

About this workshop

Interest in composites has grown greatly over the past decade. Their unique properties (high strength to weight ratio, corrosion resistance etc.) offer increasingly important advantages in manufacturing but they can present a major challenge to cutting, drilling and other manufacturing processes.

Lasers offer a unique solution to the processing of composites. This is widely recognised, especially within the aerospace materials processing sector. As a result, lasers are finding a growing number of industrial applications; and developments in both laser and material technologies have recently led to a further expansion in this area.

This workshop provides a broad overview of the current status of both laser technology and composite processing, with presentations from industrial users, researchers and laser manufacturers. Specific themes include: laser processing of polymer composites within the aerospace industry; laser surface texturing of composites prior to adhesive bonding, laser sintering of PEEK for aerospace and biomedical applications; laser welding of thermoplastics; current state-of-the-art in lasers for composite processing.

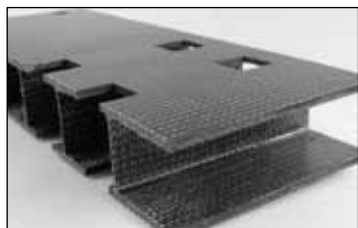
Paul French Workshop Chair



Paul French completed his PhD in laser material processing from the University of Liverpool in 2001 and moved to the Lairds Laser Engineering Centre. In 2008 he and Martin Sharp set up the Photonics in Engineering (PIE) research group within the General Engineering Research Institute (GERI) at Liverpool John Moores University. Paul continues to work on applications in industry including the aerospace, automotive, defence and biomedical sectors. The laser material processing of composites is of special interest.

Who should attend?

This workshop will be valuable to anyone with an interest in laser material processing and especially to those who want to understand where laser technology sits in relation to composite materials.



Courtesy of Fraunhofer ISW

The wide scope of this event means that there is something for everyone in the laser user and supplier community, from beginners to experts. Manufacturers and industrialists, supply companies, laser users, laser source manufacturers and suppliers, laser-based engineering subcontractors and machine integrators. All will gain from a greater appreciation of the current state of play; the resultant opportunities recent developments present; and insight into the future development of a laser-composite supply chain within the UK. The workshop nature of the meeting offers many networking opportunities.

Networking Opportunities

A key feature of AILU workshops are the opportunities they provide for networking and for discussing technical matters: a comfortable environment, generous lunch and refreshment breaks, and a small exhibition and a tour of the National Composites Centre. Delegates will be able to ask questions after presentations; and in general make contact, establish valuable links and share interests and concerns with others in the laser composite-processing community.

About this workshop

Venue

The workshop is being held in the National Composite Centre Bristol, one of the seven centres that form the UK High Value Manufacturing Catapult.

The Centre is located in the Bristol and Bath Science Park close to the intersection of the M4 and M32 motorways.



Delegates

On the day delegates will receive a name badge, a list of delegates, essential notes for the day and a password for accessing the key presentation slides, which will be made available on the AILU website shortly after the end of the event. A buffet lunch (including vegetarian options) will also be provided together with refreshments throughout the day. Please advise us of any special dietary requirements.

PLEASE NOTE: Delegates are required to register by **18 September** latest and to **bring photographic identification with them on the day.** Also, for reasons of industrial confidentiality the NCC reserves the right to exclude delegates from certain organisations from the whole or parts of the tour that immediately follows the presentation programme.

Exhibitors

The exhibition, together with lunch and mid-morning and afternoon refreshment breaks, will take place at the back of the meeting room. There is a limited number of exhibition tables available. Exhibitors should make sure that their stands are set up before the start of presentations (09:10). Access to the building is from 07:00.

Tables (160 x 80cm) will be provided together with space for pop-up stands, there is limited mains power for low wattage use (e.g. computer displays) so please let us know as soon as possible if you require power.

Registration

Delegates and exhibitors who are **AILU members** need only **phone or email** their names; otherwise a registration form should be completed.

AILU members and members of the National Composites Centre receive a registration discount. Delegates who pay the full price and who decide to join the Association within 10 weeks of the event will receive this discount on their first year's corporate membership subscription. Full information about membership can be found at www.ailu.org.uk, taking the 'about us' link.

Travel

Full address: Bristol & Bath Science Park, Emersons Green, Bristol, South Gloucestershire BS16 7FS

NB: As a new road and postcode, the NCC may not appear on your map or satnav. If you are using GoogleMaps or SatNav, please use postcode BS16 7AJ to get to the roundabout at the entrance to the Bristol & Bath Science Park, before following the road around rightwards, up Feynman Way, to the National Composites Centre.



Courtesy of OpenStreetMap

Accommodation

Details of accommodation with links to the various hotels and full descriptions can be found on the AILU website page for this event.

Courtesy of Laser Zentrum Hannover

Role of lasers in composite manufacture and processing

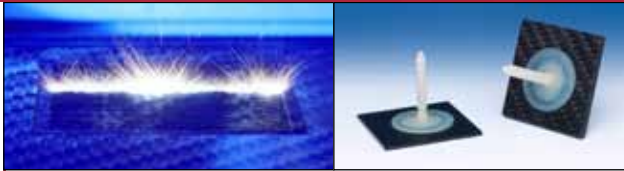
Presentations, exhibition, tour of the NCC

Tuesday 24th September 2013
National Composites Centre, Bristol

Supported by:



Programme



Courtesy Laser Zentrum Hannover

08:15 - 09:10 Registration and refreshments

09:10 - 10:30 **Session 1**

Welcome

Paul French Liverpool John Moores University

Introduction to NCC Agnieszka Chorley

Keynote presentation

Laser transmission welding of high-performance thermoplastics

Peter Jaeschke Laser Zentrum Hannover

Fibre laser processing of reinforced plastics

Mo Naeem JK Lasers

10:30 - 11:00 Refreshment break



Courtesy Liverpool John Moores University

Composites processed by lasers

11:00 - 11:50 **Session 2**

Keynote presentation

CO₂ laser ablation of damaged CFRP: A GKN Perspective

Paul Saunders GKN

Precision machining of composite materials with picosecond lasers

Mark Thompson Coherent

11:50 - 12:50 Lunch & EXHIBITION

12:50 - 14:00 **Session 3**

Keynote presentation

Remote laser processing of fibre reinforced polymers - perspectives for the industrial use

Annett Klotzbach Fraunhofer IWS, Dresden

Process rate and quality estimation tools for laser processing of fibre reinforced polymers

Stewart Williams Cranfield University

Lasers in Composites Aerospace Industry

Gary Taylor GÜDEL

14:00 - 14:20 Refreshment break

Programme



Courtesy of Coherent

Talisker 500 Pico-second laser

14:55 - 15:55 **Session 4**

High temperature polymer development on the EOSINT P800

Stuart Jackson EOS

Particulate and gas phase fume produced during laser processing of CFRP

Matthew Leach University of Hull

A study of the effect of laser surface processing on bond adhesion for carbon fibre composites

Peter Dickinson Spectrum Technologies

15:20 End of workshop

15:20 - 16:05 **Tour: National Composites Centre**

TOUR: National Composites Centre, Bristol



An autoclave with the door open

Courtesy NCC

The National Composites Centre brings together dynamic companies and enterprising academics to develop new technologies for the design and rapid manufacture of high-quality composite products. The NCC was established with a £25m investment from the European Regional Development Fund, the South West Regional Development Agency and the Department of Business, Innovation and Skills. Currently underway is a £28m project to double the size of the centre to enhance our ability to include skills, training and further development opportunities for UK Composites Industry Companies and should be completed by 2014. The 45 minute tour will take in some of the following:

Extensive 3D CAD Design and analysis capabilities;

Tri-Robot Flexible Manufacturing Cell (under construction); a fully flexible cell for composite ply deposition, pick and place, trimming, ablation, fixture manipulation and end effector development;

A robotised automated fibre placement cell working to optimise parameters for placement of multiple fibres; (Access restricted)

Metalworking and composites machining workshop;

Liquid Resin Cell and Autoclaves;

Dry Forming Cell;

Pre-impregnated materials facilities;

Materials Laboratory.

Non Destructive Testing facilities



Clean room with Automated fibre placement (AFP) units

Courtesy NCC

Registration

Lasers in composite processing

24th September 2013

Name:

Title & initials First name Surname

Job title:

Organisation:

Address:

Post Code:

Tel: Fax:

E-mail:

Nationality: (venue requirement).

Payment options

Please invoice me

I wish to pay in advance by:

1. Bank/Euro cheque in £ Sterling or EURO, payable to AILU

2. Visa/Mastercard (billing in GBP):

Name on Card

Number _ _ _ _ _ Exp _ / _

Please debit my account

Delegate/exhibitor options

I wish to register as a delegate. The applicable rate is:

£140.00 (= £168.00 incl. VAT)

I am a member of AILU and/or one of the supporting organisations:

NCC National Composites Centre

£60.00 (= £72.00 incl. VAT)

I am unemployed or retired.

£40.00 (= £ 48.00 incl. VAT)

I am a full time student.

£180.00 (= £216.00 incl. VAT)

I wish to register as an exhibitor. Please reserve me:

Space only A table

The applicable rate is:

GBP 140.00 (= £168.00 incl. VAT)

I am a member of AILU or one of the supporting organisations ticked above.

GBP 180.00 (= £216.00 incl. VAT)

I wish to register as a delegate and exhibitor.

Please give me a £50 plus VAT discount on the total fee.

Signed: Date:

Cancellations will be accepted up to 1 week before the event; otherwise the full fee may be charged.

Please return completed form to the AILU office by FAX (+44 (0)1235 550499) or mail to AILU, 100 Ock Street, Abingdon, Oxon OX14 5DH, UK

Deadline for registration 18 September 2013

Photo ID is obligatory on the day This is a venue requirement