

Dramatic advances in photonics technology mean that today's industrial laser systems offer unparalleled capabilities in precision manufacturing and advanced materials processing at the micro and nano scale, thereby providing the flexibility and accuracy required to manufacture the products of tomorrow. Moreover, laser materials processing is a key technology for the mass-production of many components ranging from photovoltaic cells and panels, inkjet print heads and flat panel displays, to MEMS components and circuit fabrication and rapid developments in laser materials processing are continually yielding new applications and processes. User industries from general engineering through to solar, electronics, semiconductor and medical – all benefit from the precision and power of the laser.

Ongoing miniaturisation continues to push manufacturing technology to its limits, and continued developments of lasers and materials processing applications is providing the means to produce ever smaller increasingly accurate and more cost effective micro and nano-features. Staying abreast of these developments is key to maintaining a competitive edge.

This annual workshop seeks to bring together industrial users of laser processing technology, suppliers of laser-based equipment, researchers in new laser technology and industrialists to review the latest innovations in micro and nano-scale laser processing and the opportunities that they create. This year's event is held for the first time at the Centre for Industrial Photonics at the Institute for Manufacturing, Cambridge University and includes a tour of the state-of-the-art work going on there.

**Bill O'Neill** Workshop Chair



**Bill O'Neill** is a Reader in Laser Engineering within the Cambridge University Engineering Department and Director of the Centre of Industrial Photonics. His research interests cover a wide range of laser applications across the length scales, including laser based manufacturing technologies, and micro/nano fabrication techniques.

**Tour**

The workshop will include a tour of the laser facilities at the Centre for Industrial Photonics. CIP is at the forefront in developing leading-edge technologies and transforming them into commercially viable processes for industry.

The tour will provide a chance to see the new supersonic laser deposition laboratory, the micro laser processing laboratory (including the digital holography facility for laser plasma diagnostics), the macro processing laser facility and the nano-manufacturing facility.



**Who should attend?**

One of the key features of an AILU workshop is the opportunity it provides for delegates to meet with the presenters and with one another: a comfortable environment, generous lunch and refreshment breaks, and a table top exhibition. This particular event provides an opportunity to keep up to date with the latest developments in laser micro-manufacturing and to visit state-of-the-art facilities. Whether an expert or novice, an engineer, research scientist or a manufacturing manager, it presents a valuable learning and networking opportunity and a chance to generate new ideas and valuable contacts.



**Jack Gabzdyl**  
Line Manager for ns pulsed fibre lasers  
SPI Laser,  
Southampton, UK



**Chris Bower**  
Principal researcher in materials science  
Nokia Research Centre,  
Cambridge UK



**Stephan Geiger**  
Managing Director  
Rofin - Baasel Lasertech,  
Starnberg Germany



**Vincent Rouffiange**  
Sales and Marketing Manager  
Amplitude Systemes,  
Pessac France



**Bob Hainsey**  
Senior Director of Research and Development  
Electro Scientific Industries Huntingdon UK



**Andrew Kearsley**  
R&D Director  
Oxford Lasers,  
Didcot UK



**Rahul Kuchimanchi**  
Laser Technology Manager  
Gravutex Eschmann International,  
Glossop UK



**Jose Ramos**  
Technology Strategy Manager  
Asociacion Industrial de Optica (AIDO)  
Valencia Spain



**Paul French**  
Senior Lecturer  
Liverpool John Moores University, UK



**Marcus Ardron**  
Senior Design Engineer  
Heriot-Watt University  
Edinburgh and  
Renishaw plc,  
Edinburgh



**Ian Jones**  
Project Leader,  
Polymer Section  
TWI,  
Cambridge UK



**Krste Pangovski**  
Researcher  
Cambridge University, UK



Courtesy of Rofin-Baasel



**Ultra precision laser manufacturing systems, technologies and applications**

> **Presentations**

> **Exhibition**

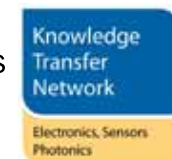
> **Tour of the Centre for Innovative Photonics**

**Tuesday 13 September 2011**

**Institute for Manufacturing, Cambridge**

**Supported by:**

**IOP Institute of Physics**



**PROGRAMME**

**09:00 - 09:30 Registration**  
**09:30 - 11:00 Presentations 1**  
**Introduction to the Micro: Nano Special Interest Group**  
 Jack Gabzdyl SPI Limited, UK

**Keynote presentation**  
**Current and future manufacturing challenges for mobile devices**  
 Chris Bower Nokia Research Centre, UK

**Materials processing with ultra-short pulsed lasers**  
 Stephan Geiger Rofin-Baasel Lasertech GmbH, Germany

**Advanced micro and nano-processing application of industrial ultra-fast lasers**  
 Vincent Rouffiange Amplitude Systemes, France

**11:00 - 11:30 Refreshment break and EXHIBITION**

**11:30 - 13:00 Presentations 2**  
**Keynote presentation**  
**Laser systems and micro-machining applications in the electronics industry**  
 Bob Hainsey ESI, UK

**Short pulsed laser micro-machining**  
 Andrew Kearsley Oxford Lasers, UK

**Application of 5-axis laser engraving system for functional texturing 3D surfaces**  
 Rahul Kuchimanchi Gravutex Eschmann International Ltd, UK

**High precision production technologies for high quality 3D micro-parts**  
 Jose Ramos AIDO, Instituto Tecnológico de Óptica, Spain

**13:00 - 14:00 Lunch and EXHIBITION**

**14:00 - 15:00 Presentations 3**  
**Fibre Laser processing of metallic and polymer substrates for cell control for medical implant and defence applications**  
 Paul French Liverpool John Moores University, UK

**Sub-micron surface structuring for encoder manufacture by a laser melting process**  
 Duncan Hand & Marcus Ardron Heriot-Watt University, UK

**Short pulse laser processing of surfaces and thin films - a game of speed and intensity**  
 Ian Jones TWI, UK

**Laser interaction characteristics using 1ns Yb fibre lasers**  
 Krste Pangovski IFM, Cambridge University, UK

**15:00 - 15:30 Refreshment break**  
**15:30 - 16:30 IFM laboratory tours**  
**16:30 Close**

**About this workshop**

**Venue**  
 The workshop will be held in the Institute for Manufacturing in The Alan Reece building - Cambridge University West Site



**Delegates**  
 Delegates and exhibitors should enter the Alan Reece building by the main entrance, from where the meeting room and exhibition area will be signposted. At the registration desk delegates will receive a pack containing a name badge and essential notes for the day, including a detailed programme and a delegate list. The pack will also include a name and password for downloading PDFs of the presentations, which will be made available on the AILU web site as soon as possible after the event.

A buffet lunch (including vegetarian options) will be provided together with refreshments throughout the day. Please advise us of any special dietary needs.

**Exhibitors**  
 The exhibition, together with the lunch and refreshment breaks, will take place in an area adjacent to the lecture theatre. Tables and velcro compatible backboards will be provided, together with mains extension leads.

Access to the exhibition area for set-up is available from 07:30 on the day through the main entrance of the Alan Reece building. Loading and unloading of large items can be made via a side entrance.

**Registration**  
 To register for the event please complete the registration form opposite or (NEW!) register online at [www.regonline.co.uk/13Sep11AILU](http://www.regonline.co.uk/13Sep11AILU). Alternatively, members of AILU and/or the Micro:Nano Special Interest Group need only give their name by phone or email (T: 01235 539595; E: [courses@ailu.org.uk](mailto:courses@ailu.org.uk)).

AILU members and members of supporting organisations for this event 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. Further information on membership can be found at [www.ailu.org.uk](http://www.ailu.org.uk) by taking the 'about us' link.

**Clinic**  
 AILU staff will be available throughout the day to arrange informal introductions with appropriate experts at the workshop, for discussions on any technical or business matters that delegates would like to raise.

**Travel**  
 Full address: Institute for Manufacturing, Alan Reece Building, 17 Charles Babbage Road, Cambridge, CB3 0FS

**Air:** London Stansted is the nearest international airport to Cambridge, located 30 miles to the South of the city, with easy access by train (direct rail link to Cambridge), coach, or car (M11).

**Rail:** The venue is a 10 minute taxi drive from Cambridge railway station.

**Car:** The closest motorway junction is Jn 13 of the M11. For full directions by road see the event page on the AILU web site.

There is free parking in the IfM car park adjacent to the Alan Reece building. Should it be full, please use the Madingly Road Park and Ride car park about 10 minutes walk away.

**Accommodation**  
 Details of accommodation with links to sites with full descriptions can be found on the AILU web site page for this event. These include the Cambridge University Campus, the nearest hotel (the Premier Inn Cambridge North (Girton), which is 1 mile away), the Travelodge Cambridge in Lolworth and plenty of bed and breakfast and hotel accommodation in and around the city.

**Registration**

**Ultra precision laser manufacturing 13 September 2011**

Name: .....  
Title & initials First name Surname

Position: .....

Organisation: .....

Address: .....

.....

Post Code: .....

Tel: ..... Fax: .....

E-mail: .....

**Payment options**

- Please invoice me
- I wish to pay in advance by:
  1. Bank/Euro cheque in £ Sterling, 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:
    - GBP 155.00 (= £186.00 incl. VAT)
    - I am a member of AILU and/or one of the supporting organisations:
      - ESP KTN  Nanotechnology KTN  Institute of Physics
    - GBP 70.00 incl. VAT  GBP 45.00 incl. VAT
    - I am unemployed or retired. I am a full time student.
    - GBP 195.00 (= £234:00 incl. VAT)
  - I wish to register as an exhibitor. Please reserve me:
    - Space only  A table and backboard
- The applicable rate is:
- GBP 155.00 (= £186.00 incl. VAT)
  - I am a member of AILU or one the supporting organisations ticked above.
  - GBP 195.00 (= £234:00 incl. VAT)
- I have registered above as both a delegate and an 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**