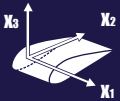


ICS Innovative Composites Summit

PARIS MARCH 11, 12, 13, 2014



6 thematic, 37 papers, 39 leading companies



SIMULATION & DESIGN



MASS PRODUCTION & ROBOTIZATION



AUTOMOTIVE



AERONAUTICS



THERMOPLASTICS



CARBON

jec magazine
COMPOSITES
OFFICIAL MEDIA SUPPORT

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KNOWLEDGE & NETWORKING



EDITO



The composite materials field's rapid expansion has made it a key component in today's industry. The important challenges are reducing the high material costs in order to maintain the benefits from energy efficiency.

The goal of our Innovative Composites Summit (I.C.S.) is to bring all the latest technologies and trends to professionals who wish to improve their knowledge of composite materials.

The conferences from the first day will focus on the designing aspect the composite industry: simulation has now become an indispensable tool that gains time and saves costs before the parts are actually created. Which leads to the generalization of mass production in major industries.

Applications will be the principal theme of the second day; and more specifically Automotive and

Aeronautics. The main challenge for these two industries is to manage the transition to mass production and design optimization as well as favor light-weighting so fuel consumption can be reduced.

Finally, key materials such as Carbon fiber and Thermoplastics will be delved upon during the third day. The specific properties of these materials and an overview of the current market will enable attendees to get detailed information about their roles in the composites world.

Thanks to its international network of professionals, industrialists and scholars were selected as speakers in order to find the best fit for our topics, offering you a unique educational platform as well as networking opportunities.

We look forward to meeting you at the I.C.S. Conferences in Paris.

The I.C.S. Team



YOUR CONTACTS



Cécile Lagoutte
Conferences/Awards Project Manager

lagoutte@jeccomposites.com
Tel.: +33 (0)1.58.36.15.79



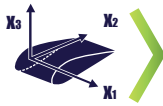
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Media Director & Editor-in-Chief

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PROGRAM SUMMARY



Tuesday 11 • Process



SIMULATION & DESIGN



- CHALLENGES AND OPPORTUNITIES OF COMPOSITES DESIGN
- NUMERICAL PREDICTIONS, CONTROL AND RESULTS

The first step towards producing parts for any given industry is the designing of products and prototypes thanks to computers and advanced software. They enable users to create the part numerically and for example determine what impacts it can sustain, which defects are most likely to develop, etc. All this information is crucial to gaining time and saving costs for future development of the concerned part.



MASS PRODUCTION & ROBOTIZATION



- AUTOMATION AND ROBOTIZATION: MAJOR FACTORS FOR MASS PRODUCTION
- PERFORMING PROCESS IMPROVEMENTS
- FILAMENT WINDING

From on-line quality control to post-machining, reworking and repair, automation is the key to mass production in the composite materials industry. The need to develop major craft parts as quickly as the industry demands has increased the need to use automated processes, such as fiber placement and tape laying.



Wednesday 12 • Application sectors



AUTOMOTIVE



- LIGHT-WEIGHTING AND COST REDUCTION
- RENEWABLE MATERIALS FOR GREENER PRODUCTS

The materials and technology that an industry chooses are very much linked to the volume of its production. In the Automotive industry, mass production is the key. New materials, designing software, automation processes and End-Of-Life recycling solutions will enable the automotive industry to use composites to their full potential.



AERONAUTICS



- INNOVATIVE DESIGNS AND STRUCTURAL CONCEPTS
- AIRCRAFT OPTIMIZATION

Composite materials have now been used for about forty years in the aeronautics industry in increasingly numerous parts such as airframes, rotor blades or fuselage, depending on their mechanical properties. Weight reduction is a major factor in the Aerospace industry as concern for the environment grows and fuel costs become ever higher; as is cost reduction.



Thursday 13 • Materials



THERMOPLASTICS



- GENERAL OVERVIEW OF THE THERMOPLASTIC MARKET
- NEW PROCESSING TECHNOLOGIES

Over the last few decades, thermoplastic composites have gained market shares and importance. Their unique properties of thermoplastic composites such as toughness and impact resistance along with recyclability and therefore environmental benefits have created a lot of new opportunities in a broad range of applications.



CARBON



- OVERVIEW OF THE CARBON FIBRE INDUSTRY
- INNOVATIVE PROCESSES
- CARBON FIBRE RECYCLING

Carbon fibers have long been specifically used in high-quality but restrained industries, due to the elevated manufacturing cost. However, their exceptional properties have made carbon fibers highly necessary in application sectors such as automotive and aeronautics. Lowering costs and enabling recycling are major challenges for this industry.

Benefits of Online Booking

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€ 125*

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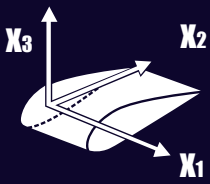
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SIMULATION & DESIGN

- ➔ CHALLENGES AND OPPORTUNITIES OF COMPOSITES DESIGN
- ➔ NUMERICAL PREDICTIONS, CONTROL AND RESULTS

10.30 AM
TUESDAY 11



CHAIRMAN

Prof. STEPHEN W. TSAI
Department of Aeronautics & Astronautics

STANFORD UNIVERSITY
USA

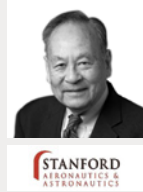


STANFORD
UNIVERSITY

1 Sijmon van der Wal
Materials Head of Department
The Netherlands

COMPOSITE AGENCY

- ➔ *CheFEM for composite service life simulation*
 - ⦿ CheFEM software allows lifetime analysis of different materials and configurations by computer simulation



4 Stephen W. Tsai
Department of Aeronautics & Astronautics
USA

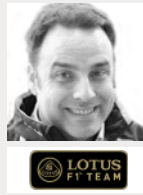
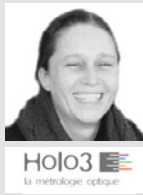
STANFORD UNIVERSITY

- ➔ *Affordable composite laminates with built-in damage and defect tolerance*
 - ⦿ Shape optimization of composite laminates
 - ⦿ Reduced layup time; open hole coupons
 - ⦿ Significant weight savings over aluminium and other metals

2 St ephanie Jaminion
R&D Engineer
France

HOLO 3

- ➔ *Better planning options with the software Correli STC*
 - ⦿ Correli STC: software dedicated to the computation, analysis and visualization of the 3D surface
 - ⦿ Driving variety of optical sensors
 - ⦿ Showing experimental results with different materials



5 Ian Goddard
Senior Engineer
United Kingdom

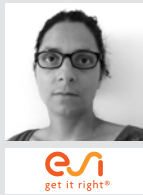
LOTUS F1 TEAM

- ➔ *New methodologies for composites design in automotive and F1 applications applied to complex F1 vehicle topology*
 - ⦿ Meeting the demands of rapid automotive cycle times
 - ⦿ Multi-ply based design approach
 - ⦿ Empowering manufacturing team

3 Mathilde Chabin
Composites business development
and product marketing manager
France

ESI GROUP

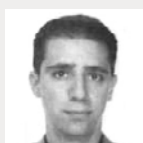
- ➔ *Prediction of manufacturing - induced composite distortions*
 - ⦿ Approach for simulating various composites manufacturing processes
 - ⦿ Control of distortions
 - ⦿ Computational techniques to predict shape distortions of composites parts



6 Sung Ha
Professor
South Korea

HANYANG UNIVERSITY

- ➔ *Design of Composite Structures considering fatigue induced damages*
 - ⦿ Fatigue life prediction based on multi-scale approaches
 - ⦿ Mechanical and thermal loads
 - ⦿ Applications to wind turbine blades, off-shore pipes and pressure vessel
 - ⦿ Free download of fatigue design tools



Fr ed eric Sicard
Composite & lightweight innovation leader
David Figoli
BIW Crash and acoustics calculation specialist
France

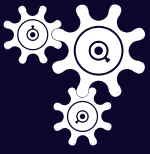


7 PSA PEUGEOT CITRO EN

Design approach of an automotive structural part made with thermoplastic composite: door side impact beam

- ⦿ PSA and DuPont established collaborative project
- ⦿ New thermoplastic composite material
- ⦿ Weight saving of 45 % and numerical prediction of composite parts distortion





MASS PRODUCTION & ROBOTIZATION

- ➔ AUTOMATION AND ROBOTIZATION: MAJOR FACTORS FOR MASS PRODUCTION
- ➔ PREFORMING PROCESS IMPROVEMENTS
- ➔ FILAMENT WINDING



2.30 PM

TUESDAY 11



CHAIRMAN

OTTO KELLENBERGER
Key technology manager

KUKA-ROBOTICS
Germany



KUKA

1 Otto Kellenberger

Key Industries - Key Technology Management,
Aerospace and Composite Application
Germany



KUKA ROBOTICS

- ➔ Overview on current trends and state-of-the-art in mass production and robotization as an introduction to the session



4 Gustavo Lasiera Ferrer

Project Manager
Spain



EINA

- ➔ Automated surface preparation of composites and other robotic applications
 - ⦿ New technology makes possible new automations
 - ⦿ After mould processes can already be automated
 - ⦿ Robots with sense of touch.

2 Benoit Courtemanche

R&D Engineer
France



CETIM

- ➔ Composites thermoplastic structural parts manufactured by laser assisted filament winding
 - ⦿ Laser assisted filament winding of the thermoplastic composites
 - ⦿ Pressure vessel applications
 - ⦿ Reach material throughput rates of about 1 kg/minute.



5 Dipl.-Ing. Sven Blümel

Production and Systems Department
Germany



LASER ZENTRUM HANNOVER E.V.

- ➔ 3D high power laser processing of CFRP lightweight structures for the automated automobile production
 - ⦿ HolQueST 3D project: 7 partners from industry and science working together
 - ⦿ Develop a process for 3D high-performance laser processing of CFRP lightweight structures
 - ⦿ Optimized process monitoring system.

3 Michael Kühnel

Alfons Schuster
R&D Engineer
Germany



DLR - GERMAN AEROSPACE CENTER

- ➔ Automated near-net-shape preforming of carbon fiber reinforced thermoplastics
 - ⦿ Preforming process can be improved when using several technologies
 - ⦿ Automated cut-piece detection, robotic gripping and lay-down of fabrics.



6 Michel Cognet

Managing Director
France



CHOMARAT

- ➔ How C-Ply™ and Steve Tsai vision can change the way we design and manufacture

KUKA





AUTOMOTIVE

- ➔ LIGHT-WEIGHTING AND COST REDUCTION
- ➔ RENEWABLE MATERIALS FOR GREENER PRODUCTS



10.30 AM

WEDNESDAY 12



CHAIRMAN

DR. CHRIS SHENNAN
Research & Technology Manager

HEXCEL COMPOSITES LTD.
United Kingdom



1

Prof. Toshihiro Hirai

President of the society of Fiber Science and Technology
Japan



**FACULTY OF TEXTILES
SCIENCE AND TECHNOLOGY**

- ➔ *New possibility of textile polymers for electro-active materials*
 - ⦿ Development of new devices
 - ⦿ Suggestion of new textile polymers for gels, elastomers, solid films and fibers
 - ⦿ Function changing with very low energy loss



Valérie Marcel

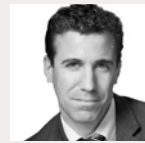
Innovation project leader
Frédéric Rousseau
R&D Engineer
France

4

**FAURECIA
PSA PEUGEOT CITROËN**

Vision of the automotive industry: The process development of semi-finished products of innovative green composite materials

- ⦿ Project Flexpreg developed together with Faurecia, Linea, University of Reims
- ⦿ Major target: Weight reduction, use of renewable materials



2

Dr. Chris Shennan

Research and Technology Manager
United Kingdom



HEXCEL COMPOSITES LTD.

- ➔ *Snap cure materials for high volume production of automotive parts*
 - ⦿ New class of M77 HexMC «snap cure» preregs



Stephan Costantino

Technical support applications
& Process team leader
Switzerland

5

HUNTSMAN ADVANCED MATERIALS

- ➔ *Fast and cost efficient solution for automotive mass production*
 - ⦿ High pressure RTM using recent epoxy system developed by Huntsman
 - ⦿ Requirements, advantages and limitations of compression molding for fast production

3

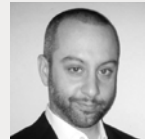
Patrick P.C. Muezers

Managing Director
The Netherlands



POLYSCOPE POLYMERS

- ➔ *Integrated semi-convertible sunroof system in glass-reinforced SMA/ABS resin*
 - ⦿ Very-large thermoplastic sunroof module for a serial vehicle
 - ⦿ Reduce weight and optimize systems cost.
 - ⦿ Development process, tooling considerations, and benefits vs. other materials



Andrea Aguggiaro

R&D Engineer
Juan Pablo Gallo Jaramillo
R&D Engineer

6

Christian Lair
Expert Sales Product Representative, CATIA
Composites EMEA
Italy / Colombia / France

LAMBORGHINI / DASSAULT SYSTEMES

- ➔ *Challenges developing composite carbon fiber cars*
 - ⦿ Most efficient solution for Carbon Fiber parts development





AERONAUTICS

- ➔ INNOVATIVE DESIGNS AND STRUCTURAL CONCEPTS
- ➔ AIRCRAFT OPTIMIZATION



2.30 PM

WEDNESDAY 12



CHAIRMAN

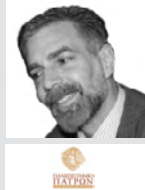
DR. MATTHEW BEAUMONT
Global Research

GENERAL ELECTRICS
Germany



1

Vassilis Kostopoulos
R&D Head of Department/Director
Greece



UNIVERSITY OF PATRAS

- ➔ *Efficient use of composites through novel design paradigms for lightweight structures: case studies in aeronautics*
 - ⦿ Two case studies of all composite near future fuselage structures
 - ⦿ Identification of damage modes



Dr. Sebastiaan Veldman
Project Manager
The Netherlands



ATKINS

- ➔ *Lean engineering approach for analysis of aerospace composite structures*
 - ⦿ Strategy for panel laminate optimization with respect to buckling
 - ⦿ Optimization strategy for damage tolerance of stiffened panels

4

2

Prof. François Trochu
Professor
Canada



ECOLE POLYTECHNIQUE DE MONTRÉAL

- ➔ *Process optimisation of aircraft composites fabricated by liquid composite molding*
 - ⦿ Resin Transfer Moulding (RTM), resin cure, void content, saturation, process simulation and optimisation



Plamen Roglev
Design Director
Bulgaria



PERUN TM EOOD

- ➔ *Development of a composite structure for a box-wing type aircraft*
 - ⦿ different variants studied with numerical simulations and physical tests
 - ⦿ Multidisciplinary optimization with in-house methodology employing metamodels and adaptive sampling techniques

5

3

Leigh Hudson
Fibersim Product Manager
USA



SIEMENS PLM SOFTWARE

- ➔ *Removing hidden inefficiencies in the aerospace composite development process*
 - ⦿ New capabilities to faster design composite parts
 - ⦿ Create on-target designs with less chance for error



Nicolas Guerin
R&D Aerospace & Defense Industry
Senior Manager
France



DASSAULT SYSTEMES

- ➔ *Fast development and right-first time validation of a highly-optimised composite fuselage «MAAXIMUS Consortium»*
 - ⦿ Highly optimized composite fuselage
 - ⦿ 50 % reduction of assembly time
 - ⦿ 57 international partners bringing in their expertise

6



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THERMOPLASTICS

- ➔ GENERAL OVERVIEW OF THE THERMOPLASTIC MARKET
- ➔ NEW PROCESSING TECHNOLOGIES



10.30 AM
THURSDAY 13



CHAIRMEN

PROF. KLAUS DRECHSLER
TU MÜNCHEN
PROF. PETER MIDDENDORF
IFB STUTTGART

Germany



Universität Stuttgart

Official Partner

1

Dr. Lena Josch
Teacher & Academic
Germany



UNIVERSITY OF KAISERSLAUTERN

- ➔ *Anisotropic tribological properties of PEEK/Carbonfibre composites*
 - ⦿ Comparison of PEEK compounds with and without nan-reinforcement
 - ⦿ Better overall performance of nanoreinforced samples
 - ⦿ Tribological testing results of injection moulded PEEK composites.



Klaus Gleich
Senior Research Associate
USA

JOHNS MANVILLE

- ➔ *Structural thermoplastic composites - the view of a glass fiber producer*
 - ⦿ Requirements and optimizations of the reinforcing glass fiber
 - ⦿ How to obtain a best possible mix of properties and performance in the various manufacturing processes

4

2

Dr. Elizabeth Cates
Vice President Research & Development
USA



INNEGRA TECHNOLOGIES

- ➔ *Hybrid Reinforcement Yarns for Impact-Resistant Composite Structures*
 - ⦿ Innegra S fiber increases impact of performance of a laminate up to 40 % and 50 % the density of carbon fiber
 - ⦿ New Innegra H yarns bring together impact performance with mechanical properties of other high performance materials, such as carbon, glass, basalt and aramid.



Frank Meurs
Group Director EMEA
The Netherlands

TENCATE ADVANCED COMPOSITES

- ➔ *Challenges in the commercialization of thermoplastic composites - chain integration in the innovation phase*
 - ⦿ Close cooperation with value chain partners is required
 - ⦿ Integration of functionalities
 - ⦿ Cost efficient materials and processes

5

3

Andreas Erber
Senior Manager Projects
Simon Spitko
Manager Product and Technology Management
Germany



SGL CARBON

- ➔ *Customized sizing solutions for carbon fiber reinforced polymers*
 - ⦿ Requirements on surface and sizing technologies
 - ⦿ Development and application of a portfolio of thermoplastic semi-finished materials



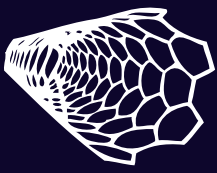
Alan Wood
Technical Sales Manager
United Kingdom

VICTREX

- ➔ *Thermoplastic - matrix composites - the myths, the barriers to use and the solutions*
 - ⦿ Thermoplastic-Matrix Composites
 - ⦿ Hybrid moulding technologies
 - ⦿ Material properties
 - ⦿ New processing technologies.

6





CARBON

- ➔ OVERVIEW OF THE CARBON FIBRE INDUSTRY
- ➔ INNOVATIVE PROCESSES
- ➔ CARBON FIBRE RECYCLING



2.30 PM

THURSDAY 13



CHAIRMAN

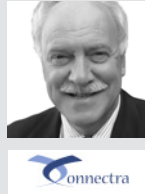
ANDREW MAFELD
Managing Director Connectra Global KB

CONNECTRA
Sweden



1

Andrew Mafeld
Managing Director Connectra Global KB
Sweden



Dr. Guido Streukens
Project Manager
Germany

4

CONNECTRA GLOBAL KB

EVONIK INDUSTRIES AG

- ➔ *Recent developments in carbon fibre prepregs and tapes across major end uses*
 - ⦿ Faster cycle times
 - ⦿ Out-of-autoclave processing and automated manufacturing processes.

- ➔ *Polyurethane prepregs - a new matrix system for fibre reinforced plastics*
 - ⦿ Prepreg material based on polyurethane matrix materials
 - ⦿ High grade of automatization at processing; short cycle times
 - ⦿ Higher ductility than comparable epoxy systems
 - ⦿ Outstanding mechanical characteristics

2

Inma Roig
R&D Technician
Spain



Marian Körber
R&D Engineer
Germany

5

AIMPLAS

DLR - GERMAN AEROSPACE CENTER

- ➔ *Microwave processing monitoring of carbon reinforced composites using fiber bragg gratings*
 - ⦿ Microwave curing technology
 - ⦿ Monitoring of carbon reinforced composites
 - ⦿ Fiber Bragg gratings.

- ➔ *Automated tool for depositing and draping of dry carbon fabric cuttings in a double curved mould*
 - ⦿ Handling and accuracy of the deposition process of semi-finished carbon products
 - ⦿ Automated Deformation and draping of carbon fibre tissues
 - ⦿ Realization of automated drapery with a mechanical approach

3

Leung Tang
Developer
United Kingdom



Tristan Tiedt
Research Assistant
Germany

6

AGILENT TECHNOLOGIES

RWTH AACHEN UNIVERSITY

- ➔ *Hand-Held FTIR NDT evaluation of plasma cleaning of CFRP composites*
 - ⦿ FTIR method to ascertain degree of plasma cleaning
 - ⦿ Analysis is performed portably, hand-held and non-destructively.

- ➔ *Innovative recycling processes for carbon fibre reinforced composites*
 - ⦿ Innovative recycling processes
 - ⦿ Carbon fibre reinforced composites
 - ⦿ New multi-material mix
 - ⦿ Efficient recycling of fibre waste

