP-JOINTS : EXPERIMENTAL VS . NUMERICAL TESTS <i>Benoit Montagne, Institut Clément Ader</i>	P3202-4 MSC Software industry workshop *invitation only event* MULTI-SCALE MATERIAL MODELING WITH DIGIMAT TO SPEED-UP INNOVATION IN COMPOSITE MATERIAL AND PART DESIGN <i>Soumik Chakrabarty, Emilie Storms</i> This workshop will run for 90 minutes Sponsored by MSC Software <i>CONTINUED</i>	P3204-4 3D PRINTING OF CONTINUOUS SIZED CARBON FIBER REINFORCED PA6 COMPOSITES <i>Tengfei Liu, Xi'an Jiaotong University</i> A sizing treatment process is successfully applied to improve the interfacial performance and mechanical properties of 3D printed continuous carbon fiber reinforced nylon composites.	P3205-4 LINKAGE ANALYSIS OF PERMEABILITY AND MECHANICAL EXPERIMENTS FOR CFRP <i>Seonghun Kwak, Gyeongbuk Hybrid Technology Institute</i> This study saved time and money because it was able to carry out the permeability coefficient experiment and the mechanical property experiment in a lump sum. We hope that if future experimental data accumulates, we will be able to minimize the cost of failure by sharing data with many people.	P3206-4 NANO-ENABLED MANUFACTURING OF AEROSPACE-GRADE THERMOPLASTIC COMPOSITES <i>Frederick Daso, Massachusetts Institute of Technology</i> This work presents the first application of Out-of-oven (OoO) heating to producing carbon fiber reinforced thermoplastic specimens, which are comparable or better than their conventionally hot-press produced laminates.	P3207-4 NON-ASBESTOS POLYBENZOXAZINE COMPOSITES: FRICTION AND MECHANICAL PROPERTY <i>Chanchira Jubsilp, Srinakharinwirot University</i> The addition of short carbon fiber at 25 wt% in the polybenzoxazine composite showed the optimal friction coefficient which is suitable for personal car and significant improvement of flexural properties.			P3208-4 REDESIGN AND OPTIMIZATION OF THERMAL PROTECTION SYSTEM FOR ATMOSPHERIC REENTRY <i>Guokai Han, Harbin Institute of Technology</i> In this work, thermal behavior of a lightweight carbon phenolic ablator and a hybrid thermal protection structure has been analyzed based on the established mathematical model.	P3209-4 PROPERTIES AND FAILURE PREDICTION OF INTERPLY HYBRID COMPOSITES OF GLASS AND SELFREINFORCED POLYPROPYLENE <i>Farzaneh Hassani, Queen's University Belfast</i>	P3210-4 EFFECTS OF PROCESS CONDITIONS ON AEROSPACE GRADE EPOXY/ CARBON FIBRE COMPOSITE PROPERTIES <i>Matt Jennings, School of Engineering, Deakin University</i> It was found that when using isostatic pressure when curing aerospace composites, the interlaminar shear strength and the internal and surface porosity was comparable to Autoclave cured samples.	P3211-4 THE DEFORMATION AND FAILURE RESPONSE OF ULTRA-HIGH MOLECULAR WEIGHT POLYETHYLENE COMPOSITE TO LOCALIZED BLAST LOADING <i>Long Nguyen, Defence Science and Technology Group</i> Experiments were conducted to study the response of UHMW-PE composite to localised blast loading. The rupture threshold, deformation and failure mechanisms of the material was investigated in this work.	P3212-4 NATURAL FIBRE BASED HYBRID POLYPROPYLENE COMPOSITES: AN INSIGHT INTO THERMAL PROPERTIES <i>Rupam Gogoi, Indian Institute of Technology Roorkee, India (IIT Roorkee)</i> Polypropylene (PP) composites were prepared by incorporating short bamboo fiber (SBF) and treated hollow glass microspheres (HGM) and their thermal, thermo-mechanical and water absorption behaviour were analysed.	P3212-4 Altair industry workshop RESEARCH MEETS PRACTICE - APPLYING MULTISCALE MODELING AND OPTIMIZATION IN COMPOSITES ENGINEERING <i>Markku Palanterä, Director of Global Composites Business Development</i> This workshop will run for 90 minutes Sponsored by  <i>CONTINUED</i>	P3214-4 OPTIMIZING THE MICROSTRUCTURE AND MECHANICAL BEHAVIORS OF IN-SITU TIC-IT/ NI COMPOSITES BY SUBSEQUENT THERMAL TREATMENT <i>Wenqiang Hu, Beijing Jiaotong University</i>	Mobility between Academia and Industry <i>Isabelle Paris, Bombardier</i> Bridging the gap between education and employment <i>Tony Belcher, Boeing</i> Modernising Composites Regulations <i>Ole Thomsen, Bristol University</i> Increasing access for SMEs to international research <i>Matt Jevons, MT Aerospace</i>
			1130-1135	P3201-5 THE EFFECTS OF MOISTURE AND TEMPERATURE ON THE FLEXURAL PROPERTIES OF CARBON FIBER PAPER REINFORCED THERMOPLASTICS/ POLYAMIDE 6 <i>Xiangdong He, The University of Tokyo</i> The effects of moisture and temperature on the flexural properties of carbon fiber reinforced polyamide 6 materials were researched in this study.	P3202-5 MICRO-MECHANICAL FAILURE ANALYSIS OF A UNI-DIRECTIONAL COMPOSITE PLY - COHESIVE ELEMENTS & A DUCTILE FRACTURE APPROACH <i>Akash Sharma, IIT Indore</i> The failure behavior of a uni-directional (UD) carbon fiber reinforced epoxy composite ply subjected to transverse tension, compression and shear loads was studied using computational micro-mechanics.In order to capture the epoxy matrix plastic deformations and the subsequent damage, a ductile fracture criterion was used in combination with the linear extended Drucker-Prager plasticity model.	P3204-5 INTERLAYER BONDING BEHAVIORS OF 3D PRINTED CONTINUOUS CARBON FIBER REINFORCED PEEK COMPOSITES <i>Meng Luo, Xi'an Jiaotong University</i> The interlayer bonding behavior by implementing the process of pre-impregnation and laser preheating was studied for CCF/PEEK composites extrusion AM fabrication to avoid obvious delamination.	P3205-5 EFFECT OF WETTABILITY ON IMPREGNATION PROCESS OF VISCOUS FLUID TO WOVEN FIBER BUNDLES <i>Atsuki Mizuno, Tokyo University of Science</i> We investigated the effect of wettability on impregnation process of viscous fluid to woven fiber bundles on resin transfer molding method.	P3206-5 MULTIFUNCTIONAL COMPOSITES WITH MODIFIED CARBON FIBERS FOR LIGHTNING STRIKE PROTECTION <i>Anchalee Duongthipthewa, The Hong Kong Polytechnic University</i> New lightning strike protection (LSP) system was fabricated by integrating GNPs-coated on fuzzy fiber composites. The lightning damages in composites with/ without LSP system were also predicted using the numerical model offering an alternative material for LSP applications.	P3207-5 WEAR PROPERTIES OF PAN- AND PITCH-BASED CARBON FIBER REINFORCED PLASTICS WITH SIC-NANOPARTICLES <i>Shigenori Inoue, Doshisha university</i> Friction tests and SEM observations were conducted to investigate the wear characteristics of PAN- and pitch-based carbon fiber reinforced plastics with SiC-nanoparticles.		P3208-5 EXPERIMENTAL AND SIMULATION STUDY OF GFRP WITH LOCAL FIBRE DEFLECTION UNDER BEARING LOADS <i>Lars Thorsten Hefft, Clausthal University of Technology</i>	P3209-5 IMPACT OF CELLULOSE FILAMENTS ON INTERLAMINAR PROPERTIES, FLAMMABILITY AND THERMAL DEGRADATION BEHAVIOUR OF POLYMER MATRIX COMPOSITES <i>Félix Lessard, Polytechnique Montréal</i> A fibre reinforced thermoplastic composite material composed of polyamide 6 with fire-retardant additive (PA6-FR), glass fibre, and cellulose fibre was tested for application in aircraft cabin interior.	P3210-5 OBTENTION OF A CARBON-CARBON COMPOSITE MATERIAL FOR ITS USE IN EXPANDING NOZZLES FOR AEROSPACE VEHICLES <i>Liliana Maricarmen Lopez, Universidad Aeronautica en Queretaro</i>	P3211-5 ANALYTICAL AND EXPERIMENTAL STUDY ON HIGH-TEMPERATURE HIGH-VELOCITY IMPACT LIMIT FOR C/C COMPOSITE <i>Fan Yang, Harbin Institute of Technology</i> The debris cloud distributions of c/c composites subjected to high-temperature high-velocity oblique impacts has been investigated analytically and experimentally and the test data might provide general design guidelines for thermal protection shields.	P3212-5 THE EFFECT OF CORE-SHELL NANOPARTICLES ON STRENGTHENING AND TOUGHENING OF POLYLACTIDE AND JUTE FIBER REINFORCED POLYLACTIDE COMPOSITE <i>Hailing He, Harbin Engineering University</i>	P3214-5 EFFECT OF TA ADDITION ON MICROSTRUCTURES AND ROOM TEMPERATURE FRACTURE TOUGHNESS OF THE NB-16SI-20TI-5AL ULTRAHIGH TEMPERATURE ALLOY <i>Wenyuan Long, Nanchang Hangkong University</i> This session aims to debate topics that cross between academia and industry in a close and less formal environment. Come and join our animators as we discuss key topics and identify ways forward. Each animator will represent a topic and visitors can move between individual topics or stay with one that particularly interests them. <i>CONTINUED</i>	
1135-1140	P3201-6 THE INFLUENCE OF DIFFERENT POWDER IMPREGNATION PROCESSES ON THE PROPERTIES OF L-SHAPED WOVEN FABRIC REINFORCED PEEK COMPOSITES BY HOT STAMP FORMING <i>Hansong Liu, Beihang University</i>	P3202-6 EFFECT OF LAYING METHOD ON MECHANICAL PROPERTIES OF CONTINUOUS GLASS FIBER REINFORCED POLYPROPYLENE SANDWICH PANELS <i>Yiliang Sun, Beihang University</i> Continuous glass fiber reinforced polypropylene corrugated composite sandwich panels with different laminates were prepared in this paper. The effects of different panels and core materials on the mechanical properties of corrugated sandwich panels were studied.	P3204-6 DEVELOPMENT OF A TEST BENCH FOR FUSED FILAMENT FABRICATION <i>Alexander Matschinski, Technische Universität München</i>	P3205-6 A PARAMETRIC FLOW VISUALISATION STUDY OF THE WET COMPRESSION MOULDING PROCESS <i>Balaji Muthuvel, University of Auckland</i>	P3206-6 PHOSPHATE FUNCTIONALIZED GRAPHENE OXIDE AS ADSORBENT FOR THE REMOVAL OF PB(II) FROM AQUEOUS SOLUTION <i>Daniel Gang, University of Louisiana At Lafayette</i>	P3207-6 FATIGUE LIFE PREDICTION OF EPOXY COATING ON COMPOSITES SUBJECTED TO WATERDROP IMPACT <i>Ameya Kaore, Sardar Vallabhbhai National Institute of Technology, Surat</i> This paper presents a finite element model to predict the fatigue life of the epoxy coating on S-glass/epoxy composite against raindrop impact. The rainfall data for Mumbai region in India is used to simulate the fatigue loading. This model can be used to predict the fatigue life of wind turbine coatings subjected to rain erosion.		P3208-6 DAMPING OPTIMIZATION OF LAMINATED PLATES BASED ON COMPLEX MODULUS APPROACH <i>Masaki Kameyama, Shinshu University</i> This paper deals with the damping characteristics of symmetrically laminated plates. The concept of complex modulus and that of lamination parameters are introduced, where the complex stiffness invariants are newly proposed in this paper.	P3209-6 HYBRID NANOCOMPOSITE OF ZIF-67 AND COBALT-NICKEL LAYERED DOUBLE HYDROXIDE AS ELECTROCATALYST FOR HIGHLY EFFICIENT OXYGEN EVOLUTION REACTION <i>Feng Li, Beijing University of Chemical Technology</i> A three-dimensional CoNiAl-LDH/ZIF-67 nanocomposite exhibited excellent oxygen evolution reaction activity, due to unique hierarchical architecture with largely increased electrochemical active surface area, multi-porous framework, and intimate interfacial coupling effect.	P3210-6 MINIMIZATION OF THE OUT-OF-PLANE THERMAL DEFORMATION OF CFRP REFLECTORS BY STACKING SEQUENCE OPTIMIZATION <i>Shun Tanaka, Nagoya University</i> The effects of altering and optimizing the stacking sequence of CFRP laminates as a method to mitigate the out-of-plane thermal deformation due to fiber orientation error of space-based CFRP reflectors was investigated.	P3211-6 BIOCHAR: A POTENTIAL COMPOSITE CONSTITUENT <i>Qisik Das, Department of Fibre and Polymer Technology, KTH Royal Institute of Technology</i>	P3212-6 THE FABRICATION OF POLYLACTIC ACID (PLA) / CELLULOSE NANOFIBER (CNF) NANOCOMPOSITES WITH PLASTICIZER AS DISPERSING AGENT <i>Bich Nam Jung, Korea University / Korea Institute of Industrial Technology</i> In this study, Polylactic acid (PLA) / CNF nanocomposites were prepared by melt mixing method with triethyl citrate (TEC) as plasticizer.	P3214-6 SIMULATION OF THERMAL CONDUCTIVITY FOR TITANIUM BORIDE PARTICLE DISPERSED ALUMINUM COMPOSITES <i>Gen Sasaki, Hiroshima University</i>				

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1140-1145	<p>P3201-7 DEFORMATION MECHANISM INVESTIGATION FOR EPOXY BY IN-SITU MECH-ELECTRIC COUPLING MEASUREMENT <i>Yinggang Miao, Xi'an Jiaotong University</i></p> <p>Epoxy is modified with CNT which reinforces the conductivity of composites. Then mech-electric measurement of the composites are performed for analysing the potential deformation mechanism at the peak stress of epoxy materials.</p>	<p>P3202-7 KINKING MECHANICS IN COMPOSITES UNDER COMBINED LOADING <i>Sachin Vankar, Indian Institute of Technology Bombay</i></p> <p>An analytical approach has been developed for kinking mechanics under combined compression-torsion loading for unidirectional carbon fiber composite. A single fiber-matrix unit is considered by using a fiber deformation representation with fiber amplitude and fiber rotation.</p>	<p>MSC Software industry workshop</p> <p>*invitation only event*</p> <p>MULTI-SCALE MATERIAL MODELING WITH DIGIMAT TO SPEED-UP INNOVATION IN COMPOSITE MATERIAL AND PART DESIGN <i>Soumik Chakrabarty, Emilie Storms</i></p> <p>This workshop will run for 90 minutes</p> <p>Sponsored by</p> <p>MSC Software</p> <p>CONTINUED</p>	<p>P3204-7 IMPROVING THE STIFFNESS OF HIGH RESOLUTION DLP STEREOLITHO-GRAPHIC MATERIAL <i>Chow-Shing Shin, Department of Mechanical Engineering, National Taiwan University</i></p> <p>The Young's modulus of DLP stereolitho-graphic material can be increased markedly by decreasing the curing layer thickness and adding suitable concentration of CNT or alumina particles.</p>	<p>P3205-7 EFFECT OF FLAME RETARDANT FILTRATION ON THE FIRE PERFORMANCE OF CARBON FIBRE REINFORCED EPOXY COMPOSITES MADE BY RESIN TRANSFER MOULDING <i>Ákos Pomázi, Budapest University of Technology and Economics</i></p> <p>The effect of flame retardant filtration on the fire performance was investigated in case of carbon fibre reinforced low-viscosity epoxy composites made by liquid composite moulding techniques, such as resin transfer moulding.</p>	<p>P3206-7 LOW PERCOLATION THRESHOLD OF POLYPROPYLENE SPECIALLY DESIGNED GRAPHENE NANOCOMPOSITES <i>Karolina Gaska, Chalmers University of Technology</i></p> <p>This work presents industrially relevant melt-mixed system of polypropylene and hierarchically specially designed reduced graphene oxide. Exceptionally low electrical percolation threshold has been presented in this study.</p>	<p>P3207-7 TRIBOLOGICAL CHARACTERISTICS OF MICROWAVE PROCESSED KENAF/HDPE COMPOSITES UNDER DRY SLIDING WEAR <i>Manoj Kumar Singh, Indian Institute of Technology Mandi</i></p> <p>Tribological behaviour of microwave processed kenaf/HDPE composites were assessed using a pin-on-disc tribometer. The effect of the sliding speed was observed on the coefficient of friction and specific wear rate.</p>		<p>P3208-7 CLASSIFICATION AND PROPERTIES OF THREE-DIMENSIONAL TEXTILE PREFORMS <i>Zhenyu Ma, Nanjing University of Aeronautics and Astronautics</i></p> <p>In this paper, the 3D textile preforms were classified, and three representative geometric units (RGUs) were proposed, namely orthogonal geometric unit, skew geometric unit and curved geometric unit. Other units were combinations and derivations of these three RGUs.</p>	<p>P3209-7 GAMMA-RAY SHIELDING PROPERTY OF TUNGSTEN/BASALT FIBER REINFORCED EPOXY MATRIX COMPOSITES FABRICATED BY TWO TUNGSTEN HYBRID WAYS <i>Ran Li, Institute of Aerospace Material and Technology</i></p>	<p>P3210-7 VIBRATION FREQUENCY DESIGN AND STUDY OF COMPOSITE FUSELAGE STRUCTURE <i>Kaijian Wang, Beihang University</i></p>	<p>P3211-7 ADVANCED QUALIFICATION OF COMBOO - A BAMBOO BASED CORE MATERIAL <i>Andreas Loth, Beuth University of Applied Science</i></p>	<p>P3212-7 EVALUATION OF TENSILE PROPERTIES AND WATER ABSORPTION OF ABACA FIBER THERMOPLASTIC COMPOSITE RELATIVE TO FIBER LENGTH, TYPE OF MATRIX AND ADDITIVES <i>Marissa Paglicawan, Department of Science and Technology-Industrial Technology Development Institute</i></p> <p>Effects of abaca short fibers, milled fiber and woven fabric, NaOH treatment, maleic anhydride and nanoprecipitated calcium carbonate on the tensile properties and water absorption of the composites was studied.</p>	<p>Altair industry workshop</p> <p>RESEARCH MEETS PRACTICE - APPLYING MULTISCALE MODELING AND OPTIMIZATION IN COMPOSITES ENGINEERING <i>Markku Palanterä, Director of Global Composites Business Development</i></p> <p>This workshop will run for 90 minutes</p> <p>Sponsored by</p> <p></p> <p>CONTINUED</p>	<p>P3214-7 EVALUATION OF INTERFACIAL THERMAL RESISTANCE OF AL-ALN PARTICLE DISPERSED COMPOSITES BY USING IMAGE-BASED CALCULATION <i>Kenjiro Sugio, Hiroshima University</i></p> <p>Interfacial thermal resistance in Al-AIN composites was evaluated by comparing the measured thermal conductivity and the calculated thermal conductivity.</p>	<p>Mobility between Academia and Industry <i>Isabelle Paris, Bombardier</i></p> <p>Bridging the gap between education and employment <i>Tony Belcher, Boeing</i></p> <p>Modernising Composites Regulations <i>Ole Thomsen, Bristol University</i></p> <p>Increasing access for SMEs to international research <i>Matt Jevons, MT Aerospace</i></p> <p>This session aims to debate topics that cross between academia and industry in a close and less formal environment. Come an join our animators as we discuss key topics and identify ways forward. Each animator will represent a topic and visitors can move between individual topics or stay with one that particularly interests them.</p> <p>CONTINUED</p>		
																		1145-1150
1150-1155	<p>P3201-9 LINEAR AND NONLINEAR ELASTIC PROPERTIES OF POLYSTYRENE-BASED NANOCOMPOSITES <i>Irina Semenova, Ioffe Institute</i></p> <p>Polystyrene-based composites filled with particles of different type and shape were fabricated by melt technology. Their linear and nonlinear elastic properties were estimated.</p>	<p>P3202-9 QUASI STATIC COMPRESSIVE RESPONSE OF CFRP HONEYCOMB CORE WITH FOAM FILLERS <i>Hao Zhou, Nanjing University of Science and Technology</i></p> <p>CFRP honeycomb with PMI foam fillers was proposed as a hybrid sandwich core. The quasi static compressive response of the core was analyzed numerically.</p>		<p>P3204-9 EFFECTS OF CURE CYCLE PRESSURE PROFILE AND HEATING RATE ON PROPERTIES OF OUT-OF-AUTOCLAVE RAPIDLY CURED CARBON FIBRE COMPOSITES <i>Sima Kashi, Deakin University</i></p>	<p>P3205-9 PEFORMANCE MONITOR AND PREDICTION OF A BIAXIALLY LOADED THIN COMPOSITE TUBE <i>Md Shamsuddoha, University of New South Wales</i></p> <p>Compressive loading in conjunction with torsion of hollow composite tube is critical due to plastic micro buckling formed helically around the tube. This study aims to investigate behaviour of hollow composite tubes with round hole under combined torsion and compression loads, and compared with finite element analysis.</p>	<p>P3206-9 COBALT COPPER ALLOYS ENCAPSULATED BY MOS2/N-DOPED GRAPHENE NANO-HETERO-STRUCTURES FOR ORR APPLICATION <i>Nam Hoon Kim, Chonbuk National University</i></p> <p>In this work, a hybrid containing cobalt-copper alloys encapsulated 2D-molybdenum disulfide/nitrogen-doped graphene (CuCo@2D-MoS2/N-Gr) is synthesized by a simple thermal treatment and investigated as a catalyst for oxygen reduction reaction (ORR) in alkaline solution.</p>	<p>P3207-9 A CREEP MODEL FOR THE FATIGUE BEHAVIOR OF HYBRID BI-STABLE LAMINATE <i>Yangqi Li, Harbin Institute of Technology</i></p> <p>This work researchs the fatigue behavior of bistable laminate, gives the critical load changes with the number of cycles and presents a creep model to explain the attenuation range of the critical load.</p>		<p>P3208-9 BUCKLING ANALYSIS OF MULTILAYERED BEAMS WITH SOFT AND RIGID INTERFACES <i>An Le, University of Technology Sydney</i></p>	<p>P3209-9 HOW THE SPRAYING OF GRAPHENE NANOPLATELETS CHANGES MECHANICAL PROPERTIES OF CARBON FIBRE REINFORCED POLYMER? <i>Marzena Pawlik, University of Derby</i></p> <p>This study investigates the effects of graphene nanoplatelets, sprayed on the carbon fibre fabric, on flexural and interlaminar properties of CFRP composites.</p>	<p>P3210-9 A COMPUTATIONALLY EFFICIENT APPROACH FOR ANALYSING THE ONSET OF FAILURE IN AEROSPACE COMPOSITE STRUCTURES <i>Shibo Yan, The University of Nottingham</i></p>	<p>P3211-9 BAMBOO BASED BIO-COMPOSITES UNDER DAMAGED AND UNDamAGED FRACTURE <i>Wen Liu, Beijing Forestry University</i></p>	<p>P3212-9 THERMAL AND MECHANICAL BEHAVIOUR OF FLAX YARNS MODIFIED WITH GRAPHENE OXIDE <i>Farzin Javanshour, Tampere University</i></p> <p>In this work, the potential of graphene oxide treatment to improve flax-epoxy adhesion, increase in the thermal stability of flax fibres and their mechanical properties over 200 °C processing temperatures are studied.</p>	<p>P3214-9 A NOVEL W/TIN/TA COMPOUND SHAPED CHARGE LINER <i>ZiZhi Yan, Huazhong University of Science & Technology</i></p> <p>Mr Yan and his team have devoted themselves to the study of toughening technology of tungsten composites for many years, hoping to promote the application of tungsten in industry.</p>				


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Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211			Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
1155-1200	P3201-10 HIGH TEMPERATURE COMPRESSION PROPERTIES OF CFF/PPS COMPOSITE LAMINATES FABRICATED BY FILM STACKING TECHNIQUE <i>Shixun Wang, Beijing Institute of Astronautical Systems Engineering</i>	P3202-10 ELECTROMECHANICAL RESPONSE OF MULTIFUNCTIONAL PIEZOELECTRIC COMPOSITES <i>Krishna Challagulla, Laurentian University</i> The present work extends the previous study by the authors on piezoelectric foam structures to multifunctional composite structures by enclosing the foam structures with symmetric interconnect made of PZT-7A (acts as first phase) within piezoelectric materials (acts as second phase); (i) barium titanate (BaTiO3), and relaxor ferroelectrics (PMN-33%PT) (ceramic-ceramic piezoelectric composites), and (ii) polyvinylidene fluoride (PVDF) (ceramic-polymer piezoelectric composites).	MSC Software industry workshop *invitation only event* MULTI-SCALE MATERIAL MODELING WITH DIGIMAT TO SPEED-UP INNOVATION IN COMPOSITE MATERIAL AND PART DESIGN <i>Soumik Chakrabarty, Emilie Storms</i> This workshop will run for 90 minutes Sponsored by  CONTINUED	P3204-10 HIGLY AUTOMATED MANUFACTURING PROCESS OF LARGE AIRPLANE CFRP STRCTURES <i>Marcin Malecha, German Aerospace Center</i> We present automated approach for manufacturing of large aircraft structures made of dry non-crimped carbon fabrics from material logistics to vacuum bagged preform in a single smart process.	P3205-10 INTRA-LAMINAR AND INTER-LAMINAR PROGRESSIVE FAILURE ANALYSIS OF AFP COMPOSITE ON A TOW LEVEL <i>Xie Li, University of New South Wales</i> A tow level numerical modelling technique has been introduced to more precisely capture the progressive failures of AFP composite with the inclusion of process-induced defects.	P3206-10 COBALT PHOSPHIDES COATED COPPER OXIDE NANOROD ARRAYS FOR ENHANCED OVERALL WATER SPLITTING <i>Joong Hee Lee, Chonbuk National University</i> Herein, we report the cost-effective fabrication of cobalt phosphides coated copper oxide nanorod arrays supported 3D foam (Co2P@CuO NR/CF) as an efficient electrocatalyst for overall water splitting in alkaline condition.	P3207-10 SHORT-TIME APPROACH FOR FATIGUE LIFE ESTIMATION OF MULTIFUNCTIONAL COMPOSITES <i>Sebastian Backe, TU Kaiserslautern</i> A newly developed short-time approach for fatigue life estimation of multifunctional composite laminates based on single load increase tests is introduced.			P3209-10 CFRP-STEEL HYBRIDS WITH IMPROVED AGEING RESISTANCE THROUGH ZINC OXIDE NANORODS - INVESTIGATION OF BASIC MECHANISMS <i>Jan Striewe, Paderborn University</i> Investigations on the mode of action and influence of an innovative wet-chemical surface pre-treatment of steel substrates on the ageing resistance of hybrids made of steel and carbon fibre-reinforced plastic.	P3210-10 SIMULATION AND EXPERIMENTS FOR MECHANICAL PROPERTIES DOMINATING THE PRESS MOLDING USING CFRTF PREFORMS <i>Yuji Abo, Kyoto University</i> The press molding using CFRTF attracts attention to reduce production times. The pull-out and shear property of CFRTF preforms were examined, and models for preforming simulation were made.	P3211-10 CHARACTERIZATION AND THERMAL EFFECT ON MECHANICAL PROPERTIES OF BIOMATERIAL-REINFORCED-POLYPROPYLENE <i>Anh Dung Ngo, École De Technologie Supérieure</i>	P3212-10 GREEN AND NATURAL FIBRE PANEL COMPOSITES FROM BAMBOO-A MATERIAL OF THE FUTURE <i>Uday Nagammanavar, IPIRTI</i> IPIRTI has developed number of bamboo based structural products like Bamboo Mat Board (BMB), as alternative to plywood, Bamboo Mat Corrugated Sheet (BMCs) as alternative to corrugated roofing sheets,Bamboo Flooring Tiles,Bamboo Particle/Fibre Boards.	Altair industry workshop RESEARCH MEETS PRACTICE - APPLYING MULTISCALE MODELING AND OPTIMIZATION IN COMPOSITES ENGINEERING <i>Markku Palanterä, Director of Global Composites Business Development</i> This workshop will run for 90 minutes Sponsored by  CONTINUED	P3214-10 STRENGTHENING OF PURE AL MATRIX COMPOSITES BY IN-SITU SYNTHESIZED NANO AL-O NEEDLE PHASE <i>Xinxin Zhu, Southwest Jiaotong University</i> The in-situ Al matrix composites were synthesized by mechanical milling followed by oscillatory press sintering, producing an excellent mechanical properties both at ambient and elevated temperatures.	Mobility between Academia and Industry <i>Isabelle Paris, Bombardier</i> Bridging the gap between education and employment <i>Tony Belcher, Boeing</i> Modernising Composites Regulations <i>Ole Thomsen, Bristol University</i> Increasing access for SMEs to international research <i>Matt Jevons, MT Aerospace</i> This session aims to debate topics that cross between academia and industry in a close and less formal environment. Come an join our animators as we discuss key topics and identify ways forward. Each animator will represent a topic and visitors can move between individual topics or stay with one that particularly interests them. CONTINUED	
																	1200-1205
1205-1210		P3202-12 EXPERIMENTAL CHARACTERIZATION AND MODELLING OF MECHANICAL BEHAVIOR OF MICROCAPSULES IN COMPOSITES <i>Andrey Aniskevich, University of Latvia</i> Mechanical behavior of single microcapsule and embedded in polymer matrixes was investigated experimentally and modelled analytically and numerically.		P3204-12 IMPREGNATION PROCESS IN OPEN MOLDING METHOD USING MULTI-FILAMENT WINDING <i>Kazuma Otake, Gifu University</i> In this study, the heater position and the heating temperature were changed, and the impregnated states of the molds were compared and evaluated by observing the cross section, and the heating condition was examined.		P3206-12 ANALYSES OF MECHANICAL REINFORCEMENT FOR CELLULOSE NANOFIBERS/CLAY NANOCOMPOSITES USING X-RAY DIFFRACTION <i>Shunichi Mori, Kobe University</i> We employed cellulose nanofiber (CNF) as a matrix and montmorillonite (MMT) as a filler, then prepared CNF/MMT nanocomposites. The mechanical reinforcement effect based-on interfacial interaction between CNF and MMT was investigated by "X-ray diffraction method".	P3207-12 INVESTIGATION ON HOMOTHETIC FAILURE ENVELOPES IN THE LAYER-BASED FATIGUE ANALYSIS OF CFRP <i>Marc Möller, Technische Hochschule Köln</i> The present paper mainly deals with the design of homothetic fatigue failure envelopes under multiaxial cyclic stresses for residual strength based fatigue analyses.			P3210-12 PRESS AND INJECTION HYBRID MOLDING OF GF/PP HAT-SHAPED MEMBER AND EVALUATION OF ITS BENDING PROPERTY <i>Kazuto Tanaka, Doshisha University</i> The bending properties of hybrid molded GF/PP hat-shaped member were evaluated and FEM analysis was carried out to clarify the relationship between material cost and mechanical properties.		P3212-12 RESEARCH ON COMBUSTION BEHAVIOR OF HYBRID COMPOSITE BY FIRE DYNAMICS SIMULATOR <i>Yoon Hee Park, Changwon National University</i> As a result, some errors are generated, but the combustion behavior is similar. Research is needed to accurately implement factors and surroundings that affect ignition time and behavior in order to reduce errors.					
1210-1215		P3202-13 SMART MECHANOLUMINESCENT SHAPE MEMORY FILM FOR FLEXIBLE STRESS SENSING <i>Yang He, Harbin Institute of Technology</i>		P3204-13 PROGRESS IN STRUCTURAL TAILORED POLYMER INSERTS; TRENDS AND STRATEGIES TOWARDS FUNCTIONAL POLYMERIC INTER-PLY REINFORCEMENTS <i>Sithila Themnimulla, Deakin University</i> The world of smart materials offers a progress towards a more intelligent materials design philosophy. This work examines progress in the utilisation of modified thermoplastic additives as multifunctional strain sensing elements.		P3206-13 PREPARATION OF FLUOROALKYL END-CAPPED OLIGOMER/MAGNETITE NANOCOMPOSITES - APPLICATION TO WATER/OIL SEPARATION <i>Hideo Sawada, Hiroskai University</i> Fluoroalkyl end-capped vinyltrimethoxysilane oligomer/magnetite composites, which were prepared by composite reaction of the corresponding oligomer with magnetite, can adsorb effectively oil droplets spread on the water interface under a magnetic field.	P3207-13 CRUCIFORM SPECIMEN DESIGNS FOR PLANAR BIAXIAL FATIGUE TESTING IN COMPOSITES <i>Aakash Moncy, Technical University of Denmark</i> Usage of composite cruciform specimens for planar-biaxial fatigue testing are evaluated using finite element analysis for their uniformity in the stress and the strain state in their biaxial zones.			P3210-13 DESIGN AND ANALYSIS OF COMPOSITE CARBON FIBER REINFORCED ANTI-COLLISION BEAM BASED ON ANSYS ACP <i>Chuanxiang Zheng, Zhejiang University</i>		P3212-13 TUBE MADE FROM POLYLACTIC ACID YARN AND SILK YARN BY FILAMENT WINDING TECHNIQUE <i>Natee Srisawat, Rajamangala University of Technology Thanyaburi</i>					


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1215-1220		<p>P3202-14 DAMAGE DETECTION USING DIRECT-WRITE PIEZOELECTRIC TRANSDUCERS AND LAMB WAVES IN COMPOSITE MATERIALS <i>Marilyne Philibert, IMRE, A*STAR, Singapore</i></p> <p>The objective is to apply direct-write transducers on CFRP plate for active sensing of impact damage by using non-ceramic P(VDF-TrFE) with an electrode patterned for mode selection.</p>	<p>MSC Software industry workshop</p> <p>*invitation only event*</p> <p>MULTI-SCALE MATERIAL MODELING WITH DIGIMAT TO SPEED-UP INNOVATION IN COMPOSITE MATERIAL AND PART DESIGN <i>Soumik Chakrabarty, Emilie Storms</i></p> <p>This workshop will run for 90 minutes</p> <p>Sponsored by</p>			<p>P3206-14 CARBON DOT/ POLYPYRROLE NANOPARTICLE COMPLEXES AS MULTIFUNCTIONAL THERANOSTIC AGENTS <i>Tae Eun Kim, Inje University</i></p> <p>In this study, carbon dots are combined with the polypyrrole nanoparticles to make a novel PTT-imaging agent. The complexes can be utilized as theranostic agents by monitoring in real time.</p>								<p>Altair industry workshop</p> <p>RESEARCH MEETS PRACTICE - APPLYING MULTISCALE MODELING AND OPTIMIZATION IN COMPOSITES ENGINEERING <i>Markku Palanterä, Director of Global Composites Business Development</i></p> <p>This workshop will run for 90 minutes</p> <p>Sponsored by</p>		<p>Mobility between Academia and Industry <i>Isabelle Paris, Bombardier</i></p> <p>Bridging the gap between education and employment <i>Tony Belcher, Boeing</i></p> <p>Modernising Composites Regulations <i>Ole Thomsen, Bristol University</i></p> <p>Increasing access for SMEs to international research</p>	
1220-1225		<p>P3202-15 INFLUENCE OF OPTICAL FIBER SENSOR PLACEMENT ON CFRP LAMINATES FOR PROCESS AND STRUCTURAL HEALTH MONITORING <i>Helena Rocha, University of Minho</i></p> <p>We studied the influence of embedded optical fibers on the mechanical properties of CFRPs. OF with FBG sensors were used for cure monitoring and detection of barely visible impact damage.</p>	<p>MSC Software</p> <p>CONTINUED</p>			<p>P3206-15 CARBON QUANTUM DOTS USING POLYPHENOL COMPOUNDS:SKIN ANTI-AGING <i>SeokWon Park, Inje University</i></p> <p>In this study, carbon quantum dots are synthesized using polyphenol compounds. We confirmed the applicability of carbon quantum dots as an anti-aging substance.</p>									<p> Altair</p> <p>CONTINUED</p>		<p><i>Matt Jevons, MT Aerospace</i></p> <p>This session aims to debate topics that cross between academia and industry in a close and less formal environment. Come an join our animators as we discuss key topics and identify ways forward. Each animator will represent a topic and visitors can move between individual topics or stay with one that particularly interests them.</p>
1225-1230		<p>P3202-16 STRAIN SENSING OF EPOXY RESIN USING POROUS CARBON NANOTUBE/ GRAPHENE COMPOSITE BUCKYPAPER <i>Guangming Yang, Tongji University</i></p> <p>Porous Carbon nanotube/Graphene Buckypapers are fabricated for strain sensing of epoxy resin. The obtained strain gauges exhibited a high GF of 10.83, high linearity (R2 =0.987) and good cycle stability.</p>				<p>P3206-16 MELT ELECTROSPINNING: AN ECO-FRIENDLY WAY OF NANOFIBER AND GRAPHITIZED FIBRE PREPARATIONS USING NANOCELLULOSE <i>Haoyi Li, Beijing Chemical Technology University</i></p>											CONTINUED
1230-1235		<p>P3202-17 MULTIFUNCTIONAL STRUCTURAL ENERGY STORAGE COMPOSITES <i>Feng Huang, University of New South Wales</i></p> <p>New structural concepts for composite batteries will be developed to store electrical energy, without sacrificing mechanical strength and stiffness. Examples include designing new energy storage cores for sandwich structures using either supercapacitor or laminated battery techniques.</p>				<p>P3206-17 MULTILEVEL RESISTIVE SWITCHING IN NANO SILVER INCORPORATED CHITOSAN THIN FILMS <i>Sreedevi Vallabhapurapu, University of South Africa</i></p> <p>Nano silver incorporated Chitosan thin films were prepared by simple spin coating. Our careful I-V measurements shows multilevel switching characteristics of the chitosan and silver film for one layer.</p>											
1235-1240						<p>P3206-18 IN VITRO STUDY OF A NOVEL BIOFUNCTIONALIZATION FOR 3D PDMS SCAFFOLD VIA SURFACE MODIFICATION <i>Baek Ji Hun, Hanam University</i></p> <p>We fabricated PDMS nanosheets using electrospinning. Then, PDMS nanosheets surface were modified with a biocompatible material that stimulates cell proliferation and differentiation.</p>											


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1240-1345	Lunch Exhibition hall																
1250-1340	<div>ICCM22 Women in Composites Leadership Forum</div> <div>Collette Burke, Victorian Chief Engineer</div> <div>Chiara Bisagni, TU Delft</div> <div>Michelle Gee, RMIT</div> <div>Stefanie Feih, A*STAR</div> <div>Jennifer Conley, Advanced Fibre Cluster</div> <div>Meeting room 212</div> <div></div>																
1300-1345	<div>NETZSCH Industry roundtables - Current and Future Challenges of Composite Manufacturing</div> <div>"invitation only event"</div> <div>Alexander Chaloupka, NETZSCH Analyzing and Testing, Germany</div> <div>Andrew Gillen, NETZSCH Analyzing and Testing, Australia</div> <div></div>																
1345-1430	PLENARY LECTURE: COMPOSITES 4.0: FROM DESIGN TO AUTOMATED MANUFACTURING <i>Peter Middendorf, University of Stuttgart, Germany</i> Plenary 2																
1430-1440	Move to concurrent rooms																
1440-1600	3301 Nano-composites	3302 Biocomposites	3303 Self-healing	3304 Liquid composites moulding	3305 Additive manufacturing	3306 Composite structures	3307 Multiscale modelling			3308 Textile-based composites	3309 Fracture and damage	3310 Design and integration	3311 Defence	3312 Testing methods	3313 Damage tolerance	3314 Fatigue	3315 Metal matrix composites
1440-1500	3301-1 PERFORMANCE OF GRAPHENE/ EPOXY DIAPHRAGM HEADPHONES <i>Hsien-Kuang Liu, Dept. of Mechanical and Computer Aided Engineering, Feng Chia University</i> Graphene oxide paper (GOP) headphone possesses highest SPL value 98 dB at first resonant frequency 430 Hz, while the GOP composite headphone has smoother SPL curve in higher frequency range.	3302-1 INVESTIGATION OF NOVEL FIRE RETARDANT POLYFURFURYL ALCOHOL (PFA) BIO-COMPOSITE MATERIAL <i>Tahir Sharif, University of Derby</i> Polyfurfuryl alcohol (PFA) bioresein is a biological and sustainably sourced thermosetting polymer with excellent natural fire resistance. This study investigates the mechanical, thermal and fire retardant properties of this material, as composite prepreg, in autoclave and oven cure processes.	3303-1 DAMAGE PROGRESSION ANALYSIS OF SELF-HEALING POLYMER COMPOSITES CONTAINING MICROCAPSULES <i>Yasuka Nassho, Toyama Prefectural University</i> Three-dimensional finite element analysis was performed using a representative volume element model to predict damage progression behavior of spread carbon fiber/epoxy laminates containing microcapsules.	3304-1 MULTI SCALE SIMULATION OF FLOW IN DRY FIBER PLACEMENT PREFORMS <i>Oliver Rimmel, Institut für Verbundwerkstoffe GmbH</i> The present work deals with application of a numerical solver to random fibre arrangements to determine micro permeability transverse to the fibre orientation, for later use in meso- and macro scaled models.	3305-1 FIBRE LENGTH AT DIFFERENT STAGES OF ADDITIVELY MANUFACTURED SHORT FIBRE REINFORCED COMPOSITES <i>Lizhe He, University of Nottingham Ningbo China</i> This study investigates the in-plane localised crushing responses of carbon fibre reinforced epoxy (CF/EP) composite sandwich panels under a semi-circular indenter subjected to both quasi-static and dynamic loadings.	3306-1 EXPERIMENT AND PREDICTION OF IN-PLANE LOCALISED CRUSHING RESPONSES OF CF/EP COMPOSITE SANDWICH PANELS UNDER A SEMICIRCULAR INDENTER <i>Yuan Chen, The University of Sydney</i> This study investigates the in-plane localised crushing responses of carbon fibre reinforced epoxy (CF/EP) composite sandwich panels under a semi-circular indenter subjected to both quasi-static and dynamic loadings.	3307-1 MICROMECHANICAL MODELLING OF DENSELY PACKED SYNTACTIC FOAM COMPOSITES <i>Declan Carolan, Fac Technology</i> The presentation deals with a micromechanical homogenisation of the effective elastic properties of AP-PLY composites using a meshfree based modelling approach.		3308-1 STUDY OF THE EFFECT OF IN-PLANE BRAID DISTORTIONS ON THE MECHANICAL PROPERTIES OF BRAIDED COMPOSITES USING STOCHASTIC TOOLS AND FINITE ELEMENT MODELLING <i>Mayank Gautam, University of Manchester</i> Three types of braided composites each with different in-plane distortions, with a mean braid angle of 45° braid angle have been produced, to the study the effect of in-plane distortions on the tensile behaviour (in axial direction) of braid composites.	3309-1 DAMAGE CHARACTERISATION OF COMPOSITE COMPONENTS USING FULL-FIELD IMAGING TECHNIQUES <i>Irene Jimenez Fortunato, University of Southampton</i> Thermoelastic Stress Analysis (TSA) and Digital Image Correlation (DIC) full-field imaging techniques are applied simultaneously on a complex composite substructure subjected to cyclic loading to provide a damage parameter.	3310-1 MULTIFUNCTIONAL COMPOSITES FOR SENSING, ACTUATION, COMPUTATION AND STRUCTURAL POWER: AIR FORCE PERSPECTIVE <i>Dan Inman, University of Michigan</i> This study evaluated the ballistic performance of a range of polymer ceramic/S2-Glass armour systems; comparing polymer ceramic strike face and embedding the ceramic powder within a phenolic matrix FRP composite.	3311-1 INTEGRATED HYBRID CERAMIC/ S2-GLASS FIBRE REINFORCED COMPOSITE ARMOUR <i>Ali Daliri, Defence Science and Technology Group</i> To verify the stability of pressure vessel, this paper deals with the development of a new segment-type ring burst test device.	3312-1 EVALUATION OF MECHANICAL PROPERTIES OF COMPOSITE PRESSURE VESSELS USING A SEGMENT-TYPE RING BURST TEST DEVICE <i>Woetae Kim, Kaist</i> The Regularized-Extended Finite Element Method was used to perform discrete damage modeling of impact-induced delamination and matrix cracks in the scope of compression after impact analysis.	3313-1 COMPRESSION STRENGTH AFTER IMPACT ANALYSIS USING DISCRETE DAMAGE MODELING <i>Jeffrey McQuien, University of Texas at Arlington Research Institute</i> A new constant life diagram (CLD) model featuring asymmetric bilinear constant-life curves was proposed to better describe the longitudinal fatigue behavior of unidirectional laminae (UD) under a wide range of stress ratios.	3314-1 A NEW CONSTANT LIFE DIAGRAM MODEL FOR UD LONGITUDINAL FATIGUE <i>Fangfang Li, Shanghai Polytechnic University</i> We propose an inverse-nacre structure which the flaky soft phases are embedded in a hard matrix, to evade the trade-off between strength and ductility.	3315-1 EVADING STRENGTH AND DUCTILITY TRADE-OFF IN BIO-INSPIRED HIERARCHICAL MAGNESIUM-BASED NANOCOMPOSITE <i>Xi Luo, Southwest Jiaotong University</i>	
1500-1520	3301-2 LOW FIELD MICROWAVE ABSORPTION AND MAGNETO RESISTANCE IN PANI-FE NANO FIBRE COMPOSITES <i>Viaya Srinivasu Vallabhapurapu, University of South Africa</i> Low field microwave absorption (LFMA) in various systems, namely, Superconductors, magnetic materials and polymer composites is totally different. here we report on the LFMA in Fe nano particle (Nps) embedded PANI nano fibers.	3302-2 MECHANICAL PROPERTY CHARACTERIZATION AND TRANS-SCALE MODELING FOR NACRE <i>Jingru Song, Institute of Mechanics Chinese Academy of Sciences</i> The hierarchical structures of nacre are observed and a trans-scale model is used to describe its mechanical behavior by the nanoindentation test and fracture toughness test.	3303-2 DESIGN OF COMPOSITE PROPELLER BLADE OF TURBOPROP AIRCRAFT CONSIDERING ON SELF HEALING <i>Hyunbum Park, Howon University</i> In this study, aerodynamic and structural design of the composite propeller blade for a regional turboprop aircraft is performed. The self-healing concept for developed propeller was studied.	3304-2 KEY ASPECTS IN MANUFACTURING MULTI-SCALE COMPOSITES USING OOA RFI <i>Francois Robitaille, University of Ottawa</i> Proposed and investigated a practical method to characterize fusion quality of 3D printed polymer composites, i.e. to conduct DENT tests to determine the specific essential work of fracture of single layer film.	3305-2 CHARACTERISATION OF FUSION QUALITY BETWEEN FILAMENTS BY FDM USING ESSENTIAL WORK OF FRACTURE <i>Qinghao He, School of Aerospace, Mechanical and Mechatronic Engineering</i> CNT was sprayed on spread CF tow and mechanical properties of CF/Nano-PET composites was enhanced.	3306-2 EFFECT OF SPREAD CARBON FIBER TOW ON THE MECHANICAL PROPERTIES OF THE CF/NANO-PET COMPOSITES <i>Yeon-Taek Hwang, Hanyang University</i> The presentation deals with a micromechanical homogenisation of the effective elastic properties of AP-PLY composites using a meshfree based modelling approach.	3307-2 A MESHFREE-BASED MODELLING APPROACH FOR PREDICTING THE EFFECTIVE PROPERTIES OF AP-PLY COMPOSITE LAMINATES <i>Yanhong Chen, University of Oxford</i> This study examined lightning strike damage behaviours of CFRP under atmospheric pressure air and reduced pressure air to evaluate the effect of atmospheric environment on lightning damage behaviour.		3308-2 INFLUENCE OF RESIN ON INTRAPLY SHEAR BEHAVIOR IN PREPREG FABRIC FORMABILITY <i>Muhammad Khan, WMG, The University of Warwick</i> This study examined lightning strike damage behaviours of CFRP under atmospheric pressure air and reduced pressure air to evaluate the effect of atmospheric environment on lightning damage behaviour.	3309-2 EXPERIMENTAL STUDY OF LIGHTNING DIRECT EFFECTS ON CFRP UNDER ATMOSPHERIC PRESSURE AIR AND REDUCED PRESSURE AIR <i>Shintaro Kamiyama, Tokyo University of Agriculture and Technology</i> This study examined lightning strike damage behaviours of CFRP under atmospheric pressure air and reduced pressure air to evaluate the effect of atmospheric environment on lightning damage behaviour.	3310-2 CURRENT AND FUTURE TRENDS IN MULTIFUNCTIONAL COMPOSITES RESEARCH: A NATIONAL SCIENCE FOUNDATION PERSPECTIVE <i>Siddiq Qidwai, National Science Foundation</i> A review of the main test types and associated fixtures used to determine the bulk properties of composite laminates.	3311-2 PROTECTION PROPERTIES OF BI-CORRUGATED SANDWICH STRUCTURES UNDER HYPER-VELOCITY IMPACT: NUMERICAL SIMULATION <i>Rui Guo, Nanjing University of Science and Technology</i> A multi-scale framework has been developed for the numerical modelling of composite laminates reinforced with z-pins and submitted to several delaminations of different mode-mixities.	3312-2 A REVIEW OF MECHANICAL TESTING OF COMPOSITE LAMINATES <i>Ian McEnteggart, Instron</i> A review of the main test types and associated fixtures used to determine the bulk properties of composite laminates.	3313-2 AN ENERGY-EQUIVALENT COHESIVE LAW FOR MODELLING Z-PINNED COMPOSITE LAMINATES <i>Antonio Melro, Bristol Research Institute</i> Fatigue damage analysis of composite laminates under variable amplitude loads is presented using two different analytical methodologies, namely: i) Piecewise Constant Life Diagrams (PCLD) in combination with Miners damage sum; ii) PCLD with a progressive damage model. The obtained analytical results are compared with the experimental spectral fatigue results.	3314-2 EXPERIMENTAL INVESTIGATION OF THE DAMAGE AT THE TIP OF TUNNELING CRACK IN GLASS FIBRE COMPOSITES <i>Ashish Kumar Bangaru, Technical University of Denmark</i> An automated dispersion analysis technique is proposed to quantify reinforcement dispersion in metal matrix composites with minimized human interruption by integrating image processing, statistical analysis, and computational intelligence.	3315-2 METAL INJECTION MOLDING OF CU/CF COMPOSITES <i>Toshiko Osada, Tokyo Metropolitan University</i> Cu/CF composites were fabricated thorough MIM process. Effects of fiber contents and fiber orientation on the mechanical properties were investigated.	
1520-1540	3301-3 DEVELOPMENT OF DIELECTRIC ELASTOMER NANOCOMPOSITES AS STRETCHABLE ACTUATING MATERIALS <i>Lizhi Sun, University of California, Irvine</i> Dielectric elastomers (DEs) are a new type of smart materials showing promising functionalities as energy harvesting materials as well as actuating materials for potential applications such as artificial muscles, implanted medical devices, robotics, and micro-electro-mechanical systems due to their high electromechanical efficiency, stability, lightweight, low cost, and easy processing.	3302-3 POTENTIAL OF APPLYING PULTRUSION FOR THE MANUFACTURING OF BIO-BASED COMPOSITE PROFILES USING CELLULOSE FIBRE AND ALIPHATIC POLYURETHANE <i>Sebastian Strauss, Fraunhofer IGCV</i> A one-shot-hybrid RTM process for multi material hybrid parts is the basis to demonstrate a strategy how to generate data for models used for an inline process optimization.	3303-3 METALLIC MICRO-ENCAPSULATION: A DIRECT PATH TO NOVEL MULTIFUNCTIONAL MATERIALS <i>Jinglei Yang, Hong Kong University of Science and Technology</i> In this paper, a biomimetic porous ceramic catalyst carrier was prepared by powder bed fusion technology.	3304-3 MODEL BASED PROCESSING OF HYBRID RTM PARTS <i>Ralf Schledjewski, Montanuniversität Leoben</i> Stringer-stiffened composite panels assessed by ultrasonic guided waves show strong correlation to damage features as imaged by other NDE techniques (x-Ray CT, ultrasonic), as well as to residual strength.	3305-3 STUDY ON 3D PRINTING AND PROPERTIES OF COMPOSITE CATALYST CARRIERS WITH BIOMIMETIC POROUS STRUCTURE <i>Cunbao Huo, State Key Laboratory of Manufacturing Systems Engineering, Xi'an Jiaotong University</i> In this paper, a biomimetic porous ceramic catalyst carrier was prepared by powder bed fusion technology.	3306-3 GUIDED WAVE NDE AND RESIDUAL STRENGTH OF COMPOSITE PANELS WITH STIFFENER IMPACT DAMAGE <i>Hyonny Kim, UC San Diego</i> This study presents dynamic fracture investigations exploring innate toughening of DGEBA (epoxy-based) resins via heterogeneous and homogeneous additives for improvement in high performance composite systems.		3308-3 INFLUENCES OF PROJECTILE MATERIALS ON IMPACT RESISTANCE OF 2D TRIAXIAL BRAIDED COMPOSITES <i>Lulu Liu, College of Energy and Power Engineering, Nanjing University of Aeronautics and Astronautics</i> In the current paper, three types of projectile, including cylinder gelatin projectile, CFRP blade-like projectile and titanium alloy projectile, were employed to conduct ballistic impact tests on the 2D triaxial braided composites to figure out the influences of projectile materials on the damage pattern and energy absorption behavior.	3309-3 THE ROLE OF HOMOGENEOUS AND HETEROGENEOUS TOUGHENING MECHANISMS IN DGEBA FRACTURE <i>Leslie Lamberson, Drexel University</i> This study presents dynamic fracture investigations exploring innate toughening of DGEBA (epoxy-based) resins via heterogeneous and homogeneous additives for improvement in high performance composite systems.	3310-3 DISTRIBUTED SENSING, ACTUATION, AND POWER IN SOFT COMPOSITE MATERIALS <i>Robert Shepherd, Cornell University</i> This study presents dynamic fracture investigations exploring innate toughening of DGEBA (epoxy-based) resins via heterogeneous and homogeneous additives for improvement in high performance composite systems.	3311-3 OBSERVING THROUGH-THICKNESS DAMAGE TIMELINE IN THICK-SECTION MONOLITHIC COMPOSITES UNDER IMPACT LOAD <i>Ignacio Vidal Perez, Technical University of Denmark</i> A multi-scale framework has been developed for the numerical modelling of composite laminates reinforced with z-pins and submitted to several delaminations of different mode-mixities.	3312-3 FULL FIELD STRAIN MEASUREMENT OF BRAIDED COMPOSITE STRUCTURES WITH VARIABLE THICKNESS <i>Joel Serra, UTC Composites - University of Bristol</i> Fatigue damage analysis of composite laminates under variable amplitude loads is presented using two different analytical methodologies, namely: i) Piecewise Constant Life Diagrams (PCLD) in combination with Miners damage sum; ii) PCLD with a progressive damage model. The obtained analytical results are compared with the experimental spectral fatigue results.	3313-3 Z-PIN THROUGH-THICKNESS ENHANCEMENT OF A COMPOSITE LAMINATE WITH VARIABLE THICKNESS <i>Garrett Melenka, York University</i> A multi-scale framework has been developed for the numerical modelling of composite laminates reinforced with z-pins and submitted to several delaminations of different mode-mixities.	3314-3 DESIGN OF COMPOSITE STRUCTURE UNDER VARIABLE AMPLITUDE FATIGUE LOADS USING LOCAL LAMINATE LIFE PREDICTIONS <i>Subbareddy Daggumati, IIT Indore</i> Fatigue damage analysis of composite laminates under variable amplitude loads is presented using two different analytical methodologies, namely: i) Piecewise Constant Life Diagrams (PCLD) in combination with Miners damage sum; ii) PCLD with a progressive damage model. The obtained analytical results are compared with the experimental spectral fatigue results.	3315-3 QUANTITATIVE ANALYSIS OF REINFORCEMENT DISPERSION IN METAL MATRIX COMPOSITES <i>Byeongjin Park, Korea Institute of Materials Science</i> An automated dispersion analysis technique is proposed to quantify reinforcement dispersion in metal matrix composites with minimized human interruption by integrating image processing, statistical analysis, and computational intelligence.		


WEDNESDAY 14 AUGUST																	
Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211			Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
1540-1600	3301-4 EXFOLIATION AND FUNCTIONALIZATION OF MXENE: EFFECTIVE FLAME RETARDANT AND REINFORCEMENT FOR THERMOPLASTIC POLYURETHANE ELASTOMER <i>Wei Yang, University of New South Wales</i>	3302-4 TOUGH BIO-INSPIRED CERAMIC COMPOSITES FOR AMBIENT AND HIGH TEMPERATURE APPLICATIONS <i>Behnam Ashrafi, National Research Council Canada</i>		3304-4 PROPERTIES OF POLYAMIDE-6 COMPOSITES USING THERMOPLASTIC RESIN TRANSFER MOULDING <i>James Murray, University of Edinburgh</i>	3305-4 DEVELOPING HIGH TEMPERATURE - HIGH PERFORMANCE GF/PEKK THERMOPLASTIC PREPREGS <i>Zhongwei Guan, University of Liverpool</i>	3306-4 EFFECT OF MATRIX CRACKS ON THE STIFFNESS DEGRADATION OF LAMINATED COMPOSITE BEAMS <i>Oscar Gerardo Castro Ardila, Denmark</i>					3309-4 IN SITU MICRO-CT IMAGING OF COMPRESSION LOADED CARBON FIBRE REINFORCED POLYMER SPECIMENS WITH VOIDS AND WRINKLES <i>Abhiram Ramesh, University of Auckland</i>	3310-4 MECHANICAL PROPERTIES OF MULTIFUNCTIONAL SANDWICH COMPOSITES WITH EMBEDDED LITHIUM-ION POLYMER BATTERIES <i>Adam Best, CSIRO</i>		3312-4 EXPERIMENTAL DETERMINATION OF STATISTICAL CORRELATION BETWEEN FRP ELASTIC PROPERTIES <i>Shufeng Zhang, National University of Defense Technology</i>	3313-4 EXPERIMENTAL EXAMINATION ON THE HIGH-SPEED BALLISTIC IMPACT FAILURE BEHAVIOR OF LAMINATED AND TEXTILE COMPOSITE PANELS <i>Chao Zhang, Northwestern Polytechnical University</i>	3314-4 FATIGUE BEHAVIOR OF UN-NOTCHED AND OPEN-HOLE QUASI-ISOTROPIC PSEUDO-DUCTILE THIN-PLY CARBON/GLASS HYBRID LAMINATES <i>Meisam Jalalvand, University of Strathclyde</i>	3315-4 COST-EFFECTIVE SYNTHESIS OF COPPER/DIAMOND COMPOSITE WITH ACCEPTABLE THERMOPHYSICAL PROPERTIES <i>Fei Yang, University of Waikato</i>
		This work demonstrates how a bio-inspired approach based on architected designs and lamination could address the britttest of ceramic structures.	Thermoplastic composite laminates with ~53% fibre volume fraction, ~1% voids volume fraction and excellent mechanical properties were produced using a bespoke low-cost TP-RTM system within 5 minutes using only a 4 bar injection pressure.	A test rig has been developed to produce glass fibre/PEKK prepregs. Through the resin bath nanomaterials can be added to impregnate the fibre. Also fibre content can be controlled.	CFRP specimens extracted from curved regions containing voids and wrinkles were tested using a novel compression fixture, allowing for in situ X-ray μ -CT scans under several load steps to determine the type and evolution of damage.							A methodology is proposed to experimental determination of statistical correlation between FRP elastic properties by a combination of digital image correlation and virtual field methods.	The high-speed impact behavior of composite laminates, woven composites and triaxially braided composites were studied experimentally and systematically compared, with the introduction of digital image correlation, C-scan and X-ray CT characterizations.		It is feasible and cost-effective to use induction heating plus forging to produce copper/diamond composites with acceptable thermal conductivity, meeting critical application requirements of future high-power electronic device.		
1600-1630	Coffee break Exhibition hall																
1630-1830	ICCM Annual General Meeting																


THURSDAY 15 AUGUST

Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211		Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
0800-0805	Day 4 Welcome & Announcements															
0805-0850	PLENARY LECTURE: TRENDS IN AEROSPACE COMPOSITES <i>Jerry Young, Boeing, USA</i> Plenary 2															
0850-1030	Industry Forum on the Future of Composites <i>Wilhelm Rupertsberger, Fill, Austria</i> <i>Patrick Blanchard, Ford, USA</i> <i>Mike Hinton, High Volume Manufacturing Catapult Centre, UK</i> <i>David Doral, Quickstep, Australia</i> <i>Richard Simpson, Furnace Engineering, Australia</i> <i>Jennifer Conley, Advanced Fibre Cluster, Australia</i> <i>Sayata Ghose, Boeing, USA</i> Plenary 2															
0900-1030	NSF-AFOSR Joint Workshop on Mechanics-Based Design of Intelligent Material Systems by Multimaterial Additive Manufacturing PART 1 ADDITIVE MANUFACTURING OF THERMOSETTING POLYMERS AND COMPOSITES USING FRONTAL POLYMERIZATION <i>Nancy Sottos, UIUC</i> TUNABLE MECHANICS OF POROUS COMPOSITE FILMS VIA PHASE INVERSION AND 3D PRINTING – THEIR APPLICABILITY IN NEXT-GENERATION FLEXIBLE ELECTRONICS AND ENERGY STORAGE <i>Michael F. Durstock, US Air Force Research Lab</i> SELF-SENSING VARIABLE COMPLIANCE COMPOSITES <i>Robert Shepherd, Cornell University</i> UNVEILING BIO-MORPHOGENESIS THROUGH 4-D PRINTING <i>Ximin He, UCLA</i>															
1030-1100	Coffee break Exhibition hall															
1100-1320	4101 ONR Solid Mechanics Symposium	NSF-AFOSR Joint Workshop on Mechanics-Based Design of Intelligent Material Systems by Multimaterial Additive Manufacturing PART 2	4103 Nano-composites	4104 Liquid composites moulding and machining of composites	4105 Additive manufacturing	4106 Composite structures	4107 Multiscale modelling		4108 Three dimensional composites	4109 Fracture and damage	4110 Offshore and subsea	4111 Automotive	4112 Testing methods	4113 Hybrid composites	41145 Fatigue	4115 Mechanics of composites
1100-1130	KEYNOTE 1: DYNAMIC INSTABILITY OF ANISOTROPIC CYLINDERS IN CONFINING ENVIRONMENTS <i>Arun Shukla, University of Rhode Island</i> (Plenary 2) KEYNOTE 2: THERE IS NO SUCH THING AS A COMPOSITE MATERIAL – ONLY COMPOSITES OF MATERIALS <i>John Hart-Smith, Boeing</i> (retired) (Meeting room 211) KEYNOTE 3: INTEGRATING IMAGING TECHNIQUES FOR ASSESSING THE PERFORMANCE OF LARGE COMPOSITES STRUCTURES <i>Janice Barton, University of Southampton</i> (Meeting room 213) KEYNOTE 4: REVEALING THE MOLECULAR-SCALE ROLE OF CARBON FIBRE FUNCTIONALISATION IN POLYMER COMPOSITES <i>Tiffany Walsh, Deakin University</i> (Meeting room 219)															
1130-1140	Move to concurrent rooms															
1140-1200	4101-1 DEGRADATION OF THE EXPLOSIVE BLAST RESISTANCE OF COMPOSITES DUE TO SEAWATER ABSORPTION <i>Adrian Mouritz, RMIT University</i> Degradation of the Explosive Blast Resistance of Composites Due to Seawater Absorption	<i>This session starts at 1100 hours</i> MULTI JET FUSION TECHNOLOGY AND ITS ADVANCED VOX-EL POTENTIALS <i>Lihua Zhao, HP Labs</i> ADDITIVE MANUFACTURING AND ARCHITECTED MATERIALS: NEW METHODS AND MATERIALS <i>Christopher Spadaccini, Lawrence Livermore National Laboratory</i> ADDITIVELY MANUFACTURED SOLID/ LIQUID METAL COMPOSITE ACTUATORS: PROMISES AND CHALLENGES <i>Darren Hartl, Texas A&M University</i> DESIGN AND MANUFACTURING OF COMPLEX-GEOMETRY COMPOSITES COMBINING FUSED FILAMENT FABRICATION (FFF) AND AUTOMATED FIBER PLACEMENT (AFP) <i>Felix Raspall, Singapore University of Technology and Design</i> 3D PRINTING OF BIO-COMPATIBLE TOUGH SHAPE MEM-ORY HYDROGEL <i>Yuhang Hu, Georgia Institute of Technology</i> Sponsored by 	4103-1 BIOINSPIRED GRAPHENE/LIQUID CRYSTALLINE POLYMER NANOCOMPOSITE COATINGS FOR TRIBOLOGICAL APPLICATIONS <i>Xi Shen, Hong Kong University of Science and Technology</i> Novel graphene/ LCP composites with layered heterogenous structures show extremely high wear resistance and are therefore suitable for many tribological applications.	4104-1 CONSIDERATION OF THE DUAL SCALE OF PORE SIZE IN WICKING – VALIDATION ON CARBON REINFORCEMENTS AND APPLICATION TO THE SWELLING OF BIO-BASED REINFORCEMENTS <i>Hong-Nhan Vo, Ecole Des Mines</i> During the capillary wicking in Liquid Composite Moulding, a new model is proposed, taking into account the effect of fibre swelling at two scales: elementary fibres and yarns.	4105-1 LOW VELOCITY IMPACT OF ADDITIVE MANUFACTURING TI-6AL-4V SANDWICH PANELS WITH LATTICE <i>Peiyao Li, School of Aeronautics, Northwestern Polytechnical University, Xi'an, China</i> The main objective of this research is to study the low velocity impact response of sandwich panels with BCC and FCC lattice manufactured by SLM.	4106-1 THE PERFORMANCE OF THERMOPLASTIC AND THERMOSET COMPOSITES SUBJECTED TO LOW-VELOCITY AND HIGH-VELOCITY IMPACT LOADING <i>Jun Liu, Imperial College London</i> The performance of thermoplastic (ASA/ PEEK) and thermoset (T700/epoxy) laminates under drop-weight and gas gun impacts is evaluated. Three-dimensional Digital Image Correlation (DIC) and ultrasonic C-scan techniques are employed.	4107-1 SHORT FIBER COMPOSITES: COMPUTATIONAL HOMOGENIZATION VS ORIENTATION AVERAGING <i>Seyed Mohsen Mirkhalaf Valashani, University of Gothenburg/ chalmers University of Technology</i>		4108-1 SYNERGISTIC DELAMINATION TOUGHENING OF COMPOSITES USING NANO- AND MICRO-SCALE REINFORCEMENTS <i>Anil Ravindran, Deakin University</i>	4109-1 DIGITAL VOLUME CORRELATION FOR DAMAGE ANALYSIS IN CARBON FIBER COMPOSITES <i>Mahoor Mehdikhani, KU Leuven</i> Potential of digital volume correlation for investigation of damage in in-situ synchrotron images of carbon fiber composites is explored.	4110-1 LONG TERM FATIGUE DEGRADATION – SUPERPOSITION OF DRY AND WET PROPERTIES <i>Andreas Echtermeyer, Ntnu</i>	4111-1 A NEW CONCEPT FOR THE INTEGRATION OF AN INDUCTIVE CHARGING UNIT IN ELECTRIC VEHICLES USING FIBER REINFORCED PLASTIC <i>Tobias Mayr, Bmw Group</i> In this study a new concept for the integration of an inductive charging unit into the underbody of an electric vehicle by using fiber reinforced plastic is described.	4112-1 ASSESSMENT OF THE APPLICABILITY OF COMPOSITE MECHANICAL TEST STANDARDS FOR USE WITH 3D WOVEN COMPOSITES <i>Matthew Poole, National Physical Laboratory</i>	4113-1 CNT FIBER VEIL INTERLEAVED CARBON FIBER/ EXPOXY LAMINATE COMPOSITE <i>Yunfu Ou, Imdea Materials</i> Mode I interlaminar fracture toughness of woven fabric/ epoxy laminate was improved as much as 60% when interleaving as-received fluffy CNT veils, while degradation was observed in the unidirectional system.	4114-1 LONG-TERM SEA-WATER AGEING EFFECT ON FATIGUE CRACK GROWTH PROPERTIES OF CFRP <i>Antoine Le Guen-Geffroy, Ifremer</i>	4115-1 ON THE EXPERIMENTAL VALIDATION OF THE WAVE PROPAGATION MODELLING FOR TWO-DIMENSIONAL PERIODIC TEXTILE COMPOSITES <i>Victor Thierry, University of Nottingham</i> An experimental validation of a numerical method allowing vibroacoustic and ultrasonic wave propagation analysis in complex woven composites is proposed in this paper.
1200-1220	4101-2 EFFECT OF SEA WATER ON COMPRESSIVE PROPERTIES OF CARBON FIBER VINYL ESTER COMPOSITES <i>Dayakar Penumadu, University of Tennessee</i>	PROMISES AND CHALLENGES <i>Darren Hartl, Texas A&M University</i> DESIGN AND MANUFACTURING OF COMPLEX-GEOMETRY COMPOSITES COMBINING FUSED FILAMENT FABRICATION (FFF) AND AUTOMATED FIBER PLACEMENT (AFP) <i>Felix Raspall, Singapore University of Technology and Design</i> 3D PRINTING OF BIO-COMPATIBLE TOUGH SHAPE MEM-ORY HYDROGEL <i>Yuhang Hu, Georgia Institute of Technology</i>	4103-2 THE ENHANCED INTERLAMINAR FRICTIONAL BEHAVIOR OF WRINKLED GRAPHENE FOR DAMPING APPLICATION <i>Wenjiang Lu, Institute for Composites Science Innovation (inci), School of Materials Science and Engineering, Zhejiang University</i>	4104-2 NUMERICAL STUDY OF MULTI-DIMENSIONAL MULTI-TI-PHASE FLOW IN THE VACUUM ASSISTED RESIN INFUSION <i>Yubo Zhou, Beihang University</i>	4105-2 CARBON NANOTUBE/POLYCAPROLACTONE COMPOSITE FILAMENTS USED FOR 3D PRINTING <i>Liangliang Li, Tsinghua University</i> Carbon nanotube/ polycaprolactone composite filaments with various filler contents were synthesized. The composite filaments were electrically conductive and could be used for 3D printing.	4106-2 TENSILE STRENGTH PREDICTION OF NOTCHED LAMINATES FROM A COMPACT TENSION TEST <i>Qiang Ma, School of Aerospace Engineering & Applied Mechanics, Tongji University</i>	4107-2 NUMERICAL ANALYSIS OF DAMAGE PROPAGATION REGARDING WOVEN CFRP LAMINATES BASED ON HOMOGENIZATION THEORY <i>Kosuke Nonoyama, Department of Aerospace Engineering, Nagoya University</i> Damage propagation of woven CFRP laminates is simulated numerically based on the homogenization theory and the continuum damage mechanics with consideration of the elasto-viscoplasticity of epoxy resin.		4108-2 SUPPRESSING DELAMINATION IN COMPOSITE INTERSECTIONS WITH TUFTING AND Z-PINNING <i>Matt Scott, National Composites Centre</i>	4109-2 AXIAL COMPRESSIVE PROPERTIES OF RANDOMLY DISTRIBUTED DISCONTINUOUS LONG-CARBON FIBER REINFORCED THERMOPLASTIC MATRIX COMPOSITE <i>Kimiyoshi Naito, National Institute for Materials Science (NIMS)</i> A generic methodology for thermo-mechanical creep is developed, which provides a systematic and time-efficient approach for the material model calibration in an unequivocal manner.	4110-2 A GENERIC FRAMEWORK FOR THERMO-MECHANICAL CREEP OF THERMOPLASTIC MATERIALS <i>Sandeep Kumar, Namdeo, Airborne Oil & Gas</i> A generic methodology for thermo-mechanical creep is developed, which provides a systematic and time-efficient approach for the material model calibration in an unequivocal manner.	4111-2 FRAMEWORK FOR DURABILITY ANALYSIS OF COMPOSITE STRUCTURES IN THE AUTOMOTIVE INDUSTRY <i>Henrik Molker, Volvo Car Corporation</i> In this work, a framework for efficient analysis of composite structures is presented. The framework is implemented into commercial software ready for use and takes relevant failure modes into account.	4112-2 COMBINING DIGITAL IMAGE CORRELATION, PASSIVE THERMOGRAPHY AND ACOUSTIC EMISSION TO INVESTIGATE DAMAGE INITIATION AND PROPAGATION OF OUT-OF-PLANE FIBER WAVINESS <i>Michael Thor, University of Applied Sciences Upper Austria</i>	4113-2 OPTIMIZATION OF CARBON FIBRE REINFORCED POLYMER (CFRP) COMPOSITES WITH A THIN EMBEDDED POLYURETHANE FILM <i>Evanthia Pappa, The University of Edinburgh</i>	4114-2 EFFECTS OF SUBMICRON GLASS FIBER ADDITION ON MECHANICAL PROPERTY OF SHORT CARBON FIBER REINFORCED VINYL ESTER RESIN <i>Thi Thanh Nhan Nguyen, Doshisha University</i> The improvement of Mode I fracture toughness and fatigue life of resin and short carbon fiber composite reinforced vinyl ester matrix	4115-2 ENERGY ABSORPTION MECHANISMS IN LAYER-TO-LAYER 3D WOVEN COMPOSITES <i>Geoffrey Neale, Ulster University</i> This research investigates the suitability of a novel 3D woven composite architecture as an axial crush energy absorbing system for automotive applications.

THURSDAY 15 AUGUST																	
Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211			Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
1220-1240	4101-3 UNDERSTANDING EFFECT OF ARCTIC TEMPERATURE ON POST-IMPACT FLEXURAL STRENGTH OF COMPOSITES <i>K.T. Tan, The University of Akron</i> This work studies the flexural collapse modes of sandwich composites due to low arctic temperature and impact damage using analytical prediction and experimental validation.	4101-3 MULTI JET FUSION TECHNOLOGY AND ITS ADVANCED VOX-EL POTENTIALS <i>Lihua Zhao, HP Labs</i> ADDITIVE MANUFACTURING AND ARCHITECTED MATERIALS: NEW METHODS AND MATERIALS <i>Christopher Spadaccini, Lawrence Livermore National Laboratory</i> ADDITIVELY MANUFACTURED SOLID/ LIQUID METAL COMPOSITE ACTUATORS: PROMISES AND CHALLENGES <i>Darren Hartl, Texas A&M University</i>	4103-3 NANOENGINEERING OF FIBRE SURFACE FOR CARBON FIBRE-CARBON NANOTUBE HIERARCHICAL COMPOSITES <i>Wojciech Szmyt, Fachhochschule Nordwestschweiz, Institut Für Kunststofftechnik</i> An alumina coating of carbon fiber provides protection in the harsh conditions of direct carbon nanotube growth. We enhanced the alumina-fibre adhesion by surface treatment that promotes covalent bonding.	4104-3 WEAR BEHAVIOR OF SOME CUTTING TOOLS IN TURNING OF SILVER-IMPREGNATED GRAPHITE COMPOSITES <i>Chaoren Yan, Nanjing University of Aeronautics and Astronautics</i>	4105-3 A FACILE INK JETTING SYSTEM FOR ADDITIVE MANUFACTURING WITH ABRASIVE INK COMPOSITIONS TOWARDS 4D PRINTING <i>Hani Naguib, University of Toronto</i> 4D printing of functional materials using a novel binder jetting approach. The approach prints functionally graded composites, allowing pattern-driven 4D printing of activatable materials.	4106-3 ASSESSING DELAMINATION GROWTH UNDER VARIABLE AMPLITUDE LOADS <i>Loris Molent, Defence Science and Technology</i> Delamination growth in simple laminate specimens appears systematic and thus should be predictable.	4107-3 A DIRECT FE2 METHOD FOR CONCURRENT MULTILEVEL MODELING OF COMPOSITES IN A SINGLE FINITE ELEMENT ANALYSIS <i>Vincent Tan, National University of Singapore</i> Direct FE2 allows for the analysis of structures made from heterogeneous materials (e.g. composites) without the need for homogenized constitutive relations. It can be carried out directly on commercial FE software for non-linear finite deformation problems, including plasticity and damage.			4108-3 INFLUENCE OF TEXTILE ARCHITECTURE ON MECHANICAL PROPERTIES OF 3D WOVEN CARBON COMPOSITES <i>Monali Dahale, Ulster University</i>	4109-3 PREDICTING NON-LINEAR SHEAR DEFORMATION AND FAILURE IN 3D FIBRE-REINFORCED COMPOSITES <i>Carolyn Oddy, Chalmers University of Technology</i> The following work proposes a general framework for modelling the mechanical response of 3D fibre-reinforced composites.	4110-3 PREDICTING THE WETTED VIBRATION BEHAVIOR OF FLEXIBLE COMPOSITE HYDROFOILS <i>Andrew Phillips, Defence Science and Technology Group</i> The objective of this work is to develop a numerical modelling approach that can predict the wetted vibration behavior of flexible composite hydrofoils.	4111-3 STRENGTH AND FAILURE CHARACTERISTICS OF A RANDOM CARBON FIBER SMC-R COMPOSITE UNDER BIAXIAL STRESSES <i>Pankaj Mallick, University of Michigan-dearborn</i> Quasi-static biaxial stress experiments on a carbon fiber SMC-R show that the tensile stress at failure decreases with increasing shear stress and the failure envelope follows the Hill Equation closely.	4112-3 APPLICABILITY OF ISO 14125 FOR STEEL-COMPOSITE STRUCTURES <i>Houssin Wehbe, TU Braunschweig, Institut für Füge- und Schweißtechnik</i> The lack of standardised testing methods for hybrids motivates the investigation of the four-point bending test. Particular challenges are addressed, e.g. the asymmetric structure and the anisotropy of hybrid materials.	4113-3 HYBRID INTERFACE CARBON FIBER COMPOSITES – IMPROVED PERFORMANCE, REDUCED WEIGHT. <i>Filip Stojcevski, Deakin University</i> Nature inspired designs have been recreated in composite laminates using modifications to fiber interface bonding. Results show vast improvements to performance specifically when multiple interface types are employed simultaneously.	4114-3 FATIGUE CRACK PROPAGATION IN COMPOSITE LAMINATES BY A NOVEL APPROACH BASED ON THE S-N DIAGRAMS <i>Antonio Raimondo, Delft University of Technology</i>	4115-3 DISBOND GROWTH ASSESSMENT FOR BONDED PATCH REPAIR OF PRIMARY AIRFRAME STRUCTURES <i>Veldyanto Tanulia, University of New South Wales</i>
		1240-1300	4101-4 A COMBINED DIC-PIV EXPERIMENTAL APPROACH FOR THE STUDY OF IMPACT RESPONSE OF WATER-BACKED PANELS <i>Maurizio Porfirio, New York University Tandon School of Engineering</i> We demonstrate a combined approach to study fluid-structure interaction associated with water-backed impact, based on the integration of particle image velocimetry and digital image correlation.	4101-4 DESIGN AND MANUFACTURING OF COMPLEX-GEOMETRY COMPOSITES COMBINING FUSED FILAMENT FABRICATION (FFF) AND AUTOMATED FIBER PLACEMENT (AFP) <i>Felix Raspall, Singapore University of Technology and Design</i> 3D PRINTING OF BIO-COMPATIBLE TOUGH SHAPE MEMBRANES <i>Yuhang Hu, Georgia Institute of Technology</i> Sponsored by 		4104-4 THERMAL DAMAGE EVALUATION OF CFRP PROCESSED WITH NANOSECOND UV LASER PULSES <i>Hiroharu Tamaru, The University of Tokyo</i> The wavelength dependence of thermal damage for CFRP laser processing was evaluated by Raman spectroscopy, and it was observed that the resin is less damaged at a wavelength of 258nm.	4105-4 ADDITIVE MANUFACTURING OF BONE-INSPIRED STRUCTURAL-POWER COMPOSITES <i>Ajit Panesar, Imperial College London</i>	4106-4 INVESTIGATION OF THE INFLUENCE OF MECHANICAL PRE-DAMAGE AND STRAIN RATE ON THE MECHANICAL PROPERTIES OF CFRP/METAL HYBRID PROFILES <i>Markus Muth, Karlsruhe Institute of Technology</i> In the work at hand, a structure made out of steel and carbon fibre reinforced plastics (CFRP) is under investigation for its properties in quasi-static and dynamic properties.	4107-4 FORMULATION OF THE SIZE REDUCED UNIT CELL FOR TRIAXIALLY BRAIDED COMPOSITES <i>Mingming Xu, University of Nottingham</i> Relative displacement boundary conditions have been formulated for the size reduced unit cell of triaxially braided composites. From the implementation in UnitCells®, it has full prediction ability and cut the CPU time dramatically.		4108-4 NOVEL MANUFACTURING TECHNIQUES FOR OPTIMIZED 3D MULTIAXIAL ORTHOGONAL PREFORM <i>Vivek Koncherry, The University of Manchester</i> This study presents the robotic manufacturing process development and mechanical properties of optimised 3D multiaxial flat, cylindrical, near net and ultra-thick preform with orthogonal binders.	4109-4 IN-SITU OBSERVATION OF STRAIN FIELD IN ADHESIVELY BONDED CFRP JOINTS UNDER MODE I AND MODE II LOADING <i>Sota Oshima, Tokyo University of Agriculture and Technology</i> This paper quantitatively evaluates microscopic failure process in adhesively bonded CFRP joints by the digital image correlation method. The results were compared with that of numerical analyses.	4110-4 GRAPHENE/ POLYMER COMPOSITES FOR IMPROVED BARRIER PERFORMANCE <i>Thomas Raine, University of Manchester</i> We observe an order of magnitude reduction in carbon dioxide permeation and shutdown of hydrogen sulfide permeation through polyamide/graphene laminates. Epoxy/CF/graphene composites show a 60% reduction in carbon dioxide permeation.	4111-4 MULTI-PHYSICS SIMULATION OF SOFT MAGNETIC COMPOSITES FOR INDUCTIVE POWER TRANSFER SYSTEMS <i>Maedeh Amirpour, The University of Auckland</i>	4112-4 NOVEL MEASUREMENT SYSTEM FOR DETERMINING TEXTILE BEHAVIOR DURING OUT-OF-PLANE IMPREGNATION <i>Björn Willenbacher, Institut für Verbundwerkstoffe GmbH</i> An out-of-plane permeability measurement system is presented that initially enables monitoring of inhomogeneous hydrodynamic compaction of textiles during impregnation. From this data the non-linear distribution of fiber volume content along sample thickness can be derived.	4113-4 FAILURE MECHANISM OF TITANIUM-BASED CARBON-FIBRE/ EPOXY LAMINATES UNDER TENSION <i>Jing Sun, Guangzhou University</i> Tensile behaviour of titanium-based carbon-fibre/epoxy laminates (Ti-CF FMLs) were investigated. The failure mechanism as well as the specific energy absorption of the Ti-CF FMLs were analyzed and evaluated respectively.	4114-4 FATIGUE DAMAGE MECHANISMS OF CF-PPS FROM HIGH TO VERY HIGH CYCLES <i>Dominic Weibel, TU Kaiserslautern - Institute of Materials Science and Engineering</i> VHCF properties of aerospace applied CF-PPS are investigated using ultrasonic frequencies while 10 Hz HCF tests serve as benchmark. Similar damage mechanisms can be detected.
1300-1320	4101-5 IMPACT RESPONSE OF COMPOSITE SANDWICH STRUCTURES WITH TOUGHENED EPOXY MATRICES <i>George Irven, Imperial College London</i>	CONTINUED				4106-5 AN INVARIANT BASED TRANSVERSELY ISOTROPIC CONSTITUTIVE MODEL FOR UNIDIRECTIONAL POLYMER COMPOSITES CONSIDERING THE MATRIX VISCOUS EFFECTS <i>Fermin Otero, Inegi/cimne</i> A constitutive law at the ply level for unidirectional FRPs is presented. The model is capable to predict accurately the viscous effects and the non-linearities in the material response.	4107-5 INCREASING THE THERMAL CONDUCTIVITY OF POLYMER NANOCOMPOSITES FILLED WITH CARBON NANOTUBES VIA MOLECULAR DYNAMICS SIMULATION <i>Yangyang Gao, Beijing University of Chemical Technology</i>		4108-5 MESO-SCALE OPTIMISATION AND MANUFACTURING OF CONTINUOUS FIBRE 3D REINFORCEMENTS <i>Mikhail Matveev, The University of Nottingham</i>			4111-5 TUNABLE SELF-SENSING PERFORMANCE OF ADDITIVE MANUFACTURING ENABLED PLANAR NANOCOMPOSITES FOR BIOMEDICAL APPLICATIONS <i>Jabir Ubaid, Khalifa University</i> Permeability measurement is beginning to advance from the research stage toward industry application. As this transition is made, practical challenges in the transition from the research environment to meeting the needs of industry must be addressed.	4112-5 PRACTICAL APPLICATION OF TEXTILE PERMEABILITY MEASUREMENT <i>Ana Yong, National Physical Laboratory</i> Permeability measurement is beginning to advance from the research stage toward industry application. As this transition is made, practical challenges in the transition from the research environment to meeting the needs of industry must be addressed.		4114-5 RESEARCH ON THE STIFFNESS OF COMPOSITE PIPES UNDER STATIC FATIGUE AND CYCLIC FATIGUE <i>Yuging Zhen, Wuhan University of Technology</i> Basis on static fatigue test and cyclic fatigue test of different type and different deflection, the equation of variation of the ring stiffness is obtained.	4115-5 EFFECT OF THROUGH-THICKNESS PENETRATIVE REINFORCEMENTS ON THE MECHANICAL BEHAVIORS OF COMPOSITE-TO-METAL BONDED JOINTS <i>Longquan Liu, Shanghai Jiao Tong University</i> A through-thickness penetrative reinforcement technology of improving the damage tolerance and mechanical performance of the metal-composite joints was discussed.	
1320-1420	Lunch Exhibition hall																
1330-1415	Quality and future of journal publications <i>Michael Wisnom, Bristol Composites Institute (ACCIS)</i> <i>Tsu-Wei Chou, University of Delaware</i> <i>Ole Thomsen, University of Southampton</i>																
1400-1515	NSF-AFOSR Joint Workshop on Mechanics-Based Design of Intelligent Material Systems by Multimaterial Additive Manufacturing PART 3 DESIGNING WITH 4D PRINTING: EXPLORATIONS IN AUTONOMOUS MACHINES <i>Kristina Shea, ETH Zurich</i> TOPOLOGY OPTIMIZATION FOR ACTIVE AND MULTI-FUNCTIONAL COMPOSITES <i>Kurt Maute, University of Colorado Boulder</i> OPTIMIZATION-BASED DESIGN: A FORWARD-LOOKING PERSPECTIVE <i>Miguel Aguilo, Sanida National Laboratories</i> <i>Session continues at 1515</i>																
1420-1505	PLENARY LECTURE: DESIGN, MANUFACTURE AND PERFORMANCE OF TEXTILE COMPOSITES <i>Andrew Long, Nottingham University, UK</i> Plenary 2																
1505-1515	Move to concurrent sessions																

THURSDAY 15 AUGUST																		
Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211			Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219	
	1515-1550	P4201 Computational and finite element methods	NSF-AFOSR Joint Workshop on Mechanics-Based Design of Intelligent Material Systems by Multimaterial Additive Manufacturing PART 3	P4203 Self-healing and three dimensional composites	P4204 Process modelling	P4205 Recycling and sustainability and renewable energy	P4206 Fracture and damage	P4207 Joints			P4208 Nano-composites	P4209 Computational and finite element methods	P4210 Testing methods	P4211 Resin and polymers	P4212 Sandwich structures and materials	P4213 Interfaces and interphases	P4214 Fibers	P4215 Multiscale modelling
	1515-1520	P4201-1 POTENTIAL APPLICATION OF WIRE WOVEN MESH AS PACKING TOWER BED LIMITER- COMPUTATIONAL APPROACH <i>Vahid Ebrahiminejad, University of Southern Queensland</i> The potential application of Wire bulk cross (WBC) truss-like periodic cellular metal as future tower packing support evaluated. FEA and CFD results were combined for real case scenarios to optimise the best porosity ratios.	Session continued from 1400 FUNCTIONALIZING BISTABLE COMPOSITE LAMINATE STRUCTURES <i>Oliver Myers, Clemson University</i> EFFICIENT MULTISCALE OPTIMAL DESIGN AND FABRICATION OF CONTINUOUS FIBER REINFORCED COMPOSITES <i>Gowri Narasimha Boddeti, Singapore University of Technology and Design</i>	P4203-1 MICROCAPSULE-BASED SELF-HEALING PROTECTIVE COATING USING LINSEED OIL HEALING AGENT <i>Dong-min Kim, Yonsei University</i> In this study, it was to be developed for a microcapsule-type self-healing protective coating using linseed oil turning into a soft film as a healing agent for application to cementitious materials using linseed oil.	P4204-1 MODELING STRATEGY OF IR LAMPS WITH INTEGRATED REFLECTOR USED IN THE MANUFACTURING PROCESS OF THERMOPLASTIC COMPOSITE TAPES <i>Olivier De Almeida, Institut Clement Ader</i>	P4205-1 INFLUENCE OF NOVEL TYPES OF OLEFIN-MALEIC-ANHYDRIDE COPOLYMER BASED ADDITIVES IN BLENDS OF PA AND RECYCLED PET <i>Bianka Nagy, University of Pannonia</i> Effects of olefin-maleic-anhydride copolymer based additives have been investigated in PET/PA blends. Compatibilizer having lower molecular weight and same ratio of half-ester and unreacted anhydride groups was the most advantageous.	P4206-1 FRACTURE CHARACTERISTICS OF PARTICULATE REINFORCED COMPOSITES USING DIGITAL IMAGE CORRELATION <i>Sangdeok Kim, Chungnam National University</i> In this study, wedge splitting tests were performed to evaluate fracture behavior of particulate reinforced composite materials. Also, digital image correlation method was used to analyze the strain field.	P4207-1 NUMERICAL MODELING OF ADHESIVELY BONDED CFRP JOINTS CONSIDERING NON-LINEAR DEFORMATION OF ADHESIVE LAYERS <i>Shunta Mimura, Kyoto University</i> Numerical analyses were conducted to investigate the fracture behavior in the mode II fracture toughness test. Cohesive zone modeling (CZM) was used to evaluate the failure of adhesives and adherends.		P4208-1 USE OF RESOLE SEPIOLITE- PHOSPHATE NANOCOMPOSITE FOR BUILDING FACADES <i>Leila Soufeiani, University of Melbourne</i> Combustibility of cladding materials in the façade system is a serious problem. Therefore, investigation of new nanocomposite material to be replaced the existing combustible cladding's material is the purpose of this study.	P4209-1 MATERIAL DESIGN SIMULATION FOR FIBER REINFORCED CEMENT-BASED COMPOSITES USING MESO-SCALE ANALYSIS <i>Hiroki Ogura, Shimizu Corporation</i> This paper introduces a numerical simulation for optimizing the mixture of the fiber-reinforce cement-based composites. Short fibers are arranged individually in the specimen. The model capabilities are assessed through bending analyses.	P4210-1 EFFECTS OF GEOMETRY AND STACKING SEQUENCE ON APPARENT POISSON'S RATIO OF QUASI-ISOTROPIC LAMINATE CFRPS UNDER THE COMPRESSION TESTS <i>Eiichi Hara, Japan Aerospace Explolation Agency</i>	P4211-1 ANTIPLASTICSATION OF ARYL ETHER EPOXIES <i>Larry Reyes, Carbon Nexus, Institute for Frontier Materials, Deakin University</i> The simultaneous improvement of modulus, strength and strain-to-failure was achieved for multi-aryl epoxies by varying the substitution patterns within their backbone without significant decrease in Tg.	P4212-1 FRACTURE BEHAVIOR AND FACE SHEET BUCKLING ANALYSIS OF CFRP/HONEYCOMB SANDWICH PANELS SUBJECTED TO BENDING LOAD <i>Mae Oiwa, Tokyo University of Agriculture and Technology</i> This study clarified the local buckling behavior of the face sheet of a CFRP/Nomex honeycomb sandwich panel subjected to four-point bending load using finite element method.	P4213-1 TUNABLE MICROWAVE DIELECTRIC RESPONSE IN CARBON NANOCOMPOSITES VIA VERTICAL INTERPHASE <i>Faxiang Qin, Zhejiang University</i> This research system-atically investigates the wet-spinning of the blends of textile and carbon fibre grade PAN polymers. The stability of the different dope solutions and their spinnability was checked by rheological measurements.	P4214-1 LOW-COST, HIGH STRENGTH POLYACRYLONITRILE PRECURSOR FIBRE <i>Huma Khan, Deakin University, Waurn Ponds, Australia</i> Homogenised mechanical properties are extracted from sheared textile composite unit cell models for use in macro-scale component analysis. Macro-scale mechanical models are then run with the deformation from the forming stage included, for performance predictions.	P4215-1 ACCOUNTING FOR SHEARED TEXTILE COMPOSITE UNIT CELL PROPERTIES IN MACRO SCALE FE SIMULATIONS <i>Meng-yi Song, ACCIS - University of Bristol</i>	
	1520-1525	P4201-2 FINITE ELEMENT ANALYSIS AND EXPERIMENTAL TESTING OF NON-CRIMP FABRIC COMPACT TENSION SPECIMENS - INFLUENCE OF COHESIVE PROPERTIES. <i>Dimitris Gouskos, Imperial College London</i>	Sponsored by 	P4203-2 SELF-HEALING PROPERTIES OF CARBON-BLACK IMPREGNATED THERMOPLASTIC POLYURETHANE PROCESSED VIA FUSED DEPOSITION MODELLING <i>Fareed Tamaddoni Jahromi, Swinburne University of Technology</i> The objective of our work is to investigate the fibre matrix separation during compression moulding and for that, 1D squeeze flow experiments are performed in a flat geometry.	P4204-2 1D SQUEEZE FLOW ANALYSIS OF CHOPPED LONG FIBER THERMOPLASTIC COMPOSITE <i>Waqas Ali, University of Twente</i> The objective of our work is to investigate the fibre matrix separation during compression moulding and for that, 1D squeeze flow experiments are performed in a flat geometry.	P4205-2 DEVELOPMENT OF HIGH PERFORMANCE ALIGNED DISCONTINUOUS FIBRE COMPOSITES: FIBRE SURFACE MODIFICATION <i>Thomas Pozegic, University of Bristol</i> The High Performance Discontinuous Fibre technology is an effective and sustainable high performance Aligned Discontinuous Fibre Reforced Composite (ADFRC) manufacturing process, with the potential for high production throughput. In this presentation, fibre surfaces are modified to increase throughput.	P4206-2 DAMAGE PROGRESSION OF NOTCHED AND UNNOTCHED COMPOSITE LAMINATES UNDER PICTURE-FRAME SHEAR LOADING <i>Daniel Rapping</i> The Rx-FEM formulation was preliminarily applied to two distinct material systems for a picture frame shear testing configuration. Both material systems had notched and un-notched configurations.	P4207-2 THE EFFECTS OF ENVIRONMENTAL CONDITIONS ON THE STRENGTH OF DOUBLE LAP JOINTS <i>Aakash Paul, University of Bristol</i> Tests were conducted at Room Temperature Dry, Hot Temperature Dry and Hot Temperature Wet conditions. The changing failure modes were identified, and material characterisation tests were conducted to understand the joint performance.		P4208-2 NUMERICAL INVESTIGATION ON MECHANICAL PROPERTIES OF POLYMER COMPOSITES REINFORCED WITH MXENE NANOSHEETS <i>Daiva Zeleniakiene, Kaunas University of Technology</i> This study is addressed to identify a suitable methodology based on finite element homogenization approach for prediction of mechanical properties of polymer composite reinforced with MXene 2D nanoparticles.	P4209-2 DYNAMIC STRESS-STRAIN RELATION OF ALUMINUM POWDERS USING MULTI-PARTICLE FINITE ELEMENT METHOD <i>Kefeng Peng, University of Science and Technology of China</i> Based on the multi-particle finite element methods,the dynamic stress-strain relationship of granular metal materials was determined.	P4210-2 AXIAL COMPRESSION TESTING OF CARBON FIBERS <i>Shipeng Zhu, Aerospace Research Institute of Materials and Processing Technology,</i> In this study, the axial compression strength of carbon fiber multifilament has been determined on a series PAN-based carbon fibers using bundle compression test similar to the compression measurement of unidirectional laminated composites. This test allows for rapid response and utilizes smaller amounts of material for initial screening testing.	P4211-2 THE PREPARATION, PROCESSING AND HEALING OF DIELS-ALDER EPOXIES AND THEIR FIBRE-REINFORCED POLYMER COMPOSITES <i>Callum Branfoot, University of Bristol</i> Epon 828 (DGEBA) was modified into covalent adaptable networks (CANs) using Diels-Alder chemistry. These CANs were there then thermomechanically characterised and tested as matrices for functional FRP composites.	P4212-2 DESIGN EXPLORATION OF MULTI-LAYER SANDWICH STRUCTURES TO TRANSVERSE LOADING <i>Anbazhagan Subramani, Singapore University of Technology and Design</i>	P4213-2 TAILORING INTERFACIAL INTERACTIONS IN FIBER REINFORCED POLYMERIC COMPOSITES BY THE ELECTROSPRAY DEPOSITION OF WATERBORNE CARBON NANOTUBES <i>Murat Tansan, Sabanci University</i> This study aims to enhance the mechanical performance of fiber reinforced polymeric composites by electrospray deposition of waterborne single-walled carbon nanotube dispersion onto dry woven carbon fabric.	P4214-2 TRANSVERSE YOUNG'S MODULUS MEASUREMENT OF CARBON FIBRE BY ATOMIC FORCE MICROSCOPE AND NANOINDENTATION <i>Shanghong Duan, Chalmers University of Technology, Sweden</i>	P4215-2 FINITE STRAIN PARAMETRIC HFGMC PREDICTION OF THE MICROMECHANICAL BEHAVIOR OF COMPOSITE <i>Uri Breiman, Tel-aviv University</i> Extension of the parametric HFGMC to incorporate the finite-strain micromechanics of composites is presented. Macroscale and microscale response of UD's is successfully compared with the orthogonal HFGMC and the FEA.	
	1525-1530	P4201-3 MICROMECHANICS MODELING OF TENSILE/SHEAR BEHAVIOR AND CRACK DENSITY OF COMPOSITE MATERIALS <i>Daichi Haruyama, Ihi Corporation</i> We considered the method to evaluate the relationship between matrix crack and transverse crack and stiffness degradation of brittle matrix composites.		P4203-3 STUDY ON CFRP PI-BEAM PARAMETRIC AND STRENGTH ANALYSIS <i>Geon Tae Park, Changwon National University</i> In this study, we apply the 2D carbon fiber for the beam structure, optimize the parameters of the beam through the experimental evaluation and analysis, and then try to find the optimum strength of the beam by manufacturing the 3D beam.	P4204-3 MACHINE-DRIVEN EXPERIMENTATION FOR SOLVING CHALLENGING CONSOLIDATION PROBLEMS <i>Anatoly Koptelov, Advanced Composites Collaboration for Innovation and Science (ACCIS), University of Bristol</i> A new consolidation sensor framework for the characterisation of resin flow in composite precursors was developed. Unlike existing characterisation approaches, the proposed consolidation sensor is not limited by the material type and predefined loading schedule for the test.	P4205-3 UPCYCLING OF AEROSPACE CARBON SCRAP: IMPACT OF MATERIAL PROPERTIES <i>Sanjeev Rao, Khalifa University</i>	P4206-3 DEVELOPMENT OF PROGRESSIVE FAILURE ANALYSIS METHOD FOR COMPOSITE LAMINATES CONTAINING OPENINGS WITH DIGITAL IMAGE CORRELATION <i>Danghyun Yoon, Chungnam National University</i> A progressive failure analysis model was developed using crack-band-model according to existing researches. and it was evaluated comparing with experimental results including strain contour obtained from DIC. The numerical results demonstrated a good correlation with the experimental results.	P4207-3 A STUDY ON THE CHANGE OF ADHESIVE SHEAR STRENGTH OF CARBON STEEL/ CARBON FIBER REINFORCED PLASTIC COMPOSITE BY SURFACE TREATMENT OF CARBON STEEL <i>Seung Hak Song, Korea University</i> In this study, the changes of the adhesive shear strength according to the surface roughness change and oxide film presence were measured and the cause of the fracture was analyzed through the fractured surface observation.		P4208-3 POLYIMIDE AEROGELS CROSS-LINKED WITH AMINATED AG NANOWIRES: MECHANICALLY STRONG AND TOUGH <i>Tianyi Zhang, Beihang University</i>	P4209-3 DESIGN OF 70MPA COMPOSITE HYDROGEN STORAGE VESSEL <i>Cheng Shuo, Hefei University of Technology</i> Accurate modeling of IV type hydrogen storage vessel and optimize the structure design by 3D scanner,based on the progressive damage theory predict burst pressure cylinders	P4210-3 SINGLE FIBER PULL-OUT TEST FOR THE MATERIAL SELECTION OF A HYBRID RESIN COMPOSITE <i>Holger Buettemeyer, Faserinstitut Bremen e.V.</i> This study deals with fibre pull-out test. It gives general recommendations for embedding the fibres into the liquid resin.	P4211-3 THE ONE-POT SYNTHESIS, CHARACTERIZATION AND POLYMERIZATION OF HYPERBRANCHED BENZOXAZINE RESINS DERIVED FROM A2 + B3 MONOMERS <i>Wanan Cai, Harbin Engineering University</i>	P4212-3 DECONSOLIDATION BEHAVIOR OF CARBON FIBER REINFORCED THERMOPLASTICS AS CORE IN SANDWICH STRUCTURE <i>Bing Xiao, The University of Tokyo</i>	P4213-3 MOLECULAR SIMULATIONS OF INTERPHASE FORMATION PROCESS OF CARBON FIBER REINFORCED POLYMER COMPOSITES <i>Yingdan Zhu, Ningbo Institute of Material technology and Engineering (NIMTE), Chinese Academy of Science</i> The reaction mechanism of cross-linking process and interphase model of carbon fiber reinforced epoxy composites was developed and analyzed by molecular dynamics simulation.	P4214-3 SPECIMEN PREPARATION FOR TRANSVERSE MODULUS MEASUREMENT OF CARBON FIBRES USING FOCUSED ION BEAM <i>Fang Liu, Chalmers University of Technology</i>	P4215-3 DEVELOPMENT OF MULTISCALE DAMAGE PROPAGATION ANALYSIS METHOD FOR WOVEN LAMINATES USING A HOMOGENIZATION THEORY <i>Gai Kubo, University of Tsukuba</i> In this study, we develop an efficient multiscale analysis method for damage propagation of woven laminates using a homogenization theory.	

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Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211			Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219	
1530-1535	<p>P4201-4 APPLICATION OF A VARIABLE-KINEMATICS CONTINUUM SHELL ELEMENT TO THE ADAPTIVE NONLINEAR ANALYSIS OF COMPLEX SHELL STRUCTURES <i>Aewis K.W. Hji, Bristol Composites Institute (accis)</i></p> <p>A variable-kinematics continuum shell element, whose through-thickness kinematics are adaptively refined/ reduced 'on-the-fly' is developed. The model is applied to the fracture analysis of composites, with adaptive element splitting using higher-order cohesive zone model.</p>	<p>NSF-AFOSR Joint Workshop on Mechanics-Based Design of Intelligent Material Systems by Multimaterial Additive Manufacturing PART 3 <i>Session continued from 1400</i></p> <p>Sponsored by</p> 	<p>P4203-4 THE OPTIMIZATION OF PROCESS PARAMETERS OF THREE-DIMENSIONAL NEEDED COMPOSITES BASED ON ANN AND GA <i>Yunchao Qi, Harbin Institute of Technology</i></p> <p>A surrogate model for optimizing process parameters of three dimensional needed preforms of C/C-SiC composites was established based on back propagation (BP) neural network combing with improved genetic algorithm.</p>	<p>P4204-4 MODELING THE TEMPERATURE GRADIENT EFFECT ON THE CURE-INDUCED DISTORTION OF CFRP L-SHAPED LAMINATES <i>Yujun Li, Northwestern Polytechnical University</i></p>	<p>P4205-4 NOVELTY IN RECYCLING OF WASTE ELASTOMERS IN HDPE/PP BLENDS BY EXPERIMENTAL COMPATIBILIZERS <i>Lilla Simon-Stöger, University of Pannonia, Faculty of Engineering, Institutional Department of MOL Hydrocarbon and Coal Processing</i></p> <p>Rubbery waste has been jointly recycled as filler of HDPE/PP matrix by incorporation of experimental compatibilizers for achieving property specific end-product through selecting additive structure with suitable molecular weight copolymer.</p>	<p>P4206-4 MICRO-CRACK STUDY OF MULTICRYSTALLINE SILICON SOLAR PANEL BASED ON IN-SITU EXPERIMENT <i>Yangbo Zhang, Xi'an Jiaotong University, Xi'an, China</i></p> <p>In this paper,an effective experimental in-situ tensile experiment method with a backboard is explored to study the micro-crack behavior of the polycrystalline silicon photovoltaic wafers, including the micro-crack initiation and propagation.</p>	<p>P4207-4 DAMAGE IN HYBRID JOINTED GLARE STRUCTURES UNDER THE QUASI-STATIC <i>Peifei Xu, Harbin Institue of Technology</i></p>		<p>P4208-4 INTERFACIAL PROPERTIES OF MXENE/GRAPHENE/ POLYMER MATRIX NANOCOMPOSITES <i>Kristina Žukiene, Kaunas University of Technology</i></p> <p>The aim of this study is to determine the interfacial adhesion and compatibility at MXene-polymer matrix interface and the overall MXene/graphene/polymer nanocomposite performance.</p>	<p>P4209-4 A MICROMECHANICAL MODEL IN CYCLIC PLASTICITY FOR FIBER REINFORCED WAVY COMPOSITES <i>Danhui Yang, Xi'an Jiaotong University</i></p> <p>A micromechanical model based on the parametric finite-volume direct averaging micromechanics theory and the Abdel-Karim-Ohno cyclic constitutive model was build to simulate the cyclic behavior of periodic composites with wavy microstructure.</p>	<p>P4210-4 RESIN TREATMENT FOR RELIABLE TRANSVERSE SHEAR STRENGTH ASSESSMENT IN AEROSPACE STRUCTURES <i>Tomas Chuaqui, University of Bath</i></p> <p>A resin treatment is applied on short beam coupons to produce far less conservative predictions of the transverse shear strength of large aerospace components, by suppressing free edge effects.</p>	<p>P4211-4 NEW THERMOSET MATRIX BASED ON BISOXAZOLINES <i>Salumeh Issazadeh, Deakin University</i></p> <p>Bisoxazoline resins are emerging due to high glass transition temperatures and improved inherent fire performance compared with traditional epoxy resins. In this study, the thermal properties and the effect of the bisoxzoline in the CALIDUR™ composite structure is investigated.</p>	<p>P4212-4 MECHANICAL PROPERTIES AND ENERGY ABSORPTION CAPABILITY OF HYBRID HONEYCOMB SUPERSTRUCTURE <i>Mengchuan Xu, Beijing Institute of Technology</i></p> <p>This paper introduces the design concept of the hierarchical structures in the AuxHex structures. Hybrid honeycomb superstructures with sub-structures of triangles and arrows were proposed.</p>	<p>P4213-4 CHARACTERISATION OF BOND STRENGTH IN OVERMOULDED HIGH-PERFORMANCE THERMOPLASTIC COMPOSITES <i>Robert Galtzsch, Faser-institut Bremen e.V.</i></p> <p>The bond strength of overmoulded PAEK-carbon fibre composites is experimentally characterised using a rib-pull-off test. Manufacturing parameters are varied and the effects on bond strength are discussed.</p>	<p>P4214-4 FACTORS GOVERNING THE TENSILE STRENGTH OF BASALT FIBRE <i>Dan Xing, The Xinjiang Technical Institute of Physics and Chemistry, Chinese Academy of Sciences</i></p> <p>The strength of seven commercial basalt fibres was studied and compared, and the factors affecting the tensile strength of these fibres were investigated.</p>	<p>P4215-4 ANALYSIS OF MICRO/MESO/MACRO TEMPERATURE-DEPENDENT ELASTOVISCOPLASTIC PROPERTIES OF WOVEN COMPOSITES <i>Junpei Tetsuka, Tsukuba University</i></p> <p>Elastoviscoplastic analysis of plain-woven glass fiber reinforced plastic (GFRP) composites in consideration of temperature-dependence of matrix materials is carried out based on the triple-scale homogeni-zation method.</p>		
			1535-1540	<p>P4201-5 MECHANICAL BEHAVIOR OF TEXTILE COMPOSITES USING A TWO-STEP HOMOGENIZATION TECHNIQUE <i>Chaeyoung Hong, Unist</i></p> <p>The two-step homogenization method at the fiber/ matrix level and the textile level is presented. It is demonstrated this approach is capable of efficiently predicting the effective properties of textile composites.</p>		<p>P4203-5 EFFECT OF VASCULAR TUBES DESIGN ON MECHANICAL AND SELF-HEALING PROPERTIES OF CFRP COMPOSITES <i>Song Jungil, Changwon National University</i></p> <p>The influence of resin fraction on the interlaminar properties of continuous glass fiber reinforced poly(phenylene sulfide) (PPS) modified with multi-walled carbon nanotubes (MWNTs) and silicon carbide whiskers were studied.</p>	<p>P4204-5 A CHARACTERIZATION STUDY RELATING CROSS-SECTIONAL DISTRIBUTION OF FIBRE VOLUME FRACTION AND PERMEABILITY <i>Filip Salling Rasmussen, Technical University of Denmark</i></p> <p>This study discusses the effect of CFRP used for the brimmed-diffuser shroud on the vortex-induced vibration using a coupling analysis of 3D modal analysis and 2D aeroelastic analysis.</p>	<p>P4205-5 EFFECT OF CFRP ON VORTEX-INDUCED VIBRATION OF A BRIMMED-DIFFUSER SHROUD FOR A WIND TURBINE <i>Taeyoung Kim, Kyushu University</i></p> <p>This study discusses the effect of CFRP used for the brimmed-diffuser shroud on the vortex-induced vibration using a coupling analysis of 3D modal analysis and 2D aeroelastic analysis.</p>	<p>P4206-5 INTERLAMINAR PROPERTIES OF CONTINUOUS FIBER REINFORCED THERMOPLASTIC COMPOSITES WITH DIFFERENT RESIN FRACTION <i>Tao Zhang, Beihang University</i></p> <p>The influence of resin fraction on the interlaminar properties of continuous glass fiber reinforced poly(phenylene sulfide) (PPS) modified with multi-walled carbon nanotubes (MWNTs) and silicon carbide whiskers were studied.</p>	<p>P4207-5 MECHANICAL PROPERTIES OF CFRP SINGLE LAP ADHESIVE JOINT <i>Kotono Yanagisawa, Tokyo Metropolitan University</i></p> <p>The strength of metal-CFRP adhesive joint was evaluated quantitatively. The relationship between strength and failure mode of the joints was also characterized.</p>		<p>P4208-5 ENHANCED FATIGUE PROPERTIES OF GRAPHENE OXIDE/ CARBON BLACK/ NATURE RUBBER COMPOSITES <i>Shipeng Wen, Beijing University of Chemical Technology</i></p> <p>The strength of metal-CFRP adhesive joint was evaluated quantitatively. The relationship between strength and failure mode of the joints was also characterized.</p>	<p>P4209-5 MULTISCALE FAILURE ANALYSIS OF 3D BRAIDED COMPOSITE STRUCTURE BY COUPLING FEM AND FFT METHOD <i>Guodong Fang, Harbin Institute of Technology</i></p> <p>Considering large deformation behaviors of circular ring subjected to compressive force, an innovative method is developed to measure Young's modulus of each layer in a flexible multi-layered materials (wire,thin plate).</p>	<p>P4210-5 AN INNOVATIVE CIRCULAR RING METHOD FOR MEASURING YOUNG'S MODULUS OF THIN FLEXIBLE MULTI-LAYERED MATERIALS (COMPRESSIVE METHOD) <i>Atsumi Ohtsuki, Meijo University</i></p> <p>Considering large deformation behaviors of circular ring subjected to compressive force, an innovative method is developed to measure Young's modulus of each layer in a flexible multi-layered materials (wire,thin plate).</p>	<p>P4211-5 MELAMINE-MELTBLOWN NONWOVEN A HIGH-PERFORMANCE MATERIAL COMBINING FOR THE FIRST TIME THERMOSET MELAMINE WITH EXCELLENT THERMAL AND ACOUSTIC PROPERTIES. <i>Simona Lavric, Melamin D.d. Kocevje</i></p> <p>The employment of SuFEx 'click' chemistries were explored on carbon fibres for the first time. Remarkably, a 130% improvement to the IFSS in epoxy resin was obtained, with no degradation to fibre tensile properties.</p>	<p>P4212-5 NUMERICAL SIMULATION OF IMPACT PERFORMANCE FOR PMI FOAM FILLED CORRUGATED BOARD SANDWICH STRUCTURE <i>Peiyan Yang, Harbin Engineering University</i></p> <p>The high temperature exposure for KD-II continuous silicon carbide fibers was carried out at 800°C, 1000°C, 1200°C, 1400°C and 1500°C for 1 h in air and argon atmosphere to investigate the properties and structures evolution of the fibers using tensile tests, XRD and SEM analysis</p>	<p>P4213-5 MODIFICATION OF CARBON FIBRE SURFACES BY SUFEX CLICK CHEMISTRY <i>James Randall, Institute for Frontier Materials</i></p> <p>The employment of SuFEx 'click' chemistries were explored on carbon fibres for the first time. Remarkably, a 130% improvement to the IFSS in epoxy resin was obtained, with no degradation to fibre tensile properties.</p>	<p>P4214-5 PROPERTIES AND STRUCTURAL PERFORMANCE OF KD-II SIC FIBER WITH DIFFERENT TEMPERATURE IN AIR AND ARGON ATMOSPHERE <i>Chenxi Yang, Beihang University</i></p> <p>The high temperature exposure for KD-II continuous silicon carbide fibers was carried out at 800°C, 1000°C, 1200°C, 1400°C and 1500°C for 1 h in air and argon atmosphere to investigate the properties and structures evolution of the fibers using tensile tests, XRD and SEM analysis</p>
1540-1545	<p>P4201-6 WATER VAPOR CORROSION BEHAVIOR AND FAILURE MECHANISM OF PLASMA SPRAYED MULLITE/LU2SI2O7-LU2SIO5 COATINGS <i>Xunxun Hu, School of Materials Science and Engineering, Beihang University, Beijing, China</i></p> <p>Plasma sprayed mullite/Lu2Si2O7-Lu2SiO5 coatings were fabricated. Water vapor corrosion behavior and failure mechanism were investigated.</p>			<p>P4204-6 NUMERICAL SIMULATION OF FLOW OF RUBBER COMPOUNDS IN PARTIALLY FILLED INTERNAL MIXER <i>Haibo Yang, Beijing University of Chemical Technology(buct)</i></p> <p>This work addresses challenges in automatic single fibre characterization. It answers the question: if textile processes such as spreading or NCF manufacturing affects the strength (and Weibull parameters) of fibers during processing and to what extent?</p>	<p>P4205-6 REAL-TIME SINGLE MOLECULAR STUDY OF A PRETREATED CELLULOSE HYDROLYSIS MODE AND INDIVIDUAL ENZYME MOVEMENT <i>Yanan Zhang, Nanjing University of Technology</i></p> <p>This work addresses challenges in automatic single fibre characterization. It answers the question: if textile processes such as spreading or NCF manufacturing affects the strength (and Weibull parameters) of fibers during processing and to what extent?</p>				<p>P4209-6 INDENTATION RESPONSE OF TOPOLOGICAL LATTICE <i>Xiao-fei Guo, Harbin Institute of Technology</i></p> <p>We propose a novel periodic topological mechanical metamaterial, topological lattice, whose opposite surfaces have significantly different indentation hardness.</p>	<p>P4210-6 CHARACTERIZATION AND STATISTICAL ANALYSIS OF SINGLE FIBER STRENGTH OF FIBERS AT VARIOUS PROCESSING STAGES <i>Ashok Rajpurahit, Chomarat Textiles Industries</i></p> <p>This work addresses challenges in automatic single fibre characterization. It answers the question: if textile processes such as spreading or NCF manufacturing affects the strength (and Weibull parameters) of fibers during processing and to what extent?</p>	<p>P4211-6 LIQUID PROCESSABLE, THERMALLY STABLE, HYDROPHOBIC PHENOLIC-TRIAZINE RESINS FOR ADVANCED COMPOSITE APPLICATIONS <i>Aristeidis Tsiamis, University of Bristol (ACCIS)</i></p> <p>The aim of the project is to combine a commercial phenolic-triazine (PT) oligomer with a liquid cyanate ester monomer to produce liquid processable, thermally stable, hydrophobic PT resins for advanced composite applications.</p>	<p>P4212-6 THE ANALYTICAL AND NUMERICAL CHARACTERIZATION REGARDING INDENTATION OF COMPOSITE HONEYCOMB SANDWICH STRUCTURES <i>Xiaoyu Zhang, Northwestern Polytechnical University</i></p> <p>This paper focuses the analytical and numerical method on indentation of sandwich structure considering shear effect and nonlinear collapse of core material.</p>	<p>P4213-6 DIRECTIONAL LAMINATES USING CARBON NANOTUBE INTERFACES <i>Lulu Shen, Tongji University</i></p> <p>Self-sensing capability of carbon nanotube network played as in situ sensor on delamination in glass fiber reinforced composite laminates was investigated.</p>	<p>P4214-6 OIL-WATER SEPARATION USING JANUS MEMBRANES <i>Avinash Bajji, La Trobe University</i></p> <p>The high temperature exposure for KD-II continuous silicon carbide fibers was carried out at 800°C, 1000°C, 1200°C, 1400°C and 1500°C for 1 h in air and argon atmosphere to investigate the properties and structures evolution of the fibers using tensile tests, XRD and SEM analysis</p>	<p>P4215-6 IDENTIFICATION OF THE QUASI-STATIC BEHAVIOR OF A WOVEN COMPOSITE SENSITIVE TO THE ENVIRONMENTAL CONDITIONS USING NUMERICAL HO-MOGENIZATION <i>Patrick Rozczyk, Institut de Recherche en Génie Civil et Mécanique - Ecole Centrale de Nantes</i></p> <p>A double scale numerical homogeneization is used to obtain the stress-strain curve for a thermoplastic composite which is influenced by the temperature and the relative humidity instead of doing exper-iments.</p>			
1545-1550												<p>P4210-7 A NOVEL TEST METHOD TO INDUCE BI-AXIAL STRESS STATES IN THIN PLY CARBON COMPOSITES UNDER COMBINED LONGITUDINAL COMPRESSION AND TRANSVERSE TENSION <i>Tamas Rev, University of Bristol</i></p> <p>The objective of this study to develop an innovative test method using thin ply carbon/ epoxy composites that allows for a more accurate determination of compressive strength for such materials.</p>	<p>P4211-7 POLYANILINE/ PHENOL-DIVINYLBENZENE RESIN FOR CFRP COMPOSITE WITH ENHANCED ELECTRICAL AND MECHANICAL PROPERTIES <i>Yu Zhou, The University of Tokyo</i></p> <p>The present study focuses on phenolic-modified Polyaniline/ Divinylbenzene resin with enhanced electrical conductivity and mechanical property, which gives this resin system a promising future in carbon fiber reinforced plastic application.</p>	<p>P4212-7 MANUFACTURING AND COMPARISON OF SPRINGBACKED CARBON FIBER REINFORCED THERMOPLASTIC SANDWICH STRUCTURES <i>Yunqian Zhang, The University of Tokyo</i></p> <p>This study focused on the novel manufacturing progress of CFRTP sandwich structures and improved energy absorption ability of the sandwich structures to a great extent with low density.</p>	<p>P4213-7 MUSSEL INSPIRED SURFACE MOD-IFICATION AND FUNCTIONALIZA-TION METHOD WITH HIGHLY EFFICIENT AND ENVIRONMEN-TAL FRIENDLY <i>Wencai Wang, Beijing University of Chemical Technology</i></p> <p>The present study focuses on the novel manufacturing progress of CFRTP sandwich structures and improved energy absorption ability of the sandwich structures to a great extent with low density.</p>			

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Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211			Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
1550-1620	Coffee break Exhibition hall																
1620-1820	4301 ONR Solid Mechanics Symposium	NSF-AFOSR Joint Workshop on Mechanics-Based Design of Intelligent Material Systems by Multimaterial Additive Manufacturing PART 4	4303 Nano-composites	4304 Process modelling and machining of composites	4305 Additive manufacturing	4306 Composite structures	4307 Sandwich structures and materials			4308 Fibers	4309 Fracture and damage	4310 Damage intolerance and ceramic matrix composites	4312 Civil engineering and ceramic matrix composites	4312 Hybrid composites	4313 Smart composite structures	4314 Joints	4315 Aerospace
1620-1640	4301-1 FRACTURE MECHANICS SOLUTIONS FOR INTERFACE CRACKS IN BI-MATERIAL AND SANDWICH BEAMS <i>Roberta Massabo, University of Genova</i>	NSF-AFOSR Joint Workshop on Mechanics-Based Design of Intelligent Material Systems by Multimaterial Additive Manufacturing PANEL DISCUSSION Sponsored by 	4303-1 GRAPHENE BASED NANOCOMPOSITES FOR TRIBOLOGICAL APPLICATION <i>Han Wang, Institute of Metal Research, Chinese Academy of Science</i>	4304-1 SIMULATING COMPRESSION-INDUCED RESIN TRANSFER FROM A SATURATED NON-WOVEN INTO A DRY FIBER STRUCTURE <i>Tom Allen, Auckland University</i>	4305-1 FIFDM – ADVANCED 3D PRINTING WITH CONTINUOUS FIBER REINFORCEMENT <i>Jens Schlimbach, Institut Für Verbundwerkstoffe GmbH</i>	4306-1 LOAD ANALYSIS OF SMALL WIND TURBINE BLADES WITH FIBER-METAL LAMINATE SKIN <i>Wei Sai, Nanyang Technological University</i>	4307-1 SIMULATING RESIN INFUSION FOR MANUFACTURING SANDWICH-STRUCTURED COMPOSITES <i>Yi-Kai Kao, National Tsing Hua University</i>			4308-1 NANO-MAGNETITE DECORATED CARBON FIBRE FOR ENHANCED INTERFACIAL SHEAR STRENGTH <i>Sobhan Fakhrhoseini, Carbon Nexus/deakin University</i>	4309-1 EFFECT OF THROUGH-THICKNESS COMPRESSIVE STRESS AND POROSITY ON THE TENSILE STRENGTH OF CARBON-FIBRE REINFORCED COMPOSITES <i>Jan Rojek, MINES Paristech - PSL Research University</i> A custom testing setup is designed and the influence of porosity is investigated on the tensile strength of cross-ply CFRP specimens in the presence of a through-thickness compressive load.	4310-1 SIMPLE TOOLS FOR ASSESSING DELAMINATION GROWTH UNDER VARIABLE AMPLITUDE LOADS <i>Rhys Jones, Monash University</i>	4311-1 VERTICAL HEAT TRANSFER OF ALUMINUM COMPOSITE CLADDINGS <i>Kate Nguyen, Rmit University</i>	4312-1 EXPERIMENTAL AND NUMERICAL INVESTIGATION OF TENSILE BEHAVIOR OF CARALL FABRICATED WITH DIFFERENT FIBER ORIENTATION <i>Rishi Kumar Gupta, Indian Institute of Technology Patna</i> The tensile behaviors of carbon fiber aluminum laminates fabricated in three different configurations were studied using experiment, finite element simulation and maximum strength observed in Al/0°/ Al/0°/Al configuration with fiber pull out and delamination as a major failure mechanism.	4313-1 PERFORMANCE OF RARE EARTH ORGANIC COMPLEXES BASED LIGHT ACTIVATED SHAPE MEMORY POLYMER COMPOSITES <i>Madhubhashitha Herath, University of Southern Queensland</i> Incorporation of selectively triggered photothermal fillers and glass fibre reinforcements into shape memory polymer matrix has demonstrated the potential to develop light stimulus large-scale smart engineering applications.	4314-1 VALIDATION OF LASER BOND INSPECTION (LBI) TECHNOLOGY <i>Kara Storage, U.S. Air Force Research Laboratory</i> Because the ability to inspect bonded joints is considered a high priority within the composites community, the Air Force Research Laboratory has funded work to validate laser bond inspection (LBI).	4315-1 DESIGN AND ANALYSIS OF THE SPACECRAFT COMPOSITE PAYLOAD ADAPTER WITH LOCAL SUPPORTS <i>Evgeny Morozov, University of New South Wales At The Australian Defence Force Academy</i> Payload adapters are the structural elements that provide mechanical interface between spacecraft and a rocket launch vehicle. In this paper, new designs of the composite adapters are proposed and analysed.
1640-1700	4301-2 DEVELOPMENT OF A MODE I/ II/III TEST RIG FOR COMPOSITE LAMINATES AND SANDWICH FACE/ CORE FRACTURE CHARACTERIZATION <i>Pietro Sabbadin, Technical University of Denmark</i> The aim of this work consists in developing a novel test rig, which is inspired by the Shear Torsion Bending (STB) rig designed for unidirectional composites.		4303-2 3D GRAPHENE/ POLYMER NANOCOMPOSITES FOR HIGHLY SENSITIVE AND STRETCHABLE SENSORS <i>Shuying Wu, School of Engineering, Macquarie University</i> The present work demonstrates highly sensitive strain sensors based on 3D graphene network including graphene aerogel and vertical graphene. Effects of the microstructure of 3D graphene on sensing performance of its PDMS nanocomposites were systematically investigated.	4304-2 EXPERIMENTAL CALIBRATION AND VALIDATION OF POLYMER MATRIX COMPOSITES IN SUPPORT OF PROCESS MODELING <i>Thao Gibson, University of Dayton Research Institute</i> This paper discusses the experimental and characterization efforts required to support the development of a finite element-based computational simulation of polymeric thermoset polyimide composite processing.	4305-2 EVALUATION OF A FIBER BUNDLE TWISTING AT A CURVED SECTION OF 3D PRINTED CARBON FIBER COMPOSITES <i>Hirohide Shiratori, Tokyo Institute of Technology</i> The present study has revealed the twisting mechanism of a continuous carbon fiber bundle in a process of printing a curved section and evaluated its effect on the mechanical properties.	4306-2 DESIGNING FOLDABLE COMPOSITE STRUCTURES ON THE MICROMETRE SCALE <i>Arthur Schlothauer, ETH Zürich</i> The development of ultra-thin foldable composites for small scale applications (nano-satellites or heart-stents) is investigated with regard to maximizing stiffness whilst maintaining packagability.	4307-2 VIBRATION ATTENUATION PERFORMANCE OF HYBRID COMPOSITE LATTICE SANDWICH PANELS COMBINED WITH HIGH DAMPING MATERIALS <i>Jin-Shui Yang, Harbin Engineering University</i>			4308-2 SIMULTANEOUSLY INCREASING THE HYDROPHOBICITY AND INTERFACIAL ADHESION OF CARBON FIBRES: A SIMPLE PATHWAY TO INSTALL PASSIVE FUNCTIONALITY INTO COMPOSITES <i>Chantelle Arnold, Deakin University</i> The findings of this study dispel the common misconception of increased fibre wettability amounting to an increase in composite strength and provides a rapid method of installing surface functionality that facilitates adaptation of carbon fibres for new applications.	4309-2 NUMERICAL INVESTIGATION OF CNT REINFORCED COMPOSITE IN CRASH <i>Mohammad Rouhi, RISE SICOMP AB</i> Energy absorption in crash in composite materials is strongly dependent on the layup, fibre architecture and type of resin, e.g. thermoplastic vs. thermoset. Thus, modelling of the crash behaviour of composites is highly influenced by the chosen composite material system, and constitutive models have to some extent to be tailored to the system under consideration.	4310-2 DAMAGE RESISTANCE OF THREE-DIMENSIONALLY WOVEN CARBON FIBER COMPOSITES <i>Roberto Lopez-Anido, University of Maine</i> Damage resistance of a 3D woven composite was compared with that of a 2D baseline composite using drop-weight impact, energy absorption analysis, dent depth measurements, ultrasonic C-scan, and Micro-CT imaging.	4311-2 APPLICATIONS OF PULTRUDED FRP TUBES IN CIVIL INFRASTRUCTURE <i>Thiru Aravinthan, University of Southern Queensland</i> Fibre reinforced Polymers (FRP) have gained increased popularity in civil infrastructure applications in recent years. A review of field applications where pultruded FRP sections have been effectively used in civil infrastructure is presented.	4312-2 TENSILE AND THERMAL PROPERTIES OF TI/ CFRP LAMINATES BASED ON POLYIMIDE RESIN <i>Yubing Hu, Njust</i>	4313-2 HIGH PERFORMANCE CARBON FIBER REINFORCED SHAPE MEMORY EPOXY COMPOSITES <i>Yayun Liu, National Center for Nanoscience and Technology, CAS</i>	4314-2 THERMAL-FLOATING ROLLER PEEL BEHAVIOUR OF COMPOSITE-TI ADHESIVE JOINTS FOR REPAIR <i>Sridhar Isapalapati, Nanyang Technological University</i>	4315-2 DESIGN OF A COMPOSITE FISHBAC MORPHING DEVICE FOR SPANWISE LIFT CONTROL <i>Andres Rivero, Bristol Composites Institute (ACCIS) - University of Bristol</i> This paper introduces the use of the FishBAC morphing device -a composite camber morphing structure used for aerodynamic optimisation- for spanwise aerodynamic load control The study is performed using a fluid-structure interaction (FSI) model developed around Mindlin-Reissner Plate Theory (structures) and a viscous corrected lifting-line model (aerodynamics).
1700-1720	4301-3 MODE-II DYNAMIC CRACK INITIATION AND PROPAGATION BEHAVIOR OF CARBON FIBER/ EPOXY UNDER ELEVATED MOISTURE CONTENT <i>Rodrigo Chavez, University of California San Diego</i> The effect of moisture on the dynamic mode-II stress intensity factor of carbon fiber/ epoxy composites was studied. Notched carbon fiber/ epoxy specimens with high moisture contents were subject to dynamic fracture experiments . The samples were loaded under mode-II conditions and compared to samples with no significant moisture content.		4303-3 IMPROVED MECHANICAL AND BARRIER PROPERTIES OF GRAPHENE/ CARBON FIBRE- EPOXY HYBRID COMPOSITES <i>Xudan Yao, The University of Manchester</i> Graphene/carbon fibre/epoxy hybrid composites were fabricated through spray coating followed by resin infusion. Uniform distribution was achieved with barrier properties improved.	4304-3 NUMERICAL STUDY OF THE 3D-FLOW CHARACTERISTICS DURING COMPRESSION MOULDING OF SMC <i>Gustaf Alnersson, Gestamp Hardtech Ab</i> A numerical model for compression moulding of Sheet Moulding Compound based is presented, in which the charge is modelled as a fluid with a specified viscosity.	4305-3 EFFECTIVE TENSILE STRENGTH OF ADDITIVELY MANUFACTURED DISCONTINUOUS CARBON FIBER- REINFORCED POLYMER VIA COMPUTED TOMOGRAPHY <i>Patrick Strieman, University of Applied Science Ravensburg-Weingarten</i> A combination of destructive and non-destructive testing methods is used to compensate process-induced defects by additive manufacturing resulting in an effective tensile strength and a local material performance.	4306-3 TECHNOLOGICAL IMPLEMENTATION OF A TOROIDAL COMPOSITE PRESSUR VESSEL FOR HYDROGEN STORAGE <i>Norbert Schramm, LSE GmbH</i> The toroidal composite pressure vessel manufactured with new ring winding technology has a large mass saving potential (up to 30%) compared to cylindrical pressure vessels for hydrogen storage at 700 bar.	4307-3 THE ENERGY- ABSORBING CHARACTERISTICS OF COMPOSITE- REINFORCED HONEYCOMBS <i>Wesley Cantwell, Khalifa University</i>			4308-3 EVALUATION OF THE EFFECT OF TENSION DURING CARBON FIBRE PROCESSING <i>Claudia Creighton, Carbon Nexus, Deakin University</i>	4309-3 PRACTICAL INTERLAMINAR FRACTURE-BASED LIFE METHODS FOR BONDED AIRFRAME STRUCTURE <i>Carl Rousseau, Lockheed Martin Corporation.</i> A simplified fracture method was demonstrated and further development issues identified. The static ECT test was explored; ENF-based fatigue onset and growth tests were demonstrated; and recommendations made.	4310-3 EDGE IMPACT AND COMPRESSION AFTER EDGE IMPACT SIMULATIONS IN CFRP LAMINATES <i>Albertino Arteiro, University of Porto - Faculty of Engineering</i> A composite damage model is validated at higher levels of the test pyramid, accurately capturing the edge impact and compression after impact response of different composite laminates, opening new perspectives for its use on material qualification through virtual testing.	4311-3 AN ADAPTIVE BASE ISOLATOR FOR CLT STRUCTURES USING FIBER REINFORCED COMPOSITES <i>Wei Chong Liao, Feng Chia University</i>	4312-3 ACHIEVING GRADUAL FAILURE IN HYBRID COMPOSITE LAMINATES IN BENDING <i>Meisam Jalalvand, University of Strathclyde</i> Two hybrid composite beams are designed, tested and analysed to study their failure process. Unlike standard composites, these hybrid composites show a very successful gradual failure and a significant energy dissipation before final failure.	4313-3 GRAPHENE- CARBON BLACK- SILICONE RUBBER COMPOSITE FILMS WITH LOW TEMPERATURE- COEFFICIENTS OF RESISTANCE FOR LARGE STRAIN SENSORS <i>Velram Balaji Mohan, University of Auckland</i>	4314-3 HIGH TEMPERATURE TENSILE STRENGTH ANALYSIS OF C/ SIC COMPOSITE AND SUPERALLOY BOLTED JOINT STRUCTURE <i>Shuyuan Zhao, Harbin Institute of Technology</i> In this work, a progressive damage model for 2D woven C/SiC composite was established to predict high temperature tensile performance and failure behavior of single-lap, single-bolt 2D C/SiC composite and superalloy joint. The variations of failure strength with imposed temperature and bolt preload were discussed for the studied bolted joint.	4315-3 DESIGN AND FABRICATION OF W-SHAPED DEPLOYABLE COMPOSITE BOOM <i>Jiaqi Shi, Nanjing University of Aeronautics and Astronautics</i>

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Time	Plenary 2	Meeting room 205	Meeting room 206	Meeting room 208	Meeting room 209	Meeting room 210	Meeting room 211			Meeting room 212	Meeting room 213	Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
1720-1740	4301-4 COMPUTATIONAL MODELING OF LOW-VELOCITY IMPACT RESPONSE OF WOVEN CARBON LAMINATES IN ARCTIC CONDITIONS <i>Pavana Prabhakar, University of Wisconsin-madison</i>	NSF-AFOSR Joint Workshop on Mechanics-Based Design of Intelligent Material Systems by Multimaterial Additive Manufacturing	4303-4 HIGH GAS BARRIER PROPERTIES OF POLYMER/MOS2 NANOSHEET NANOCOMPOSITES <i>Jin Zhang, Deakin University</i> Hydroxyl-functionalized MoS2 nanosheets has shown obvious modification effect on a PVA polymer matrix, including ultralow helium gas permeability, high elongation at break and toughness and high in-plane thermal conductivity.	4304-4 MODELING COMPLEXITIES IN THE PROCESS SIMULATION OF POLYMERIC COMPOSITE MATERIALS <i>Robert Brockman, University of Dayton Research Institute</i> Composite process modeling presents unique challenges due to continuous evolution of key material properties. This paper discusses issues with adapting conventional test methods to process modeling, and the sensitivity of predictions to data measurement and reduction methods.	4305-4 LOAD PATH VISUALIZATION FOR FIBER TRAJECTORY OPTIMIZATION OF ADDITIVE MANUFACTURING COMPOSITES <i>Takuya Suzuki, IHI Corporation</i> A methodology of fiber trajectory optimization is proposed for Additive Manufacturing of composites. The strength and stiffness were simultaneously improved by the proposed method.	4306-4 ENHANCED INTERFACIAL PROPERTY OF CARBON FIBRE COMPOSITES BASED ON VERTICAL GRAPHENE <i>Zhao Sha, UNSW</i> The interfacial shear strength of carbon fibre and epoxy matrix was dramatically improved with vertical graphene grown on carbon fibre surface by plasma enhanced chemical vapor deposition method at relative low temperature.	4307-4 FABRICATION AND COMPRESSIVE BEHAVIORS OF CARBON FIBER REINFORCED COMPOSITE SANDWICH STRUCTURES WITH CURVED-CREASE FOLDCORE <i>Yuntong Du, Center for Composite Materials and Structures, Harbin Institute of Technology</i> A composite foldcore sandwich structure based on curved-crease origami is designed and fabricated. The curved-crease foldcore have a much better antibuckling capacity than chevron foldcore.			4308-4 AN EFFICIENT HIGH-THROUGHPUT GRAFTING PROCEDURE FOR ENHANCING CARBON FIBRE-TO-MATRIX INTERACTIONS IN COMPOSITES <i>Daniel Eyckens, Deakin University</i> This talk describes the chemical modification of the surface of carbon fibres by diazonium salts. The covalent attachment of of these salts to the surface was initiated through different means and the outcomes of each is discussed.	4309-4 MAPPING STRAINS AND FIBRE FRACTURE IN CARBON FIBRE COMPOSITES USING IN SITU DIGITAL VOLUME CORRELATION <i>Erich Schobert, University of Southampton</i> This paper presents a novel application of Digital Volume Correlation (DVC) and in situ Synchrotron Radiation Computed Tomography (SRCT) to uniaxial loading in Carbon Fibre Reinforced Polymers (CFRPs). DVC is a relatively novel tool for quantifying full-field volumetric displacements and implicit strain fields. It is shown that novel, mechanistically consistent measurements may be made in relation to fibre failure events.	4310-4 MAXIMISING THE FRACTURE RESISTANCE OF GLASS FIBRE COMPOSITES BY CONTROLLED LARGE SCALE FIBRE BRIDGING <i>Stergios Goutianos, Technical University of Denmark</i> In the present work, we aim to increase the fracture resistance of unidirectional composites by large scale fibre bridging. It is shown that the steady-state fracture resistance can be increased several times by modifying the fibre sizing and matrix material.	4311-4 TEXTILE REINFORCED CONCRETE COMPOSITES FOR ADVANCED CONSTRUCTION APPLICATIONS <i>Priyan Mendis, University of Melbourne</i> Open-hole compression of CFRP with aligned-CNT interlaminar reinforcement was conducted across various hygrothermal conditions. X-ray micro-computed tomography then employed for hot/ dry condition to reveal non-destructively the complex 3D damage progression.	4312-4 ENVIRONMEN-TAL EFFECTS ON NOTCHED COMPRESSION OF HIERARCHICAL NANOENGINEERED AEROSPACE COM-POSITES STUDIED BY X-RAY MICROTO-MOGRAPHY <i>Reed Kopp, Massachusetts Institute of Technology</i> Tensile damage evolution of plain weave ceramic matrix composites was studied by the in-situ nanofocus X-ray CT experiment and their progressive damage mechanisms were established.	4313-4 COMPOSITE ORIGAMI FOR FLUIDIC ARTIFICIAL MUSCLES <i>Michael Dicker, University of Bristol</i> Realising high-performance fluidic actuators by combining new origami designs with composite materials.	4314-4 DISCRETE DAMAGE MODELLING OF COUNTERSUNK FASTENED LAMINATED COMPOSITES IN BEARING <i>Alex Harman, Defence Science and Technology Group</i>	4315-4 DETAILED EVALUATION OF VISIBLE DEFORMATION IN CFRP LAMINATES SUBJECTED TO OUT-OF-PLANE IMPACT LOADING <i>Shin-ichi Takeda, Japan Aerospace Exploration Agency</i> The authors investigated visible deformation and internal damages of thermoset laminated CFRP owing to Out-of-plane impact loading.
		PANEL DISCUSSION															
1740-1800	4301-5 COMPARISON OF IN-PLANE COMPRESSIVE CHARACTERISTICS OF HEXAGONAL AND AUXETIC HONEYCOMBS WITH FIBRE REINFORCEMENTS <i>Zafer Kazanci, Queens University Belfast</i>		4303-5 UNDERSTANDING CNT DISPERSION IN POLYMER PRECURSOR SOLUTIONS AND PROPERTIES OF COMPOSITES FROM THE ATOMIC SCALE <i>Hendrik Heinz, University of Colorado Boulder</i>	4304-5 FINITE ELEMENT FORMING SIMULATION OF COMPLEX SANDWICH PANELS <i>Shuai Chen, The University of Nottingham</i>	4305-5 DESIGN OF HIGH TEMPERATURE RESISTANT THERMOPLASTIC COMPOSITES FOR FDM 3D PRINTING <i>Daniel Theriault, Polytechnique Montréal</i> This work presents the development of carbon fiber-reinforced high-temperature resistant thermoplastics featuring processability in melt mixing, printability for fused deposition modeling (FDM), and high mechanical properties to meet aerospace standards.	4306-5 EFFECT OF LIGHTNING STRIKE ON THE BUCKLING BEHAVIOUR OF COMPOSITE MATERIALS - A FINITE ELEMENT STUDY <i>Dhanya T M, Indian Institute of Technology Bombay, India</i> This article presents an experimentally investigation of quasi-static bending behavior of an innovative flax based sandwich structure and a reference material, typically used for truck walls and floors.	4307-5 USING FLAX FIBRES AND SHIVES IN SANDWICH STRUCTURES FOR TRANSPORT APPLICATIONS <i>Safa Essid, LOMC</i>		4308-5 ADAPTATION OF WEIBULL ANALYSIS TO REPRESENT STRENGTH BEHAVIOUR OF BRITTLE FIBRES <i>Faisal Islam, Mines ParisTech</i>	4309-5 ESTABLISHING DAMAGE SCENARIO OF RANDOMLY ORIENTED STRAND COMPOSITE USING MULTI-INSTRUMENTATION AND MICRO-CT <i>Loic Souffois, University of Compiègne</i> A damage scenario of randomly oriented strand thermoset composites is established under tensile loading. In this purpose, multi insrumentation including digital image correlation, acoustic emission, microscopy and tomography is used.	4310-5 DETECTION ON CURING PROCESS OF LARGE THICKNESS COMPOSITE USING FIBER BRAGG GRATING <i>Guowei Zhang, Beihang University</i> To investigate the temperature and strain history throughout the curing process of large thickness three-hundred-ply Kevlar/ epoxy composite laminate, the fiber Bragg grating (FBG) were adjacently embedded in the composite specimen to in situ monitor the temperature and strain evolution at 5 monitoring points along the thickness direction.	4311-5 IN-SITU X-RAY COMPUTED TOMOGRAPHY CHARACTERISATION OF TENSILE DAMAGE EVOLUTION IN TEXTILE CERAMIC MATRIX COMPOSITES <i>Daxu Zhang, Shanghai Jiao Tong University</i> Tensile damage evolution of plain weave ceramic matrix composites was studied by the in-situ nanofocus X-ray CT experiment and their progressive damage mechanisms were established.	4312-5 HETEROSTRUC-TURED {001} TiO2/G-C3N4 HYBRIDS GREATLY ENHANCED H2 PRODUCTION FROM WATER UNDER UV-VIS LIGHT IRRADIATION <i>Hui Zhang, Beijing University of Chemical Technology</i> Nanosheet array-like heterostructured hy-brids with {001}TiO2 in situ growth on g-C3N4 layers shows remarka-bly improved hydrogen evolution rate (26.2 mmol·g-1·h-1) under UV-vis light irradiation upon high separation efficiency of photocre-ated electron-hole.	4313-5 4D PRINTED PROGRAMMABLE STRUCTURES BASE ON ACTIVE SHAPE MEMORY POLYMER COMPOSITES <i>Qinghua Guan, Centre for Composite Materials and Structures, Harbin Institute of Technology</i> In this study, three programming methods of 4D printed composites and structures based on external loads, internal pre-strain and viscoelasticity were presented investigated here.	4314-5 JOINING OF AGEING RESISTANT STRUCTURES OUT OF LIGHT METALS AND CARBON COMPOSITES BY ULTRASONICS <i>Frank Balle, University of Freiburg, Department of Sustainable Systems Engineering</i>	4315-5 MODELING OF VOID EFFECT ON MATRIX-DOMINATED STRENGTH OF CFRP LAMINATES <i>Shigeki Aratama, Kawasaki Heavy Industries, Ltd.</i> Void locations and dimensions were statistically investigated using X-ray CT images. A model was proposed for the effect of voids on the reduction of matrix-dominated strength of CFRP laminates.	
1800-1820				4304-6 PREDICTING FATIGUE LIFE OF COMPOSITE MATERIALS <i>Wahid Ferdous, Centre for Future Materials (CFM), University of Southern Queensland</i>	4305-6 ADDITIVE MANUFACTURING OF ADVANCED FIBER REINFORCED COMPOSITES AND APPLICATIONS <i>Xiaoyong Tian, Xi'an Jiaotong University, China</i> Additive manufacturing for composite material structures has been investigated to fabricate components with integrated performance of material, structure, and functions, thus to overcome the bottleneck problems in the fields of additive manufacturing and composites.	4306-6 BUCKLING BEHAVIOUR OF UD CARBON/EPOXY PANELS SUBJECTED TO DIRECT LIGHTNING STRIKE <i>Ole Thybo Thomsen, University of Southampton, School of Engineering</i>			4309-6 THE CRITICAL FIBRE BREAK CLUSTER FOR LONGITUDINAL TENSILE FAILURE OF UNIDIRECTIONAL COMPOSITES: MISCONCEPTIONS AND NEW INSIGHTS <i>Yentl Swolfs, KU Leuven</i> The common misconception that the critical cluster originates from the largest cluster prior to failure is debunked, and fibre-hybridisation is shown to significantly stabilise large clusters.	4310-6 USE OF DESERT-SANDS TO SYNTHESIZE MGSI03-SiC COMPOSITE CERAMICS <i>Zhiming Shi, Inner Mongolia University of Technology</i> The present work aims to synthesize the MgSiO3-SiCp composite ceramics using natural desert-sand and to evaluate their microstructure and properties.	4311-6 DYNAMIC MECHANICAL IN-SITU ANALYSIS OF CERAMIC MATRIX COMPOSITES AT 1300°C IN OXIDIZING ATMOSPHERE <i>Christian Kudisonga, The University of Queensland</i>	4312-6 PREPARATION OF HOLLOW SiO2/ POSS/FLUORINATED POLY(2,5-THIENYLB-ENZOBISOXAZOLE) NANOCOMPOS-ITE FILMS WITH ULTRA-LOW DIELEC-TRIC CONSTANT <i>Zhe Zhang, East China University of Science and Technology</i> A novel method to fabricate 6FP-BO-POSS-HMS nanocomposite films with ultra-low dielectric constant, excellent mechanical properties and high-temperature resistance.	4313-6 THREE-DIMENSIONAL CONSTITUTIVE MODEL OF SHAPE MEMORY POLYMER COMPOSITES CONSIDERING RATE-DEPENDENT BEHAVIOUR <i>Jinsu Kim, Seoul National University</i>	4314-6 INCREASING THE STRENGTH OF MECHANICALLY JOINED CONNECTIONS OF METAL AND FIBER-REINFORCED PLASTICS USING A STRUCTURED AUXILIARY JOINING ELEMENT <i>Marcel Droß, Technische Universität Braunschweig, Institute of Machine Tools and Production Technology</i> The low plasticity in comparison to metals represents a limiting factor for fiber-reinforced plastics in mechanical joining systems. Therefore, the present study aims at a pin-structured auxiliary joining element as a new technology support for increasing the load-bearing capacity of mechanical joints between metal and fiber reinforced plastics.			
1845-2230	ICCM Conference Banquet Melbourne Room, MCEC																

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Time	Plenary 2	Meeting room 206	Meeting room 209	Meeting room 212	Meeting room 213		Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
0800-0805	Day 5 Welcome & Announcements											
0805-0850	PLENARY LECTURE: CHALLENGES IN COMPOSITES FOR MARINE STRUCTURES <i>Yapa Rajapakse, United States Office of Naval Research, USA</i> Plenary 2											
0850-0900	Move to concurrent sessions											
0900-1040	5101 Polymer matrix materials	5103 Defence	5105 Aerospace	5108 Composite structures	5109 Fracture and damage		5110 Rail	5111 Biocomposites	5112 Composite materials	5113 Process modelling	5114 Joints	5115 Sandwich structures and materials
0900-0930	KEYNOTE 1: AMELOGENESIS: NATURE'S 3D PRINTING SYSTEM FOR MULTI-SCALE LAMINATES <i>Brian Cox (Plenary 2)</i> KEYNOTE 2: MANUFACTURING RELATED DEFECTS -WHERE AND WHY THEY OCCUR, AND DO THEY MATTER? <i>Simon Bickerton, Auckland University</i> (Meeting room 212) KEYNOTE 3: RESIN INFUSION COMPOSITES FOR AEROSPACE <i>Michael Edwards, Boeing Australia</i> (Meeting room 213) KEYNOTE 4: MULTI-SCALE MODELING OF FIBER-REINFORCED PLASTIC COMPOSITES: FROM ATOMISTIC MODELING TO STRUCTURAL DESIGN <i>Tomonaga Okabe, Tohoku University</i> (Meeting room 219)											
0930-0940	Move to concurrent sessions											
0940-1000	5101-1 BACTERIAL CELLULOSE-POLYCAPROLACTONE COMPOSITES AS ENVIRONMENTAL MATERIALS <i>Takao Aoyagi, Nihon University</i> We have been studying on effective defibration of bacterial cellulose (BC) and recently found that polycaprolactone-grafted BC suspension was very useful to prepare a thermo-responsive membrane to control drug permeation.	5103-1 MODELLING COMPACTION VARIABILITY IN OUT-OF-AUTOCLAVE PREPREG LAMINATE <i>Daria Bontch-Osmolovskaia, USQ</i> This paper proposes an experimental method for imaging the flow of trapped air through a OOA prepreg laminate stack. The goal is to quantify the volume of air, trapped between the plies during the manufacturing process which will cause the undesirable porosity in the cured part.	5105-1 VULNERABILITY OF COMPOSITE STRUCTURE FUSELAGE UNDER INTERNAL BLAST EFFECTS: MITE APPROACH <i>Francis Collombet, Clement Ader Institute</i> In this paper, thickness of a sandwich radome which consisits of two dense dielectric skins by a less dense core having a lower relative dielectric constant than the skin are determined by Maxwell equations for highest transmission coefficients and stiffness.	5108-1 TRUNCATED SPHERICAL COMPOSITE SHELL FOR TRANSMITTING ELECTROMAGNETIC WAVE AND BEARING CAPACITY UNDER WIND LOAD <i>Lili Tong, Harbin Engineering University</i>	5109-1 NEW INTERFACE ELEMENT WITH NON COINCIDENT NODES TO SIMULATE DISCRETE DAMAGE IN COMPOSITE LAMINATE <i>Antoine Trelly, Isae Supaero - Segula Sad</i>		5110-1 COMPOSITE MATERIALS FOR THE RAILWAY SECTOR <i>Roberto Guzman De Villoria, FIDAMC</i>	5111-1 EFFECT OF DIFFERENT SURFACE TREATMENTS ON CURAUA FIBERS <i>Lincoln Teixeira, University of Brasilia</i>	5112-1 FORMABILITY SIMULATION OF STEEL-POLYMER SANDWICH COMPOSITES <i>Sungjin Han, Seoul National University</i> Sandwich structures and materials	5113-1 VIRTUAL AND EXPERIMENTAL HYBRID THERMOFORMING OF GFRP AND ALUMINUM <i>Michael Grubenmann, inspire IVP</i> A hybrid thermoforming process of glass fibre-reinforced thermoplastic and aluminum considering process parameters, tool geometry and validation experiments is experimentally and virtually investigated.	5114-1 INTERLOCKING INTERFACE DESIGN IN METAL-CFRP JOINTS USING A MONTE-CARLO SIMULATION APPROACH <i>Fabian Günther, Tu Dortmund University</i> In experimental single lap joint test and FEM simulations the qualitative and quantitative positioning of mesoscale pin structures in interlocking CFRP joints are developed by a Monte-Carlo approach.	5115-1 STUDY ON THE LOW-VELOCITY IMPACTING RESPONSES AND RESIDUAL PROPERTIES OF COMPOSITE SANDWICHES <i>Xintao Huo, Hunan University</i> This paper revealed the impacting mechanism of foam sandwich structures. Numerical and analytical models were developed to support the design of structural crashworthiness. Besides, the residual properties were also considered
1000-1020	5101-2 EPOXY NETWORKS DERIVED FROM NOVEL AMINES <i>Russell Varley, Deakin University</i>	5103-2 BALLISTIC IMPACT ON COMPOSITE-COVERED CERAMIC AND THE EFFECT ON PROJECTILE FRAGMENTATION <i>Bernt B. Johnsen, Norwegian Defence Research Establishment (FFI)</i> A composite cover on alumina can improve the ballistic performance. The highest effect was with a cover on the back of the alumina, and not on the strike face.	5105-2 INFLUENCE OF SHOCKWAVE ON LIGHTNING DAMAGE OF CFRP LAMINATE <i>Yoshiyasu Hirano, Japan Aerospace Exploration Agency</i>	5108-2 ANALYSIS AND TESTING OF A THERMOPLASTIC COMPOSITE STIFFENED PANEL UNDER COMPRESSION <i>Kevin Van Dooren, Delft University of Technology</i> The analysis and test results of a thermoplastic composite stiffened panel under compression will be presented. Skin-stringer separation has been modelled by VCCT and will be validated by experimental testing.	5109-2 COMPARATIVE ANALYSIS OF MODELLING TECHNIQUES FOR IMPACT ON THICK FABRIC COMPOSITE STRUCTURES <i>Niels Van Hoorn, NLR - Netherlands Aerospace Centre</i> A comprehensive characterisation of damage due to impact events on thick fabric composite structures remains an elusive and challenging task. Three methods with varying degrees of computational complexity are developed to simulate and predict a representative impact problem.		5110-2 INFLUENCE OF ENDPOST MATERIALS ON SUB-SURFACE RAILHEAD MATERIAL DAMAGE OF INSULATED RAIL JOINTS DUE TO WHEEL/RAIL CONTACT LOADINGS <i>Nirmal Mandal, Central Queensland University</i>	5111-2 BAMBOO FIBRE COMPOSITES - MOISTURE RESISTANT AND DURABLE <i>Aart Willem Van Vuure, KU Leuven</i> Bamboo fibres show high potential for use in composites due to combination of good mechanical properties, abundant availability, high Carbon capture capability and the fact that they keep their mechanical properties at high humidity.	5112-2 TIDAL TURBINE BLADE COMPOSITES USING BASALT FIBRE REINFORCED POWDER EPOXY <i>Conchur Bradaigh, University of Edinburgh</i> Renewable energy	5113-2 EVALUATION AND SIMULATION ON THE MOLDING PROCESS OF CHOPPED CARBON FIBER TAPE REINFORCED THERMOPLASTICS <i>Tiansheng Han, The University of Tokyo</i> This research aims to evaluate the compression molding outcome of a specific short fiber ROS CFRTP named as UT-CTT utilizing the analysis of charge ratio and thickness of free-edge samples and simulate the process with a new modeling technology implemented in LS-DYNA®, and eventually leads to mechanical property prediction based on the pre-set molding conditions.	5114-2 MICROPINNED JOINTS UNDER LAP SHEAR LOADING CONDITIONS <i>Simon Inverarity, Rmit University</i> We present a new approach to micropinned joints which involves interference fitting, and its effect is characterised for a composite-to-metal joint under lap shear loading.	5115-2 UTILIZATION OF A LAYERED NANOCOMPOSITE CONSTRUCTED BY LITAWO6 NANOSHEETS AND COBALT PORPHYRIN AS ELECTRO-CATALYST TO OXYGEN REDUCTION <i>Jinpeng Li, East China University of Science and Technology</i> Layered nanocomposite CoTMPyP/LiTaWO6 was constructed by exfoliation / self-assembling method, and the electrocatalytic activity of nanocomposite to oxygen reduction reaction was tested.
1020-1040		5103-3 NUMERICAL MODELLING OF UHMWPE COMPOSITES UNDER IMPACT LOADING <i>Behjat Ansari, University of Bristol</i> A finite element model is developed to predict energy absorption at the interfaces of UHMWPE laminates under varying rates of impact.	5105-3 DESIGN PROCEDURES FOR IMPROVED LAMINATE PERFORMANCE IN BENDING AND EXTENSION <i>Jason Lee, University of Glasgow</i> This article discusses improved laminate performance relating to both in-plane properties (e.g. first ply failure) and out-of-plane properties (e.g. initial buckling) using double angle-ply laminates (with ±Ψ and ±Φ ply orientations), which are stiffness matched to standard laminate configurations.	5108-3 EVALUATION OF MOLDING PROCESSES EFFECTS ON INTERNAL GEOMETRY OF RANDOMLY ORIENTED STRANDS <i>Yi Wan, The University of Tokyo</i> The internal geometry property, which is considered the key factor that combines the inner structure with mechanical properties, is evaluated for randomly oriented strands both quantitatively and visually under different molding processes.	5109-3 LOCAL AND NONLOCAL CONTINUUM DAMAGE SIMULATION OF IMPACT AND COMPRESSION AFTER IMPACT TESTS ON CFRP LAMINATES <i>Reza Vaziri</i>			5111-3 COMPOUNDING NATURAL FIBERS WITH HIGH PROCESS TEMPERATURE-THERMOPLASTICS WITH SOLID-STATE SHEAR PULVERIZATION: FLAX/ POLYAMIDE 6 <i>Katsuyuki Wakabayashi, Bucknell University</i> A chilled twin screw extrusion process called Solid-State Shear Pulverization effectively compounds natural fibers with polymers that are conventionally incompatible because of their high processing temperature.	5112-3 NEW HYBRID MATERIALS BASED ON CARBON NANOTUBES AND METAL ALLOYS <i>Damian Kulawik, Jan Dlugosz University</i> Hybrid composites	5113-3 STRENGTH ANALYSIS USING THE RESULT OF COMPRESSION MOLDING SIMULATION FOR LONG CARBON FIBER REINFORCED THERMOPLASTICS <i>Shinya Hayashi, JSOL Corporation</i> New compression molding simulation techniques for long fiber CFRP using a beam-in-adaptive solid coupling function and a component strength analysis using the deformed beams are presented.		5115-3 COMPOSITE SANDWICH OPTIMIZATION OF A STIFFENED PANEL STRUCTURE <i>Yasser M. Meddaikar, DLR - German Aerospace Center</i> Optimization strategy for sandwich composites based on lamination parameters, applied to a stiffened panel problem.
1040-1110	Coffee break Exhibition hall											
1100-1230	5201 Dynamic properties and fracture	5203 Multiscale modelling	5205 Advanced manufacturing and automation	5208 Composite structures	5109 Fracture and damage		5210 Damage tolerance	5211 Biocomposites	5212 Interfaces & interphases	5213 Process modelling	5214 Joints	5215 Sandwich structures and materials
1110-1130	5201-1 NUMERICAL INVESTIGATION ON THE LOADING METHODS AND SIZE EFFECT FOR COMPRESSION RESPONSE OF BRAIDED COMPOSITES <i>Peng Liu, Northwestern Polytechnical University</i> The effects of sample size and loading methods on compression response of the triaxially braided composite are numerically investigated using the meso-scale finite element method.	5203-1 DUAL PHASE VOID PREDICTION IN MICROSCOPIC YARN MODELS <i>Silvio Faccioto, Institute of Aircraft Design - University of Stuttgart</i>	5205-1 COMPOSITE COIL SPRINGS MADE BY 4D PRINTING METHOD <i>Suong Hoa, Concordia University</i> Characteristics of composite coil springs made by the method of 4D printing are presented. In this method, the structure changes from initial simple shape to the final complex shape after curing and cooling.	5208-1 BUCKLING AND STRENGTH ANALYSIS OF VARIABLE STIFFNESS PANELS MANUFACTURED BY FABRIC STEERING TECHNOLOGY <i>Zhaofei Xiao, University of Glasgow</i>	5209-1 DETERMINING THE TRUE TENSILE FAILURE STRAIN OF CARBON FIBRE COMPOSITES AND FACTORS AFFECTING IT <i>Michael Wisnom, Bristol Composites Institute (ACCIS)</i> Novel tests show that specimen volume and ply thickness have a much greater effect on tensile failure strain of carbon-epoxy than other stress components.		5210-1 A PLATE MODEL FOR DAMAGE TOLERANCE PREDICTION AND DESIGN FOR MULTI-AXIAL LOADING <i>Mark Nielsen, University of Bath</i> A new semi-analytical method for predicting the strain at which delamination propagation will initiate following sublaminate buckling. Adaptation for design optimisation is included, showing benefit of non-standard surface plies.	5211-1 GRAFTING TOUGHENING OF PERITUBULAR DENTINE IN BIOLOGICAL POROUS MICROSTRUCTURE <i>Rong Wang, Xi'an Jiaotong University</i> The role of PTD microstructure on the fracture properties of human dentine is investigated by analysis of its crack tip shielding effect on microcracks and macrocracks.	5212-1 GRAFTING CARBON NANOTUBES ON CARBON FIBER SURFACE AND ENHANCING THE INTERFACIAL PROPERTIES OF COMPOSITES <i>Shu Xiong, Beihang University</i> Interfaces and interphases	5213-1 MODELLING OF THE HIPERDIF METHOD FOR MANUFACTURING RECYCLED COMPOSITES USING SPH <i>Samantha Huntley, University of Bristol</i> HiPerDiF enables remanufacturing reclaimed carbon fibres into commercially-valuable products by ensuring a high-level of fibre alignment. The fluid dynamic alignment process is modelled using SPH and the model is validated.	5214-1 COHESIVE ZONE MODEL IDENTIFICATION ON MODE I BONDED ASSEMBLY: SENSITIVITY AND ROBUSTNESS ANALYSIS <i>Agathe Jallou, Isae-supaero</i>	5215-1 INTERFACIAL ADHESION BETWEEN CARBON FIBRE THERMOPLASTIC COMPOSITES AND FOAM IN SANDWICH STRUCTURES <i>Le Quan Ngoc Tran, Singapore Institute of Manufacturing Technology, A-STAR</i> In this study, several investigations of the skin-core interface of sandwich structures are conducted, including physico-chemical interactions based on surface energies and mechanical interlocking influenced by foam surface morphology.

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Time	Plenary 2	Meeting room 206	Meeting room 209	Meeting room 212	Meeting room 213		Meeting room 214	Meeting room 215	Meeting room 216	Meeting room 217	Meeting room 218	Meeting room 219
1130-1150	5201-2 EFFECT OF MICROSTRUCTURE AND STRAIN-RATE ON THE TRANSVERSE COMPRESSIVE STRENGTH OF UHMWPE COMPOSITES <i>Jason Parker, Johns Hopkins University</i>	5203-2 INFLUENCE OF FIBER ORIENTATION RECONSTRUCTION ON MECHANICAL PROPERTIES OF SHORT FIBER REINFORCED THERMOPLASTICS <i>Kevin Breuer, Chair of Plastics Technology</i> Fiber orientation is reconstructed by spherical harmonics as well as by method of maximum entropy. Subsequently, representative volume elements are generated to investigate the influence on the effective composite properties.	5205-2 VIRTUAL MATERIAL CHARACTERISATION OF 3D COMPOSITES <i>Bruce Cartwright, Pacific Engineering Systems International Pty Ltd</i>	5208-2 MECHANICAL PERFORMANCE OF HIERARCHICAL PYRAMIDAL LATTICE MATERIALS AND IT’S THREE DIMENSIONAL FAILURE MECHANISM MAPS <i>Jian Xiong, Center for Composite Materials and Structures, Harbin Institute of Technology</i>	5209-2 EFFECT OF PLY THICKNESS ON IMPACT DAMAGE MODE OF THIN PLY CFRP LAMINATES <i>Kohei Yamada, Industrial Technology Center of Fukui Prefecture</i> In this study, impact tests and CAI tests varying the impact energies were conducted using quasi-isotropic laminates which had different ply thickness (0.02, 0.12, 0.24 mm).		5210-2 LOW VELOCITY IMPACT MODELLING ON LAMINATE COMPOSITE: AN INDUSTRIAL APPLICATION <i>Patrick Peres, ArianeGroup</i> Industrial validation methodology of low velocity impact computation based on experimental results with CFRP for different sizes of sample.	5211-2 BIOCOMPATIBILITY OF B-CA3(PO4)2/MG-ZN COMPOSITES PREPARED BY POWDER METALLURGY <i>Kun Yu, School of Materials Science and Engineering, Central South University</i>	5212-2 PHOSPHORUS BASED A-AMINO ACID MIMETIC FOR ENHANCED FLAME RETARDANT PROPERTIES IN AN EPOXY RESIN <i>Melissa Stanfield, Deakin University</i> This project employs surface electroinitiated emulsion polymerisation (SEEP) process to modify carbon surfaces; focusing on generating multilayer interfaces to induce novel physical and chemical properties in carbon fibre reinforced composites. This process is rapid, scalable, and able to be applied to any conductive surface.	5213-2 SIMULATION OF THE RESIN TRANSFER IN A TRI-AXIALLY BRAIDED PREFORM USING EFFECTIVE PERMEABILITY <i>Hye-gyu Kim, Ulsan National Institute of Science and Technology</i> Numerical simulations for the resin transfer molding process are performed to observe the resin flow through the tri-axial braided preform, including the temperature effect.	5214-2 INDUCTION WELDING BEHAVIOR OF WOVEN-CF/PPS LAMINATES USING HIGH FREQUENCY CONTINUOUS INDUCTION HEATING <i>Kurima Kazuki, KINDAI University</i> This study clarified the behavior of induction welding of woven-CF/PPS laminates using the high frequency power supply of around 2.0MHz.	5215-2 EXPERIMENTAL FORMABILITY STUDY OF STEEL-POLYMER SANDWICH COMPOSITES <i>Jewook Yang, Seoul National University</i>
1150-1210	5201-3 EXPERIMENTAL CHARACTERIZATION OF STRAIN-RATE SENSITIVITY ON FAILURE PROPERTIES OF CARBON/EPOXY COMPOSITE <i>Fabien Coussa, Onera</i>	5203-3 ANISOTROPIC THERMO-VISCOELASTIC RESIDUAL STRESS MODEL FOR WARPAGE SIMULATION OF INJECTION MOLDED PARTS <i>Zhiliang Fan, Autodesk Australia Pty Ltd</i>	5205-3 MULTIPLE-FRONT POLYMERIZATION FOR RAPID COMPOSITE MANUFACTURING <i>Polette Centellas, University of Illinois At Urbana-champaign Pty Ltd</i> Frontal polymerization offers significant cure time savings over conventional composite manufacturing. Applying a local heat trigger initiates polymerization; therefore, using multiple triggers further reduce cure times and enable large-scale manufacturing.	5208-3 EFFECT OF ABSORBENT FOAM FILLING ON MECHANICAL BEHAVIORS OF 3D PRINTED HONEYCOMBS <i>Leilei Yan, Northwestern Polytechnical University</i>	5209-3 A SIMPLE MODELING APPROACH TO PREDICTING DAMAGE PROGRESS IN UNIDIRECTIONALLY ARRAYED CHOPPED STRAND LAMINATES <i>Shigeki Yashiro, Kyushu University</i>		5210-3 LOW-VELOCITY IMPACT SIMULATION WITH A SPECIAL FOCUS ON THICK COMPOSITES <i>Ronny Sachse, Institut für Flugzeugbau - Universität Stuttgart</i> This paper investigates the influence of laminate thickness on damage initiation and propagation during low velocity impact. An enhanced cohesive zone model and impact simulations for validation are presented.	5211-3 TUNING THE MECHANICAL AND THERMO-MECHANICAL RESPONSES OF BIO NANOCOMPOSITE FILMS OF PLASTICIZED POLYLACTIC ACID WITH HALLOYSITE NANOTUBES <i>Swati Sharma, IIT DELHI</i> Poly-lactic acid (PLA), a polyester derived from natural resources had been modified in this work to improve its ductility with the help of plasticizer. To compensate for the decrease in tensile strength, halloysite nanotubes (HNT) have been incorporated in plasticized PLA.		5213-3 EFFECT OF CURING CYCLE ON THE STRENGTH OF UAV COMPOSITE WING STRUCTURES <i>Zhendong Liu, School of Aeronautics, Northwestern Polytechnical University, Xi'an, China</i>	5214-3 CARBON FIBER/PEEK RIVETS FOR FASTENING COMPOSITES STRUCTURES <i>Louis Laberge Lebel, Polytechnique Montreal</i> C/PEEK rivets were molded-in CFRP and Steel joints by Joule heating and pressure. The tested shear strength is higher than typical aerospace grade aluminum rivets.	5215-3 ON A BEAM ON ELASTIC FOUNDATION ANALYSIS MODEL FOR SANDWICH SCB TEST SPECIMEN <i>Kazuya Takaryu, Kanazawa Institute of Technology</i> Points to be noted on applying an analysis model named "beam on Vlasov foundation model" to sandwich SCB test specimen are discussed.
1210-1230			5205-4 APPLICATION OF AUTO-MATIC LAY-UP AND IN-SITU CONSOLIDATION TO THE DEVELOPMENT OF A REINFORCED WING SKIN COVER – OUTCOME PROJECT <i>Maria Isabel Martín, Fidamc</i>	5208-4 DESIGN AND COPPRESSIVE PROPERTIES OF LONG-LASS-FIBER REINFORCED THERMOPLASTIC OCTAHEDRAL LATTICE STRUCTURE <i>Yueqing Zhao, Beihang University</i> In this paper, compressive properties of diverse octahedral lattice structures assembled by nonplanar cross-shaped parts by mechanical interlocking method were investigated.	5209-4 EXPERIMENTAL INVESTIGATION OF MICRO/MACROSCALE DAMAGE MECHANISM IN THERMOPLASTIC COMPOSITES UNDER QUASI-STATIC AND IMPACT <i>Arief Yudhanto, Kaust (King Abdullah University of Science and Technology)</i>		5210-4 ENHANCING THE DAMAGE TOLERANCE OF SRPP/CFPP HYBRID COMPOSITES VIA A BIO-INSPIRED DESIGN <i>Lorenzo Mencattelli, Imperial College London</i> We successfully designed micro-engineered SRPP/CFPP structures via tailoring laser-cut patterns to meet different damage tolerance requirements at different locations within the same structure, creating engineering solutions of significant industrial impact.	5211-4 BIOINSPIRED ARCHITECTURES TOWARD IMPROVING DAMAGE RESISTANCE ON CFRP LAMINATES <i>Luís Amorim, University of Minho</i> Under low velocity impact, the bioinspired CFRP laminates proposed have shown more tolerance to damage onset and less prone to larger damages, when compared to a standard aeronautic one.		5214-4 MECHANICAL DIRECT JOINING BETWEEN CFRTP AND METAL SHEET USING HIGH FREQUENCY INDUCTION HEATING <i>Kaname Fujisaku, Nippon Institute of Technology</i> Joining method between aluminum sheet and CFRTP (Carbon Fiber Reinforced Thermo-Plastic) sheet without rivets by using induction heating was discussed, and joining strength were investigated.	5215-4 BUCKLING EXPERIMENTS AND ANALYSIS OF THE SOFT-CORE SANDWICH BEAMS <i>Dongjian Zhang, School of Aeronautics, Northwestern Polytechnical University</i>	
1230-1330	Lunch Exhibition hall											
1330-1510	5301 Polymer matrix materials	5303 Mechanics of composites	5305 Advanced manufacturing and automation	5308 Fibers			5310 Repair			5313 Process modelling	5314 Aerospace	5315 Structural analysis and optimisation
1330-1350	5301-1 EFFECT OF NOVEL INTUMESCENT FLAME RETARDANT ON THERMAL STABILITY AND FLAME RETARDANCY PROPERTIES OF CONTINUOUS GLASS FIBRE REINFORCED POLYPROPYLENE COMPOSITES <i>Hongda Chen, Wuhan University of Technology</i>	5303-1 A SOLUTION TO THE DOUBLE CRACK’S J-INTEGRAL IN THE PLAIN PLATE <i>Huan Li, Harbin Engineering University</i>	5305-1 AUTOMATED FIBER PLACEMENT AND VARIO THERMAL PRESSING OF THERMOPLASTIC TOWPREGS <i>Peter Mitschang, Institut für Verbundwerkstoffe GmbH</i>	5308-1 TENSILE PROPERTIES OF NANOCELLULOSE REINFORCED SILKWORM SILK COMPOSITE FIBERS <i>Chen Wu, Tohoku University</i>			5310-1 TENSILE STRENGTH PREDICTION OF BOLTED REPAIR ON COMPOSITE LAMINATE <i>Xiang Li, China Academy of Engineering Physics</i>			5313-1 FINITE ELEMENT MODELING OF LAYUP PROCESS WITH HEAT TRANSFER AND DEFORMATION OF CFRTP <i>Masaaki Nishikawa, Department of Mechanical Engineering and Science</i> The present study analyzed the heat transfer and viscoelastic deformation of the materials during the thermal processing of CFRTP, using coupled simulations based on finite element method.	5314-1 A NOVEL METHODOLOGY TO QUANTIFY SHAPE COMPLEXITY OF COMPOSITE AEROSPACE PARTS <i>Mohammad Tanvir Chowdhury, The University of Nottingham</i> This paper introduces a new metric to quantify the Shape Complexity of composites aerospace parts using CAD information from early design stages.	5315-1 A NEW ANALYTICAL MODEL TO PREDICT THE STIFFNESS OF FILAMENT WOUND COMPONENTS <i>Michael Heitzmann, The University of Queensland</i>
1350-1410	5301-2 ISOTHERMAL CRYSTALLIZATION MODELING OF PEKK COMPOSITES: KINETIC AND MORPHOLOGY PREDICTIONS <i>Olivier De Almeida, Institut Clément Ader - IMT Mines Albi</i> Microscopy and DSC techniques are used to model PEKK isothermal crystallization kinetics with a coupled kinetic equation. Transcrystallinity induced by carbon fibres is investigated and simulated by means of a pixel coloring method.	5303-2 MODELLING OF MECHANICAL BEHAVIOUR OF MXENE/POLYMER NANOCOMPOSITES <i>Gediminas Monastyreckis, Kaunas University of Technology</i> This study was aimed to investigate the mechanical properties of MXene/polymer nanocomposites. The finite element modelling of a single MXene flake and MXene/polymer nanocomposite was performed under tension conditions.	5305-2 ENHANCEMENTS ON AUTOMATED PREFORMING FOR COMPOSITE STRUCTURES <i>Florian Helber, Institute of Aircraft Design</i>	5308-2 HIGH-PERFORMANCE CELLULOSE NANOCOMPOSITE FIBRES AS SUSTAINABLE COMPOSITE REINFORCEMENT <i>Chenchen Zhu, University of Bristol</i>			5310-2 DESIGN AND ANALYSIS OF SCARF REPAIRS WITH CIRCULAR AND ROUNDED RECTANGULAR REPAIR CUTOUTS <i>Sridhar Idapalapati, Nanyang Technological University</i>			5313-2 MULTISCALE MODELING OF THERMOSET COMPOSITE PROCESS-INDUCED RESIDUAL STRESSES <i>Marianna Maiaru, Michigan Technological University</i> A novel multi-scale Integrated Computational Material Engineering (ICME) approach to predict the evolution of residual stress during curing of thermoset composites is presented.	5314-2 NUMERICAL SIMULATION OF FOLDABLE SHELL EXTENDIBLE TUBE OF UNIDIRECTIONAL COMPOSITE <i>Yuki Doto, Department of Aeronautics and Astronautics, University of Tokyo, Tokyo, Japan</i> About a new deployable structure made of shells and a film, FEM and experiments were conducted to investigate its extending behavior and deployability.	5315-2 ON THE PARAMETERIZATION OF ORTHOTROPIC LAMINATES TO OPTIMIZE COMPOSITE STRUCTURES <i>François-Xavier Irisarri, Onera</i> This presentation deals with the optimization of orthotropic laminates using lamination parameters. An additional variable defines the orientation of the material axes of symmetry. Link is made with polar parameters.

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1410-1430	<p>5301-3 EFFECT OF CERAMIC PARTICLE SIZE ON PERFORMANCE OF RESIN MATRIX COMPOSITE FRICTION MATERIAL <i>Xuesong Fu, Dalian University of Technology</i></p> <p>Particle size has a significant influence on the friction mechanisms. Oversized particles improve the wear resistance of materials, but without causing excessive disc wear.</p>	<p>5303-3 A NEWTONIAN-MECHANICS-BASED MECHANISM CONTROL PROTEIN FOLDING <i>Lin Yang, Harbin Institute of Technology</i></p>	<p>5305-3 LASER-ASSISTED THERMOPLASTIC TAPE PLACEMENT: EFFECTS OF THERMAL HISTORY AND PLACEMENT SPEED ON WEDGE PEEL STRENGTH OF CF/PA6 <i>Victoria Zinnecker, National University of Australia</i></p> <p>This paper investigates the effect of three different tape placement speeds and six different process temperatures on the wedge peel strength of unidirectional CF/PA6 laminates manufactured in a laser-assisted tape placement process.</p>	<p>5308-3 TENSILE PROPERTIES OF SINGLE CARBON FIBRES TESTED WITH AUTOMATED EQUIPMENT <i>Francisco Mesquita, KU Leuven</i></p> <p>An extensive amount of single carbon fibre tensile properties were gathered using automated equipment. The fibre diameter, tensile strength and stiffness were analysed. Some fibres showed unexpected results, providing new insights on single fibre testing.</p>			<p>5310-3 A NOVEL APPROACH FOR HYBRID BONDED REPAIR OF PRIMARY METALLIC STRUCTURES <i>Paul Chang, Defence Science and Technology</i></p>			<p>5313-3 COMPATIBILITY INDEX FOR DEFECT FREE FORMING WITH DOUBLE CURVATURE <i>Andrew Rhead, University of Bath</i></p> <p>A compatibility index that identifies stacking sequences which minimise defect formation is experimentally validated via forming of various stacking sequences onto a complex tool using an industrial double diaphragm former.</p>	<p>5314-3 THE INTERPLAY OF COMPOSITE DEGRADATION MECHANISMS FOR LONG LIFETIME AIRCRAFT OPERATION <i>Katherine Grigoriou, Rmit</i></p>	<p>5315-3 MECHANICAL EVALUATION ON SUS410-CFRP HYBRID PIN OF HEAVY LOAD LONG PITCH ROLLER CHAIN <i>Chang Uk Kim, Changwon National University</i></p> <p>In this study, structural analysis of a heavy - load long pitch roller chain was carried out and the metal/composites pin was manufactured and evaluated using CFRP.</p>
1430-1450	<p>5301-4 FUNCTIONALIZATION OF COPOLYMERS WITH HYDROXYL GROUPS VIA THE BENZOXABOROLE-DIOL INTERACTION <i>Yohel Kotsuchibashi, Shizuoka Institute of Science and Technology</i></p> <p>A facile functionalization method of poly(ethylene-co-vinyl alcohol) (EVOH) nanofiber meshes was demonstrated via the benzoxaborole-diol interaction between EVOH and benzoxaborole-based copolymers.</p>	<p>5303-4 MECHANISM CONSISTENCY ANALYSIS OF COMPOSITE RUBBER IN ACCELERATED DEGRADATION TEST <i>Yashun Wang, National University of Defense Technology</i></p> <p>A likelihood ratio test method for the mechanism consistency analysis of composite rubber products in an accelerated degradation test is developed to ensure the validity of test data.</p>	<p>5305-4 DEVELOPMENT OF BEND-FORMING TECHNOLOGIES ON CFRTP TUBE <i>Tatsuya Banno, Gifu University</i></p> <p>In this research, both experiment and numerical approach has been challenged to investigate the bend-forming mechanism. Bend-forming simulation was challenged to predict defects, limits and reliability of forming.</p>	<p>5308-4 SYNTHESIS OF NEW PEPTIDES BASED IN NATURAL AND NON NATURAL AMINOACIDS POSSESSING À LA CARTE POLARITIES FOR SURFACE MODIFICATION OF NATURAL FIBERS <i>Iván Rivilla, Basque Country University</i></p> <p>In this work, we present a new route to modify basalt fibers based on the synthesis of peptides, natural and unnatural, through ring-opening polymerization process.</p>			<p>5310-4 WET-LAYUP PATCH REPAIR OF COMPOSITE STRUCTURES <i>Andrew Charles, Defence Science and Technology Group</i></p>			<p>5313-4 MODELING AND EXPERIMENTAL VALIDATION OF THE VARTM PROCESS <i>Da Wu, Chalmers University of Technology</i></p> <p>We propose a novel model to predict the thickness variation of thin-walled fiber preforms during the VARTM process. The model shows high computational efficiency and good accuracy justified by an infusion experiment.</p>	<p>5314-4 SPACE RADIATION AND HYPERVELOCITY IMPACT SHIELDING OF LOW EARTH ORBIT SPACE STRUCTURES USING ULTRA-HIGH-MOLECULAR-WEIGHT POLYETHYLENE <i>Jihun Cha, Kaist</i></p>	<p>5315-4 STRUCTURAL PREDICTION OF INJECTION MOLDED LONG FIBER REINFORCED PLASTICS BASED ON PROCESS INDUCED FIBER MICROSTRUCTURE <i>Fabian Willems, Herr</i></p>
1450-1510	<p>5301-5 ACOUSTIC RELATION BETWEEN 5-CYCLE LOAD/ UNLOAD AND FULL-CYCLE FATIGUE OF COMPOSITES WITH AND WITHOUT RESIN FLOW CHANNEL <i>Kariappa Maletira Karumbaiah, The University of Auckland</i></p> <p>The complex fatigue behaviour of composites requires the identification of the service life under cyclic loads, which involves intricate mechanical testing. Therefore, this study sought to identify a relationship between five-cycle load/ unload and full cycle fatigue performance.</p>	<p>5303-5 EXPLICIT DAMAGE MODELLING OF COMPOSITES UNDER COMPRESSIVE LOADING <i>Jie Zhi, National University of Singapore</i></p> <p>This work presents a high-fidelity integrated discrete-smearred crack approach for modelling notched composite laminates under compressive loads. The predicted failure loads and patterns compare well with experimental data and observations in the literature.</p>	<p>5305-5 HIGH PERFORMANCE/ HIGH RATE COMPOSITE PROCESSING WITH TRAPPED RUBBER <i>Brina Blinzler, Chalmers University of Technology</i></p> <p>Trapped rubber processing, an autoclave alternative to achieving high pressures during composite processing, requires an accurate thermomechanical material model for implementation.</p>	<p>5308-5 FUNCTIONALIZATION OF BASALT FIBERS BY HYDRO-THERMAL GROWTH OF ZINC OXIDE NANOSTRUCTURES <i>Matteo Lilli, Sapienza University of Rome</i></p> <p>Chemical, morphological and mechanical analysis of basalt fibres decorated with zinc oxide nanostructures through a hydrothermal process at different growth times.</p>			<p>5310-5 COMPARISON OF KISSING BOND AND DISBOND DEFECTS IN CFRP LAMINATES BY COMPRESSION AFTER IMPACT TESTING <i>Robert Pierce, University of Nottingham Ningbo China</i></p> <p>Defects have been manufactured in CFRP samples using a simple new method, and their effect on compression and CAI performance has been investigated.</p>			<p>5313-5 FINITE ELEMENT MODELLING OF BI-AXIAL FABRIC WITH CONSIDERING BENDING STIFFNESS FOR COMPOSITES PREFORMING <i>Fei Yu, Composites Research Group, University of Nottingham</i></p> <p>A macro-scale finite element model was developed by incorporating the effects of fabric bending stiffness, in order to assess its significance on the prediction of defect onset and propagation during forming.</p>	<p>5314-5 SHERLOC: INNOVATIVE MANUFACTURING AND STRUCTURAL HEALTH MONITORING OF THERMO-PLASTIC STRUCTURES <i>Jacinto Tortosa, FIDAMC</i></p>	<p>5315-5 HIERARCHICAL CARBON AEROGEL MODIFIED CARBON FIBER COMPOSITES FOR STRUCTURAL POWER APPLICATIONS <i>David Anthony, Imperial College London</i></p> <p>Multifunctional structures containing carbon aerogels contribute positively to electro-chemical double layer capacitive performance but reduce overall mechanical properties; the addition of nano-scale reinforcers (carbon nanomaterials) are proposed to address these concerns.</p>



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POSTER PROGRAM

POSTER PROGRAM

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