



Innovations in Large-Area Electronics Conference

22 - 25 February 2021
Online

Printable, flexible, plastic, organic & bio-electronics
Researchers Manufacturers Integrators Users

The 7th annual Innovations in Large-Area Electronics Conference (innoLAE 2021) will be held online on 22-25 February 2021, using an online event platform.

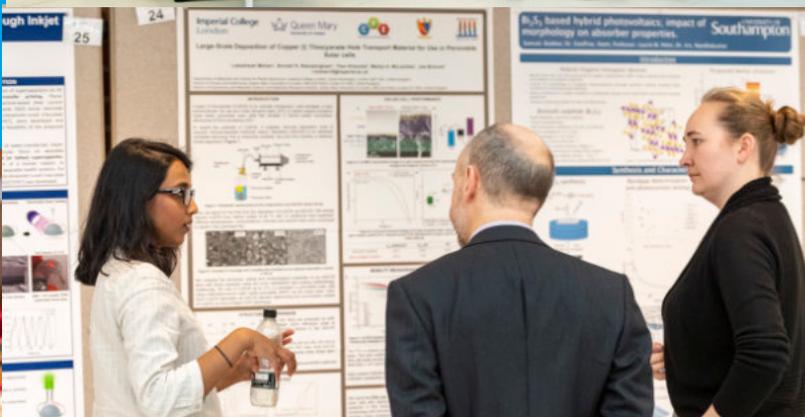
The conference focuses on new ways to make electronics, leveraging novel processes and new functional materials to provide electronic functionality in thin, flexible and transparent designs.

Dates

22-25 February 2021

Venue

Online



About the Conference



The 7th annual Innovations in Large-Area Electronics Conference (InnoLAE 2021) and supporting events will be held online on 22-25 February 2021. The two-day conference programme (24-25 February highlights the latest developments in large-area electronics (LAE) is a new way of making electronics including advances in materials, devices, systems, manufacturing processes and enablers such as encapsulation and barriers and hybrid integration of LAE with silicon electronics. Applications including lighting, energy harvesting and flexible photovoltaics, flexible and printed displays, sensors, integrated smart systems, e-textiles and bioelectronics are covered.

InnoLAE attracts researchers, manufacturers, suppliers, integrators and users to explore this emerging technology and the development of products incorporating LAE. By attracting equal and growing interest from industry and academia, the InnoLAE conference provides a unique and important platform for supporting innovation, building collaborations, knowledge sharing and, ultimately, promoting the growth of the field and advancing the state-of-the-art.

The conference delivers a high-calibre programme of parallel and plenary talks, hosts internationally-renowned keynote speakers, poster presentations, an exhibition showcasing leading companies' latest developments and facilitates networking opportunities.

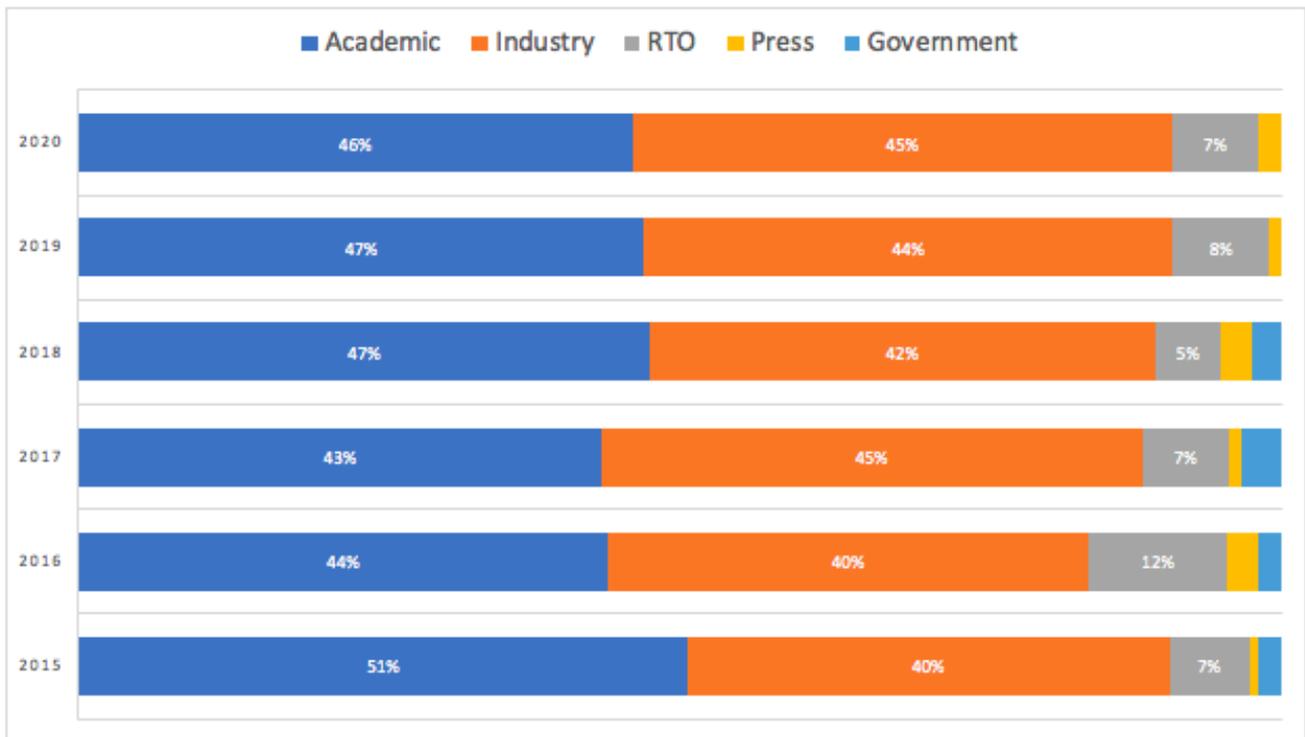
Having established itself as a key event for the LAE community, we look forward to InnoLAE 2021 once again playing host to researchers from all over the world as they present the view from SMEs and large global companies, leading manufacturers and end-users, research and technology organisations and academia.



InnoLAE conference at a glance

The innoLAE conference is designed to facilitate knowledge sharing between industry and academia to encourage collaboration, support innovation and, ultimately promote the growth of the field and advance the state-of-the-art.

Over six years the innoLAE conference has grown steadily to become recognised as 'the premier UK event'. The conference managed to attract equal and growing interest from both industry and academia - researchers, manufacturers, integrators and users. Since 2015, the conference and preceding industry day, received registrations from 866 unique delegates representing 322 institutions across 27 countries.



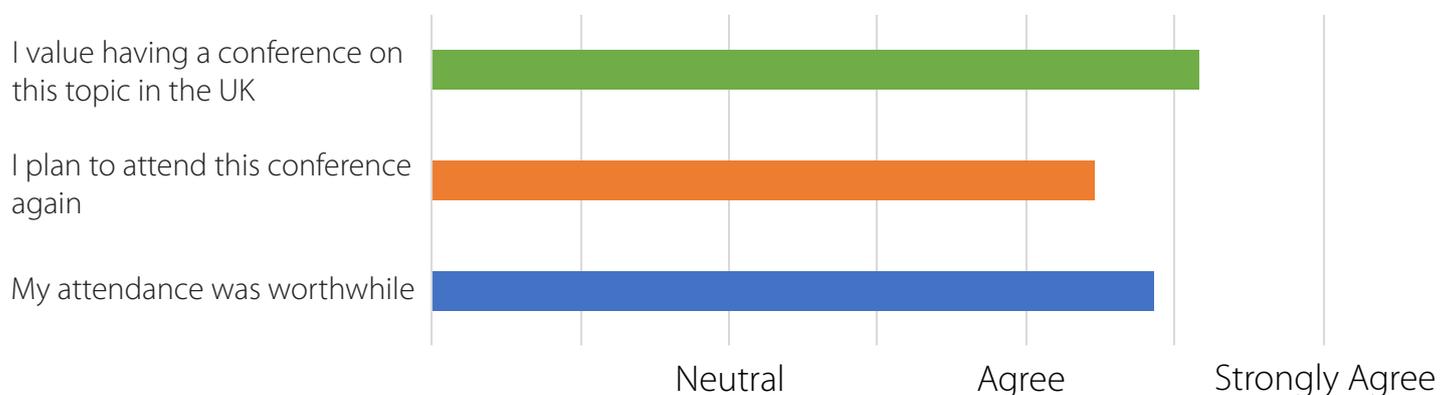
During this period of growth, the conference was able to maintain the unique academia: industry balance which makes it such a productive space. Many attendees list this mix of speakers and delegates as the most valuable and distinctive characteristic of the conference.



InnoLAE delegate feedback

Feedback from innoLAE delegates across the past 5 years highlights their appreciation for the calibre and coverage of the conference programme as well as the balance between academic and industry delegates. innoLAE 2020 was no exception.

99% of delegates agreed that their participation in the conference was worthwhile.



"There is a wide breadth of technical talks covering all aspects of LAE"

innoLAE 2020 exhibitor

"The quality of the invited speakers has been amazing"

innoLAE 2019 delegate

"I think the mix of speakers and exhibitors is great - it really supports the principles of innovation. The conference showed clear evidence of fascinating advances in the field and the roadmap from 'blue sky' and lab research to the all-important route to manufacturing and the supply chain."

innoLAE 2017 delegate



InnoLAE 2020 Attendees

| | |
|---|--|
| A-Gas Electronic Materials | Meteor Inkjet |
| Aixtron | M-Solv |
| Alphasense | National Physical Laboratory |
| ARM | NeuDrive |
| Asahi Kasei | Nottingham Trent University |
| BAE Systems | NovaCentrix |
| Beko R&D Centre | NxSteps |
| BiologIC Technologies | Optomec |
| Bodle Technologies | Oxford Lasers |
| Cambridge Consultants | Paragraf |
| Cambridge Display Technology | Pattern Ltd/LOPEC |
| Centre for Process Innovation | Peratech |
| CHASM Advanced Materials | Pilkington |
| Coatema | Plasma Quest |
| COMSOL | PragmatIC |
| Coventry University | Printed Electronics Ltd |
| Curling Consulting | Printed Electronics Now (PEN) |
| db-matik | Pro-Lite Technology |
| dfv Media Group | Promethean Particles |
| DuPont | Quantum Technology Supersensors |
| Durham University | Queen Mary University of London |
| Dycotec Materials | São Paulo State University (UNESP) |
| Dyson | Semitronics |
| Eindhoven University of Technology | Sensium Healthcare |
| Emerson & Renwick | Sharp Laboratories Of Europe |
| FlexEnable | SPECIFIC, Swansea University |
| Folium Optics | State University of New York, Binghamton |
| FOM Technologies | Still-image Company |
| Heriot-Watt University | Swansea University |
| Holst Centre | Tampere University |
| IDTechEx | TU Dresden |
| IMEC | UNINOVA |
| Imperial College London | University of Cambridge |
| Inseto UK | University of Colorado Boulder |
| Institute for bioengineering of Catalonia | University of Exeter |
| Istituto Italiano di Tecnologia | University of Huddersfield |
| Joanneum Research | University of Kent |
| Kaust | University of Manchester |
| Lancaster University | University of Southampton |
| Linköping University | University of Surrey |
| Loughborough University | VDL Enabling Technologies Group |
| MBraun Inertgas-Systeme GmbH | Xerox |
| Mbraun UK | Zinergy UK |

InnoLAE 2021 programme committee

The innoLAE Programme Committee advises on topics of interest to our community in academia and industry, recommends invited speakers, reviews abstract submissions from the Call for Papers, chair conference sessions, judge the best speaker and best poster awards at the conference, and act as ambassadors for the conference.



Chris Rider,
Programme
Committee Chair



Dr Tim Phillips,
IMI Europe



Cathy Curling,
Curling Consulting



Dr Emre Ozer,
ARM



Prof Luisa Torsi,
University of Bari



Dr Luigi Occhipinti,
University of
Cambridge



Dr Natasha
Conway, Paragraf



Prof George
Malliaras,
University of
Cambridge



Dr Catherine
Ramsdale,
PragmatIC



Dr Neil Chilton,
Printed Electronics



Prof Krishna Persaud,
University of
Manchester



Dr Alison Burdett,
Sensium
Healthcare



Dr Paul Smith,
Xerox R&D Canada



Prof. Cinzia
Casiraghi,
University of
Manchester



Prof. Don Lupo,
Tampere University
of Technology



Dr Dimitra
Georgiadou,
University of
Southampton



Dr Simon
Johnson, Centre
for Process
Innovation (CPI)



Prof Reinhard
Baumann, TU
Chemnitz /
Fraunhofer ENAS



Prof. Henning
Sirringhaus,
University of
Cambridge



Prof Steve Beeby
University of
Southampton

InnoLAE conference development committee

The innoLAE Conference Development Committee brings new ideas to help us develop the conference, maintaining and building on its reputation as the place to make connections between research and manufacturing. We want to maintain our equal industry/academia split and remain at the forefront of industry developments while enhancing diversity and inclusivity.



Dr Gwenhivir
Wyatt-Moon,
University of
Cambridge



(Sam) Yun Fu Chan,
Centre for Process
Innovation (CPI)



Dr Nessima
Kaabeche, Emerson
& Renwick



Ben Woodington,
University of
Cambridge

InnoLAE programme

Large-Area Electronics (LAE) is a new way of making electronics including printed, flexible, plastic, organic and bio- electronics, with applications in sectors such as healthcare, fast moving consumer goods, automotive, internet of things, printing and packaging and smart wearables. The new form factors and flexibility possible with LAE allow electronics to be deployed in non-traditional situations: in and on paper, plastic, textiles, cars and buildings, as well as on packaging and even in and on the human body.

The innoLAE programme highlights the most recent, Innovative and exciting aspects of large-area electronics.

innoLAE 2021 conference themes

- Manufacturing LAE
- High performance materials for LAE
- Novel devices and systems for LAE
- Bioelectronics
- Applications of LAE
- Sustainability of LAE

Keynote Speakers



Dr Zhenan Bao

K.K. Lee Professor of Chemical Engineering & Chair, Dept of Chemical Engineering
Stanford University

Skin-Inspired Electronics & Sensors

Dr Zhenan Bao is Department Chair and K.K. Lee Professor of Chemical Engineering, and by courtesy, a Professor of Chemistry and a Professor of Material Science and Engineering at Stanford University. Bao founded the Stanford Wearable Electronics Initiative (eWEAR) in 2016 and serves as the faculty director.

Bao was selected in Nature's 'Ten people who mattered' in 2015 as a 'Master of Materials' for her work on artificial electronic skin. She was awarded the inaugural ACS Central Science Disruptor and Innovator Prize in 2020



Steve Xu, MD

Founder & CEO
Sibel Health

Novel Bio-Electronics for ICU-Grade Monitoring in Premature Neonates

Steve Xu MD, MSc is currently the Medical Director of the Querrey Simpson Institute for Bioelectronics at Northwestern University. Xu has developed several wearable technologies with a focus on maternal, fetal, and neonatal health.

As part of his collaborative research efforts, several of his joint inventions have been licensed to early stage companies for the commercialisation of the core technology. To date, these companies have raised more than \$20 million USD and launched sensors in over 20 countries across 6 continents.



Tony Chahine

Chief Executive Officer
Myant

Enabled Textiles That Transform Human Connectedness in a Socially Distant World

Tony Chahine is an entrepreneur with a passion for solving problems. In 1992, when Tony founded Battery Plus, he was the first to bring innovative batteries to the North America market when battery technology was not widely available.

Tony's newest startup, Myant, combines his passion for disruptive technology with his extensive knowledge of the retail and consumer market. Tony has brought together a team of engineers, chemists, physicists, scientists and fashion designers to create wearable and embedded technology solutions.

Invited Speakers



Maria Smolander
VTT
Talk Title:
Sustainability of
flexible electronics



Steve Bennington
Q5D
Talk Title: Automotive
and aerospace
lightweighting



Ted Sargent
University of Toronto
Talk Title: Large-area
LEDs and
Photodetectors for
Consumer Electronics



Martin Heeney
Imperial College
London
Talk Title: Tuning
Conjugated Polymers
by Post-
Polymerization
Modification



Rosa Cuellar Franca
University of
Manchester
Talk Title: Measuring
the environmental
sustainability of
graphene using Life
Cycle Assessment:
Challenges and way
forward



Ravinder Dahiya
University of Glasgow
Talk Title: Electronic
skin – from energy
sink to energy source



Gerwin Gelinck
TNO/Holst Centre
Talk Title: Solution
processed
photodetectors for
large-area imaging
applications



John Tingay
Paragraf
Talk Title: Adoption of
Graphene as an
Electronic Material



Dimitra Georgiadou
University of
Southampton
Talk Title: 100 GHz zinc
oxide Schottky diodes
processed from
solution on a wafer
scale



Mario Caironi
Istituto Italiano di
Tecnologia (IIT)
Talk Title: From
Polymer Transistors
Operating at Radio-
Frequencies to Edible
Electronics



Simon Ogier
SmartKem
Talk Title: Low
temperature, robust
OTFT technology
suitable for a range of
current or voltage
driven display
applications



Dr Ton Van Mol
Director Flexible and
Free form
electronics at TNO
Talk Title: Flexible
electronics for
human-centric
healthcare



Prof. Dr.-Ing. Thomas
Stieglitz, University
of Freiburg - IMTEK
Talk Title Flexible
bioelectronics –
microimplants for
neuroprosthetic and
bioelectronic
medicine
applications



Dr Gemma Bale,
Cambridge
University
Talk Title:
Developing novel
optical techniques
to monitor the brain
metabolism in
newborn brain
injury



Dr Roozbeh Ghaffari,
CEO & Co-Founder
at Epicore
Biosystems

Talk Title: Soft, skin-
interfaced systems
with physiology
and biochemical
sensing capabilities

InnoLAE conference topics

Please see our [website](#) for full details

• Manufacturing LAE

- Addressing the challenges and opportunities of non-traditional substrates e.g. paper, plastics, metal, fabrics, living tissue
- Improved and novel processes for LAE manufacturing offering higher throughput, functionality, yield or lower cost
- Entirely new paradigms for LAE manufacturing
- Tackling the challenges of scale-up in LAE manufacturing, including metrology, yield, lean manufacture and design for manufacturing
- 3D printing of electronics

• High-performance materials for LAE

- Organic semiconductors
- Metal oxides
- Graphene, 2D and layered materials
- Perovskite materials
- Quantum dots
- Novel conductors and dielectrics
- Stretchable and biocompatible materials
- Biodegradable substrates, etc. (not including production technologies for materials)

• Novel devices and systems for LAE

- OLEDs for display and lighting
- Transistors, diodes, sensors, detectors, etc.
- Energy harvesting and storage using LAE (e.g. RF, piezo, thermal & solar harvesting, printable batteries and super-capacitors)
- Third generation PV – organic, perovskite, QD and other hybrids
- Circuit elements e.g. amplifiers, A-D converters, multiplexers, microprocessors etc.
- Circuits incorporating LAE including multi-element LAE device arrays
- Flexible displays – both emissive and reflective

• Bioelectronics

- Neural electronics
- Biosensors
- Drug delivery devices
- Cutaneous and implantable devices
- In vitro systems

• LAE Technology Platforms

- Flexible hybrid electronics - integrating organic or printed electronics with thinned and unpackaged conventional semiconductor devices
- E-textiles and wearable electronics
- Stretchable and conformable electronics
- Structural electronics

• Applications of LAE

- Internet of Things
- Healthcare and medical
- Automotive
- Smart buildings
- Security applications
- Design of systems using LAE components for particular applications
- Application case studies of new LAE systems used in market trials

• Sustainability of LAE

- Sustainable materials; End-of-life management; waste reduction; recycling and reuse of LAE materials, components and systems; Opportunities for LAE to enable a sustainable economy

InnoLAE call for posters

Present your latest work to an audience of large-area electronics professionals across academia and industry.

Each poster will have its own dedicated page on our online event platform where attendees can view your poster - please see an example template to the right (there will be some adjustments as new features are released).

The individual poster pages will include the following:

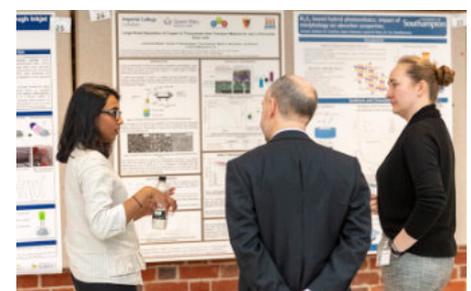
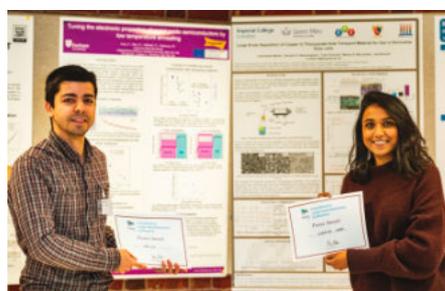
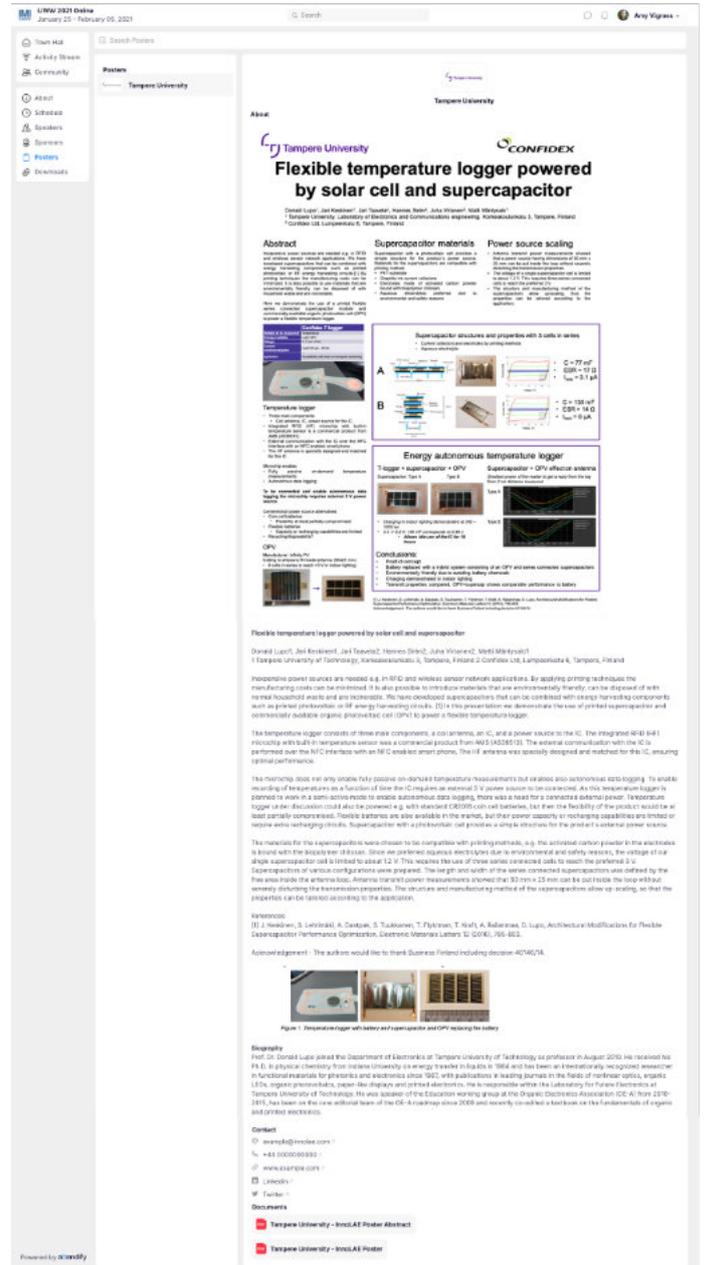
- Image of your poster
- Poster abstract
- Author biography and contact details
- Public chat function on poster page
- Private chat function through your personal profile
- 1 to 1 video chats through the poster page
- PDF downloads of your poster and abstract

Please send us a pdf copy of your poster in portrait format. For consistency we will be using the usual poster measurements as follows:

A0 poster is created in Portrait format: 841mm x 1189mm. Please ensure that your poster does not exceed this size and we recommend that you leave a margin of at least 3 inches (7.5 cm) around the poster.

Poster Prize

Please ensure that you are responsive to questions through the text and video chat functions throughout the event. Posters will be evaluated by the Programme Committee and the best posters will be awarded prizes at the Poster Reception.



Supporting Events - Monday 22nd February

Wet Processing Technologies for LAE Course

The Wet Processing Short Course is delivered by Printed Electronics Ltd (PEL) and the Centre for Process Innovation (CPI). It covers the inks and printer technology required for deposition techniques including screen, inkjet and flexo/gravure printing. The short course also covers coating techniques such as doctor blade and slot die, drawdown, spin and spray coating. In each case the advantages, disadvantages and technological challenges of each technique will be covered, along with issues arising in scale up for manufacture.



Course Outline

Wet Processing (Formulation, Coating and Printing)

Materials and Formulation

- Inks
 - Silver, copper, carbon and other ink materials
- Formulation
 - Rheology
 - Solvent-based inks
 - Curable inks
 - Ink formulation components
 - Mixing and scale-up
- Substrates
 - Polymers, glass, paper, textiles and metals

Printing

- Inkjet
- Screen print
- Other print technologies such as flexography, gravure etc.

Large Area Coating Methods

- Batch coating
 - Drawdown and dip
 - Spin coating
- Continuous processes
 - Doctor blade
 - Spray coating
 - Slot die
 - Scale-up for continuous processes
- Applications of large area coating

Supporting Events - Tuesday 23rd February

Dry Processing Technologies for LAE

The Dry Processing Short Course is delivered by the Centre for Process Innovation (CPI). It covers the key processing techniques required for large area electronic device manufacture, including vacuum deposition, photolithography, laser ablation and wet and dry etching. In each case the advantages, disadvantages and technological challenges of each technique will be covered, along with issues arising in scale up for manufacture.

Course Outline

Dry Processing (Thin Film Fabrication and Patterning)

Vacuum Deposition

- Physical vapour deposition
- Chemical vapour deposition
- Description of evaporation process
- Description of sputtering process
- Comparison of evaporation vs sputtering
- PVD chamber design
 - Requirements for a process chamber
 - Discussion on vacuum pumps types
 - Discussion on power supplies
- PVD process conditions
 - Pressure, time & power vs deposition rate & thickness
 - Magnetron sputtering
 - Metal vs reactive sputtering
 - Target types
- Description of ALD process
 - ALD cycle
 - Temporal vs spatial ALD
 - Current tool types

Photolithography Processes

- Photo processes
 - Positive and negative resists
 - Lift off resists
 - Image reversal resists
 - Cured dielectrics
 - Hard mask process
 - UV-NIL

Photolithography Processes Cont.

- Photo tool set
 - Spin Coating
 - Alignment
 - Maskless photolithography
 - Developing photoresist
- Common issue considerations
 - Resist adhesion
 - Reflectivity of the material or underlying material
 - The planarity of the material
 - Etch characteristics of the material
 - Resist removal method
 - Thermal stability of sublayers and deposited material
 - Exposure factors

Laser Processing for Ablation and Patterning

Etching Processes

- Differences between wet and dry etching
- Isotropic versus anisotropic
- Typical wet etch chemistries
- Typical wet etch problems
- Plasma etch fundamentals
- Selectivity, etch rate, uniformity
- Steps in a plasma etch process
- Typical plasma chemistries

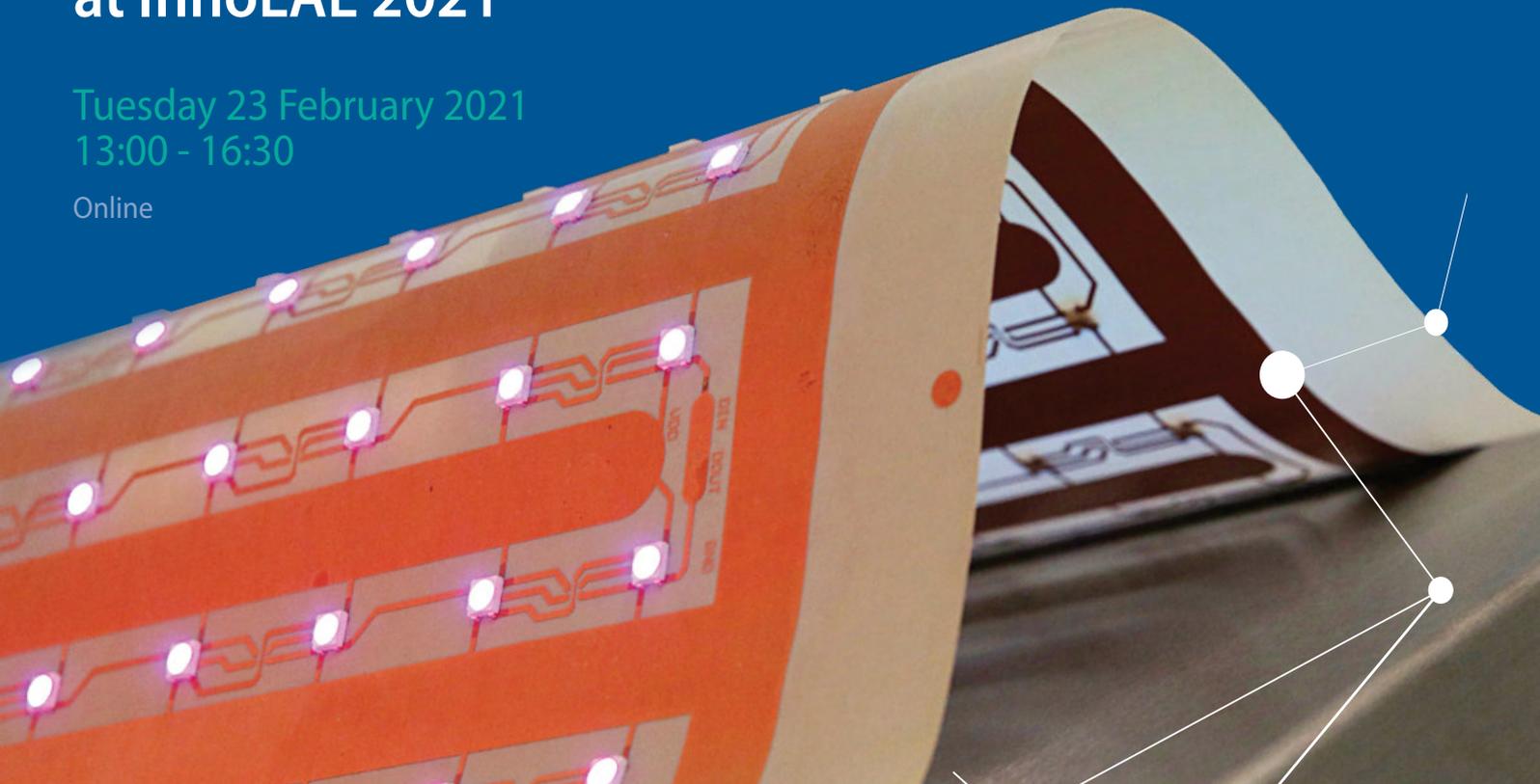
Integration

- Brief overview of the CPI integration facility
- Case studies

CPI Industry Networking Day at InnoLAE 2021

Tuesday 23 February 2021
13:00 - 16:30

Online



Making connections: Accelerating innovation in flexible and hybrid electronics

innoLAE 2021 industry day is the UK's leading networking event focusing on the industrialisation of printed and flexible electronics based technologies.

Come along to the industry day to gain access to decision-makers associated with large-area electronics. You will hear from industry experts on what the market drivers are and how the technology can be used across markets to get significant benefits. You'll have an opportunity to be part of the networking session and gain access to the leaders in research, technology innovation and manufacturing active today in flexible electronics.

Join CPI for this exciting event and come away with an understanding of how flexible hybrid electronics can benefit your business and the markets you work in.

Reasons to attend

- Gain access to **decision-makers** associated with large-area electronics
- Learn from the **leading companies** active in large-area electronics
- Network with **key players** in the industry in one afternoon

Attendance is free

[Find out more](#)

InnoLAE 2021

Who should attend?

- Researchers
- Business Development professionals
- End-users
- Process developers
- Manufacturing engineers
- Technology scouts

Sectors

- Electronics and displays
- Sensors and devices
- Energy
- Printing and packaging
- Healthcare and biomedical
- Automotive
- Aerospace and defence

Why should you attend?

- Gain access to key decision-makers in the UK LAE community
- Hear the latest results from academics
- Learn from representatives of global companies active in the technology
- Form new partnerships with delegates, vendors and speakers
- Network with colleagues through the online event platform



[Find out more on our website](#)



Sponsor innoLAE 2021

All main sponsorship packages come with additional benefits:

- Sponsorship promoted online with your company logos on the conference website, social media and emails to the innoLAE database
- Company logo displayed on the conference portal
- Company logo displayed on conference literature, including the downloadable conference programme given to all delegates

Platinum

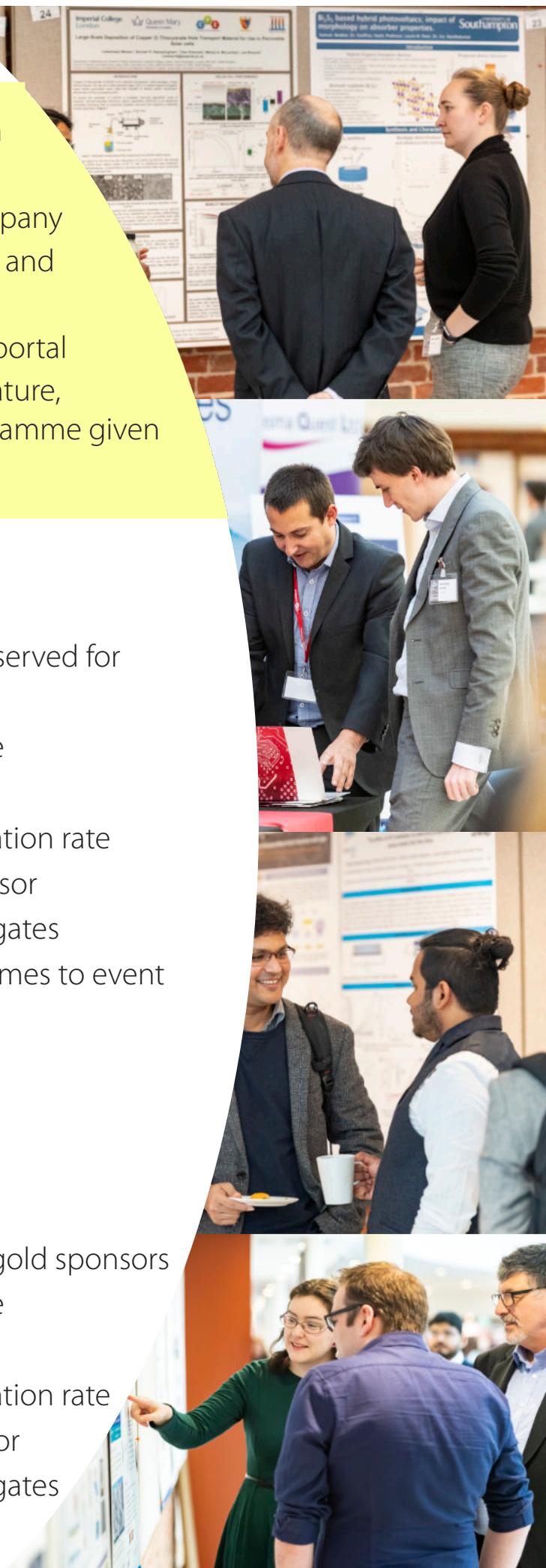
£5,495 (+VAT) **Sold Out**

- Prominent display space in exhibition area reserved for platinum sponsors
- Speaker/presentation slot in main conference
- 5 complimentary delegate places
- Additional representatives at reduced registration rate
- Promotion of company as speaker prize sponsor
- Distribution of company brochure to all delegates
- Specific platinum sponsor logo visible at all times to event delegates
- Acknowledgement by conference chair

Gold

£1,895 (+VAT) Three opportunities available

- Display space in exhibition area reserved for gold sponsors
- Speaker/presentation slot in main conference
- 3 complimentary delegate places
- Additional representatives at reduced registration rate
- Promotion of company as poster prize sponsor
- Distribution of company brochure to all delegates
- Acknowledgement by conference chair





Silver

£1,095 (+VAT) Limited packages available

- Display space in exhibition area reserved for silver sponsors
- 2 complimentary delegate places
- Additional representatives at reduced rate
- Acknowledgement by conference chair



Bronze

£495 (+VAT)

- Display space in exhibition area
- 1 complimentary delegate place
- Additional representatives at reduced rate



Additional sponsorship options

Conference programme advertisement

£125 (+VAT) Limited opportunities available

Display a full page, full colour advertisement in a prominent location within our glossy conference programme, received by all conference attendees

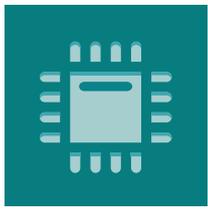


Literature Distribution

Attendees: £50 (+VAT)

Non-Attendees: £100 (+VAT)

Make your literature available for delegates to read throughout the conference. This sponsorship allows for the display of a company leaflet brochure/report on the literature table



sensors



an Open Access Journal by MDPI

20

Volumes (2001)

29,323

Articles published so far

9870

Articles have been cited 10 times or more (h-10 index) by 01 Nov. 2020

39 days

From submission to publication (median of 2020 to date)

Related Special Issues:

Advanced Interface Circuits for Sensor Systems (1 May 2021)

Guest Editors: Prof. Dr. Pak Kwong Chan and Prof. Dr. Holden King-Ho Li



Textile Sensors Based on Screen-Printing Technology (18 June 2021)

Guest Editor: Prof. Dr. Eduardo García Breijo



Organic Bioelectronics, Adaptive Materials and Sensors (30 June 2021)

Guest Editor: Dr. M. Daniela Angione



Advanced Flexible Sensors and Electronics (30 September 2021)

Guest Editor: Prof. Dr. Sang-Hee Ko Park



Upcoming conference:

I3S 2021 8th International Symposium on Sensor Science
17–28 May 2021, ONLINE

8th International Symposium on Sensor Science (I3S 2021)

17–28 May 2021, online

Conference Chairs: Professor Gianuario Cuniberti, Dr. Larysa Baraban



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We look forward to hearing from you!

Contact us at:



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