



Innovations in Large-Area Electronics Conference

20 - 22 February 2024

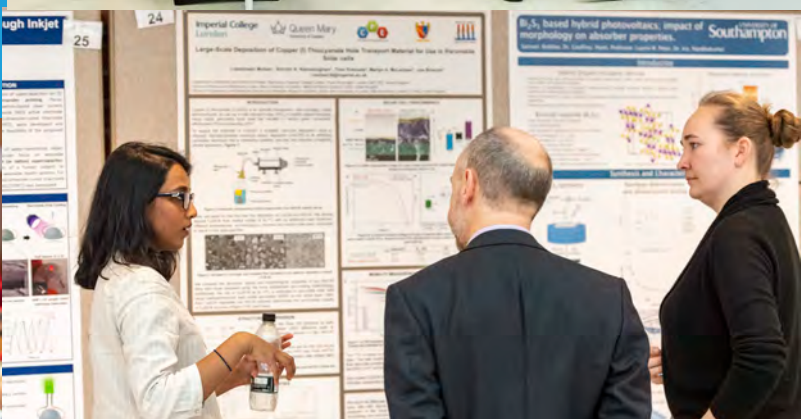
Cripps Court Conference Centre, Magdalene College, Cambridge, UK

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

The 10th annual Innovations in Large-Area Electronics Conference (innoLAE 2024) will be held online on 20-22 February 2024, Cripps Court Conference Centre, Magdalene College, Cambridge, UK.

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:
Short Courses - 20 February 2024
Conference - 21-22 February 2024



About the Conference



The 10th annual Innovations in Large-Area Electronics Conference (InnoLAE 2024) and supporting events will be held online on 20-22 February 2024. The two-day conference programme (21-22 February) highlights the latest developments in large-area electronics (LAE), a new way of making electronics.

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 2024 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.



"The conference brings together a wide variety of Attendees - Technologies & Business/Academic"

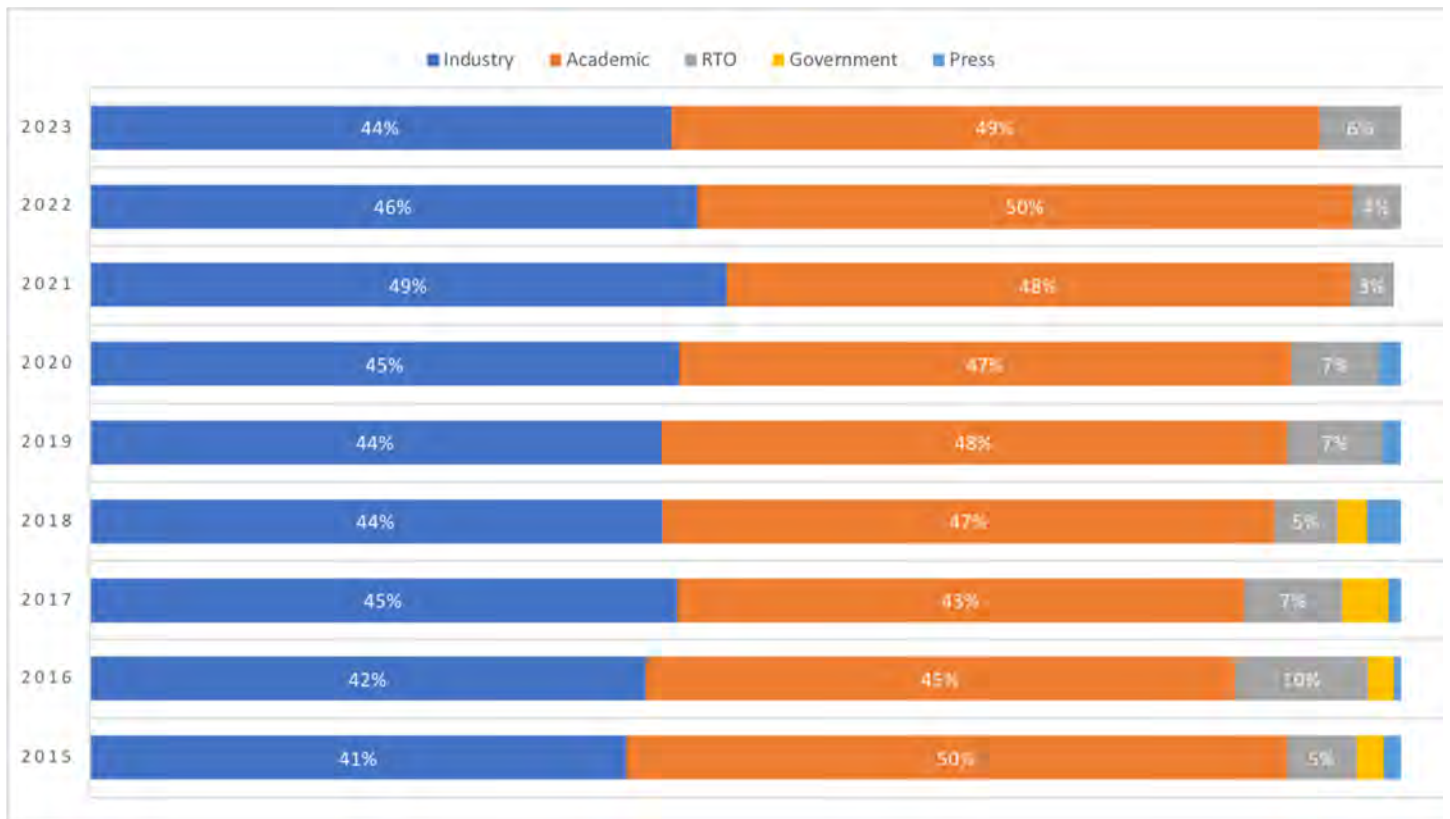
innoLAE 2023 Attendee

innoLAE

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 seven 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 from across the globe.



During this period of growth and change, 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.

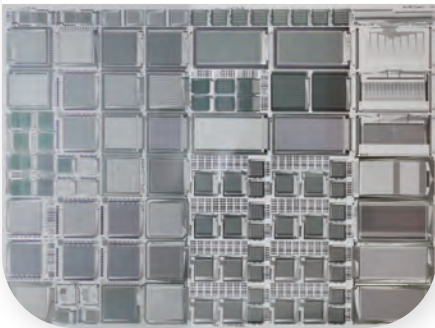


LinkZill

LinkZill is a fabless designer and supplier of thin film transistor (TFT) for a variety of applications of sensing, display, biotech and life science.

For optoelectronic applications, the product matrix of LinkZill includes TFT sensing and display array chips with their compatible readout and driving systems, respectively. These products have been widely used for state-of-the-art research such as Perovskite X-ray sensing, infrared sensing, finger/palm-print sensing, gas/-pressure sensing, Perovskite LEDs, quantum-dot LEDs and micro-LEDs. LinkZill also provides customized TFT design and manufacturing with customer's choice of TFT type (a-Si, IGZO, LTPS, OTFT, etc.), substrates (glass, plastic) and size (up to G6.5 line).

TFT Chip



LinkZill values the various needs of our customers and customizes the design of our TFT chips accordingly. TFT chip design from different customers will be pieced together and integrated for overall tape-out and manufacturing.

TFT Device Type: a-Si, IGZO, LTPS, Organic TFT, LTPO, et al. Substrate material (glass or plastic) and size (up to G6.5 line) can be customized.

TruEbox 03MR (64×64)



This product mainly for collecting the current signal of sensor array and imaging, which can support up to 64*64 definition array. Matrix readout system can provide 64 selecting signals, 2 DC bias voltages and 64 current readout channels. All current data will be transmitted to android terminal device through Bluetooth and converted to a 256 grey level image based on the strength of the current. It very suitable for light or pressure imaging by thin film transistor (TFT) array chip.

TruEbox 04MD (256×256)



This product is mainly used for signal driving of array diplay devices and supports up to 256*256 resolution array driving. It can provide 32+8 rows of select signals, 64+4 columns of feed signals, and 2 DC bias signals. TruEbox can customize the diplay of the array display device through the Wi-Fi, the Android mobile terminal, and the self-designed APP that transmits the compiled array signal. It can realize the display and luminescence of new display devices such as QLED and perovskite LED.

LinkZill also combines TFT semiconductor technology with life sciences through our TFT bio-chip platform, and has achieved industrial applications in high-throughput DNA synthesis, precise biological droplet manipulation, in-vitro diagnostics (IVD) and bio-sensing.

So far, LinkZill has served more than 100 companies, universities and research institutes worldwide with our core TFT chip technology, and has accumulated technical capabilities and experience from TFT chip design, simulation, process to system integration.

Contact Us



Business Collaboration: info@linkzill.com

Media Collaboration: media@linkzill.com



Website

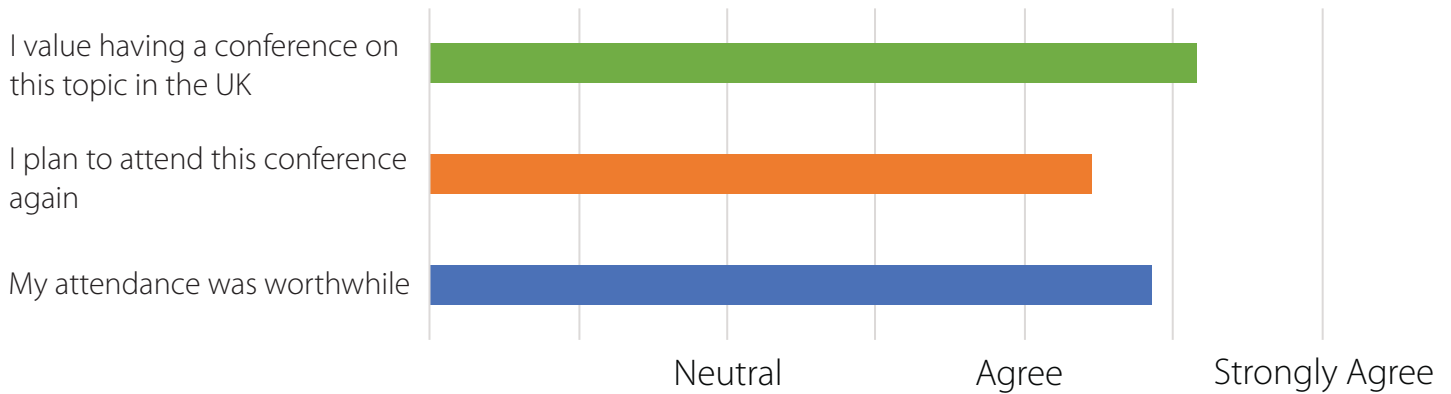


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InnoLAE delegate feedback

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 2023 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

“InnoLAE brings academia and industries together to discuss latest technologies and seek potential collaborative project opportunities as well as provide the platform for attendee networking”

innoLAE 2022 delegate

“The conference isn't afraid to touch on all areas from material science, electronics, biology, chemistry and product design. It is very comprehensive and has great engagement from many influential players in the field. Ideal for both new starters in the area or seasoned veterans”

innoLAE 2023 attendee



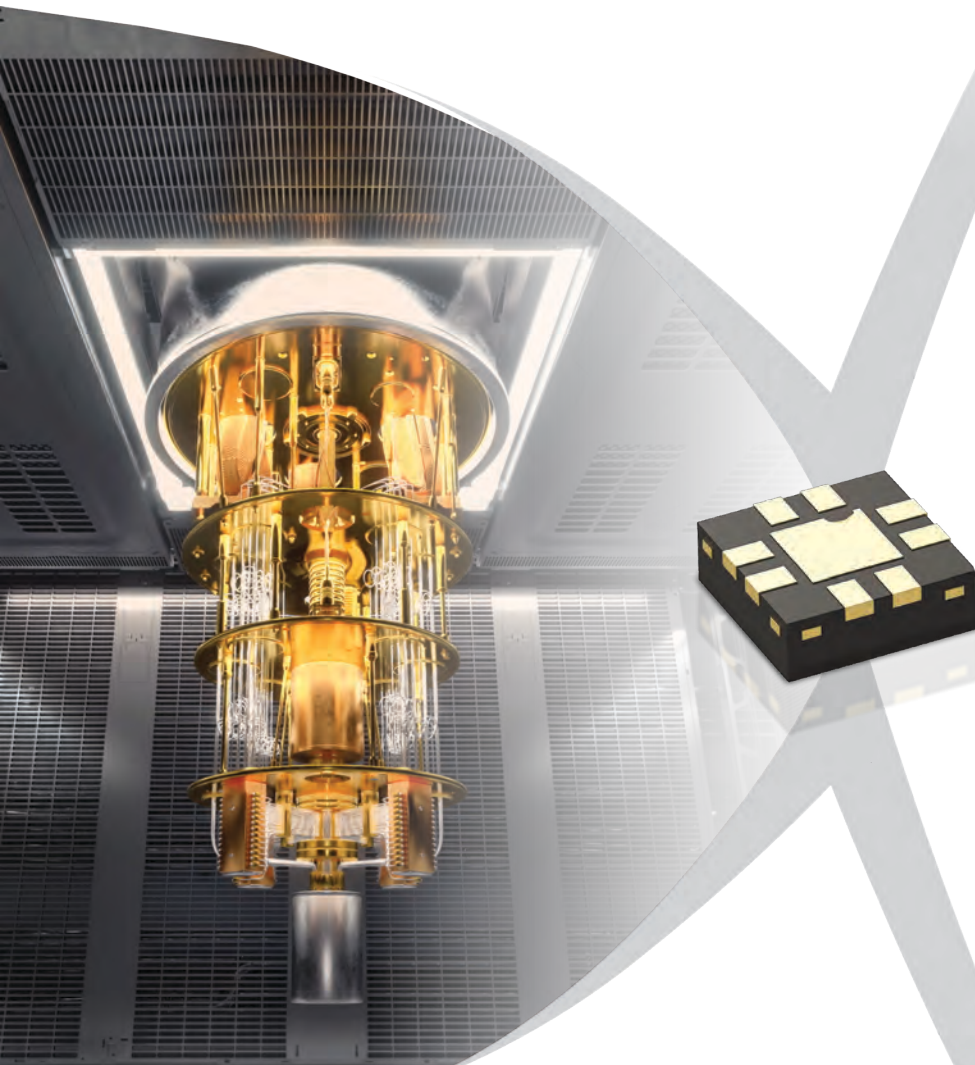
Current InnoLAE 2024 Attendees

A-Gas Electronic Materials	Nottingham Trent University
Åbo Akademi University	NOVA.ID
Cambridge Display Technology Ltd	Paragraf
CENIMAT	Pattern Ltd
Centre for Process Innovation Ltd (CPI)	Polish Security Printing Works
Chungnam National University	Polytechnique Montreal
CSEM	PragmatIC
Curling Consulting	Printed Electronics Limited
De Montfort University	São Paulo Research Foundation
Flexenable Technology Limited	Semitronics
Footfalls & Heartbeats	Stanford University
Free University of Bolzano	Swansea University
Hanbat National University	Tampere University
Henry Royce Institute, University of Cambridge	Tohoku University
IDTechEx	Universiteit Hasselt
imec	University of Bologna
Imperial College London	University of California San Diego (UCSD)
Indian Institute of Science Bangalore	University of California, Berkeley
Institut de Ciència de Materials de Barcelona	University of Cambridge
Institut Mines- Telecom / Mines Saint-Etienne	University of Coimbra
Intel	University of Glasgow
KAUST	University of Leeds
KU Leuven	University of Manchester
LinkZill	University of São Paulo State
MBraun UK Ltd	University of Southampton
NASA	University of Strathclyde
National Research Council of Canada	University of Surrey
Northwestern University	



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and academia at InnoLAE 2024!**

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InnoLAE 2024 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.



Dr Maxim Shkunov,
University of Surrey



Prof Luisa Petti, Free
University of
Bolzano



Cathy Curling,
Curling Consulting



Prof George
Malliaras, University
of Cambridge



Dr Dimitra
Georgiadou,
University of
Southampton



Dr Krishna Persaud,
University of
Manchester



Dr Francesca
Santoro, IIT



Prof. Henning
Sirringhaus,
University of
Cambridge



Dr Vincenzo
Pecunia, Simon
Fraser University



Prof Cinzia
Casiraghi,
University of
Manchester



Dr Neil Chilton,
Printed Electronics



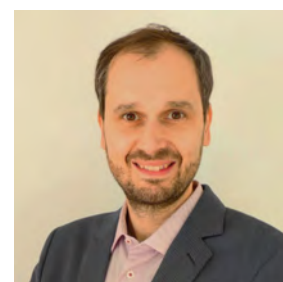
Dr Natasha
Conway, Paragraf



Dr Feras Alkhalil,
PragmatIC



Dr Simon Johnson,
Centre for Process
Innovation (CPI)



Dr Paschalis
Gkoupidenis, Max
Planck Institute for
Polymer Research



Dr Roozbeh
Ghaffari,
Northwestern
University



Dr Luigi Occhipinti,
University of
Cambridge



Dr Tim Phillips,
IMI Europe

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 2024 conference themes

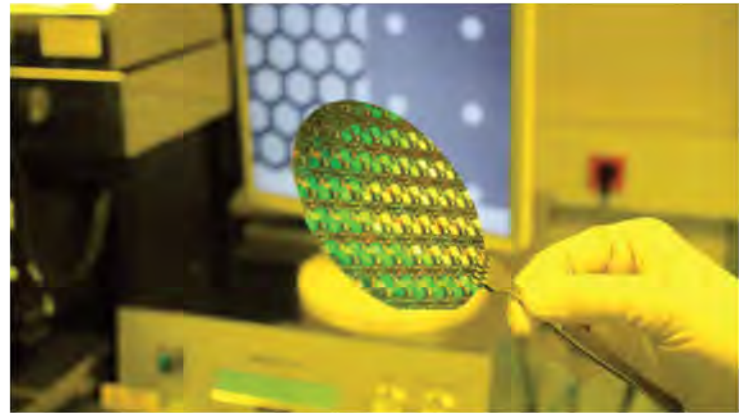
- Manufacturing LAE
- High performance materials for LAE
- Novel devices and systems for LAE
- Bioelectronics
- Applications of LAE
- Sustainability & Energy Efficiency

InnoLAE 2024 Conference Structure

Day One: 21 February 2024	Day Two: 22 February 2024
Registration	
Keynote 1	Keynote 3
Refreshments	Refreshments
Parallel Sessions 1 & 2	Parallel Sessions 5 & 6
Lunch, Posters & Exhibition	Lunch, Posters & Exhibition
Keynote 2	Keynote 4
Refreshments	Refreshments
Parallel Sessions 3 & 4	Parallel Sessions 7 & 8
Networking Reception	Speaker & Poster Awards
Optional Gala Dinner	

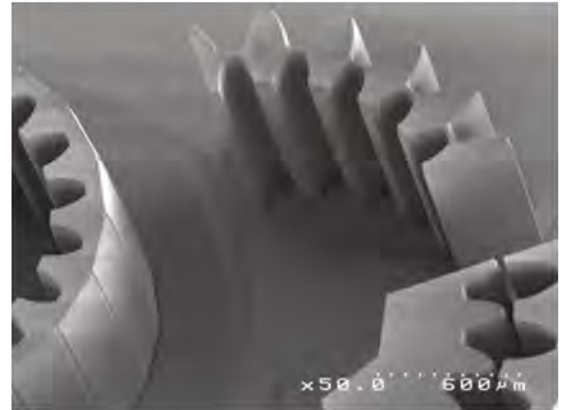
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PEL

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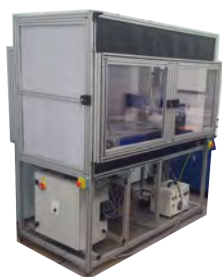
Manufacturing, Equipment and Materials

EQUIPMENT SALES

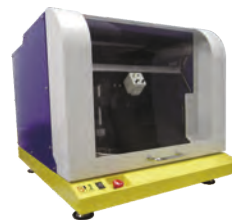


Micro-tec

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PEL 3DSP



SIJ - sub-micron R&D print platforms

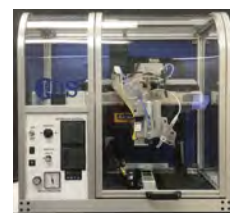


Neotech AMT

Advanced Manufacturing Technologies for 3D Printed Electronics.



PEL



NanoJet™ Desktop
Aerosol Print System



PEL's equipment and support portfolio includes SIJ Superfine Inkjet, Microtec best in class screen-printers, PEL's own 3DSP non contact multi-axis viscous jetting platform, PEL UV cure system for the Dimatix DMP, Neotech AMT GmbH full 5 axis versatile printing platform and IDS Nanojet aerosol-jet platforms.

Please contact us at info@printedelectronics.co.uk, or call at +44 1827 263 338

Keynote Speakers



Prof Alberto Salleo

Professor and Department Chair
Department of Materials Science and
Engineering
Stanford University

Ions, Electrons & Polymers: Fast Ion Insertion Towards Ghz Iontronics

Alberto Salleo is currently Professor of Materials Science and Department Chair at Stanford University. Alberto Salleo holds a Laurea degree in Chemistry from La Sapienza and graduated as a Fulbright Fellow with a PhD in Materials Science from UC Berkeley in 2001. From 2001 to 2005 Salleo was first post-doctoral research fellow and successively member of research staff at Xerox Palo Alto Research Center. In 2005 Salleo joined the Materials Science and Engineering Department at Stanford as an Assistant Professor. While at Stanford, Salleo won the NSF Career Award, the 3M Untenured Faculty Award, the SPIE Early Career Award, the Tau Beta Pi Excellence in Undergraduate Teaching Award, and the Gores Award for Excellence in Teaching, Stanford's highest teaching award. He has been a Clarivate Highly Cited Researcher since 2015 and was elected to the European Academy of Sciences in 2021, a Fellow of the Materials Research Society in 2022, and a Member of the Academia Europaea in 2023.



Prof Jonathan Rivnay

Professor of Biomedical Engineering
Northwestern University

Organic Mixed Conductors for Bioelectronics

Jonathan Rivnay is a Professor in the Department of Biomedical Engineering at Northwestern University. Jonathan earned his B.Sc. in 2006 from Cornell University. He then moved to Stanford University where he earned a M.Sc. and Ph.D. in Materials Science and Engineering, studying the structure and electronic transport properties of organic electronic materials. In 2012, he joined the Department of Bioelectronics at the Ecole des Mines de Saint-Etienne in France as a Marie Curie post-doctoral fellow, working on conducting polymer-based devices for bioelectronics. Jonathan spent 2015-2016 as a member of the research staff in the Printed Electronics group at the Palo Alto Research Center (PARC, a Xerox Co.) before joining the faculty at Northwestern in 2017. He is a recipient of the Faculty Early Career Development (CAREER) award from the National Science Foundation (2018), and a research fellowship from the Alfred P. Sloan Foundation (2019), and was named a Materials Research Society Outstanding Early Career Investigator (2020).

Keynote Speakers



Carl H Naylor

SRC Program Manager & Research Scientist
Intel

Is the Future 2D?

Carl H. Naylor is the SRC Program manager, alternate SAB rep for JUMP2.0, and Research Scientist with Intel Corporation. He received his B.A. and M.S. degree in physics from the University Joseph Fourier (Grenoble, France), followed by a Ph.D degree in physics from the University of Pennsylvania (Philadelphia, USA). He has held multiple research positions with universities across the globe: in southeast Asia, western Europe, and across north America.

He joined Intel as a Senior Research Engineer with Intel Components Research in the Novel Device Materials group, where he developed and synthesized novel nanomaterials, and searched for unique applications where they can be implemented across an Intel chip. He is now with the Corporate University Research team focused on Intel's external engagements with Academia.

He holds over 50 co-authored publications in peer reviewed journals, over 50 U.S. patents filed, and numerous industrial and academic accolades.



Prof Ana Claudia Arias

Professor of Electrical Engineering and
Computer Sciences
University of California, Berkeley

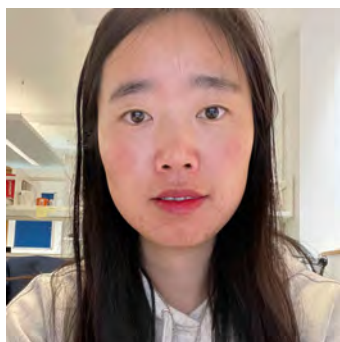
Tracking nitrogen in soil with printed electronics

Prof Arias received her PhD in Physics from the University of Cambridge, UK in 2001. Prior to that, she received her master and bachelor degrees in Physics from the Federal University of Paraná in Curitiba, Brazil in 1997 and 1995 respectively.

She joined the University of California, Berkeley in January of 2011. Prof. Arias was the Manager of the Printed Electronic Devices Area and a Member of Research Staff at PARC, a Xerox Company. She went to PARC, in 2003, from Plastic Logic in Cambridge, UK where she led the semiconductor group.

Her research focuses on the use of electronic materials processed from solution in flexible electronic systems. She uses printing techniques to fabricate flexible large area electronic devices and sensors.

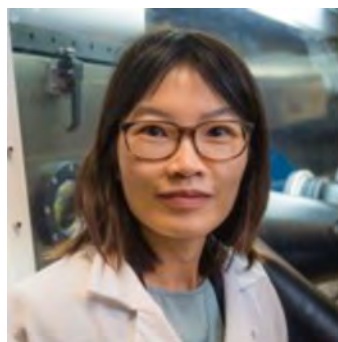
Invited Speakers



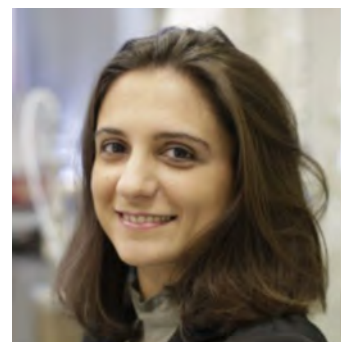
Dr Yan Wang,
Researcher at University
of Cambridge



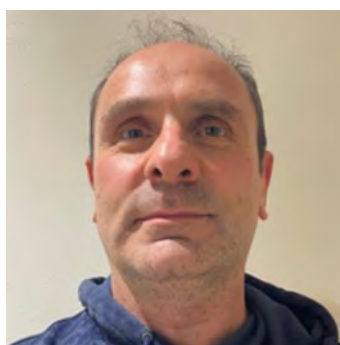
Dr Eleonora Macchia,
Assistant Professor,
Department of
Pharmacy at Åbo
Akademi University



Prof Tina Ng, Professor,
Electrical and Computer
Engineering
Department at
University of California
San Diego (UCSD)



Prof Cecilia Mattevi,
Professor of Materials
Science at Imperial
College London



Prof Fabio Cicoira,
Professor, Department
of Chemical
Engineering,
Polytechnique Montreal



Simon McMaster,
Director at Footfalls &
Heartbeats



Prof Thomas
Anthopoulos, Professor
of Emerging
Optoelectronics at
Univeristy of
Manchester



Prof Beatrice Fraboni,
Professor, Department
of Physics and
Astronomy at University
of Bologna



Prof Sayani Majumdar,
Associate Professor,
Faculty of Information
Technology and
Communication
Sciences at Tampere
University



Dr Sahika Inal, Associate
Professor of
Bioengineering at King
Abdullah University of
Science & Technology
(KAUST)

InnoLAE conference topics

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

• **Manufacturing LAE Components and Systems**

- 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, sustainability, functionality, reliability, yield or lower cost
- New approaches for LAE manufacturing including soft lithography, micro-contact printing, nano imprint lithography, self assembly
- Roll-to-roll manufacture
- Tackling the challenges of scale-up in LAE manufacturing, including metrology, yield, lean manufacture and design for manufacturing
- 3D printing/in-mould printing/additive manufacture of electronics
- Flexible hybrid electronics and novel interconnects - integrating organic or printed electronics with:
 - thinned and unpackaged conventional semiconductor devices
 - microscopic conventional components such as microLEDs
- Stretchable and conformable electronics
- Structural electronics
- Integration of LAE components
- Advancing the reliability and lifetime of LAE components and systems

• **High-performance materials for LAE**

- Organic semiconductors
- Metal oxides
- Graphene, 2D and layered materials
- Perovskite and perovskite-inspired materials
- Quantum dots
- Novel conductors and dielectrics
- Stretchable and biocompatible materials
- Biodegradable and recyclable materials
- Discovery and design of new materials using machine learning

• **Novel devices and systems for LAE**

- OLEDs for display and lighting
- Near IR OLEDs and OPDs for medical applications
- Transistors, diodes, sensors, detectors, etc.
- Energy harvesting and storage using LAE (e.g. RF, piezo, thermal and solar harvesting, printable batteries, supercapacitors and wireless charging)
- Third generation PV – organic, perovskite, QD, earth-abundant and other hybrids
- Circuit elements e.g. amplifiers, A-D converters, multiplexers, microprocessors, microcontrollers etc.
- Circuits incorporating LAE including multi-element LAE device arrays
- LAE circuit design and modelling, including design automation
- Flexible displays – both emissive and reflective
- Gas sensors
- Neuromorphic devices and circuits

InnoLAE conference topics

- **Bioelectronics**

- LAE devices and systems for bioelectronics
- New applications and business models for bioelectronics
- Neural and neuromorphic electronics
- Biosensors
- Drug delivery devices
- Wearable devices
- Cutaneous and implantable devices
- In vitro systems and printed organs
- Printed scaffolds for bioelectronics

- **Applications of LAE**

- Internet of Things
- Smart textiles, E-textiles and smart garments
- Displays
- Automotive
- Aerospace
- Smart buildings / structural health monitoring
- Security
- Smart agriculture, agri-food sensors
- Design of systems using LAE components for specific applications
- Application case studies of new LAE systems used in market trials

- **Sustainability & Energy Efficiency**

- Contribution of LAE towards a sustainable economy and 'net zero'
- Use of LAE in devices/products for circular economy (batteries, solar, etc.)
- Sustainable materials, end-of-life management, waste reduction
- Recycling and reuse of LAE materials, components and systems and lifecycle analysis

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Global metrology supplier for the semiconductor industry and scientific institutes

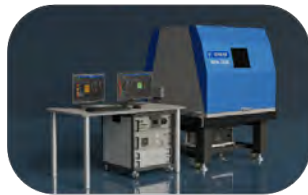


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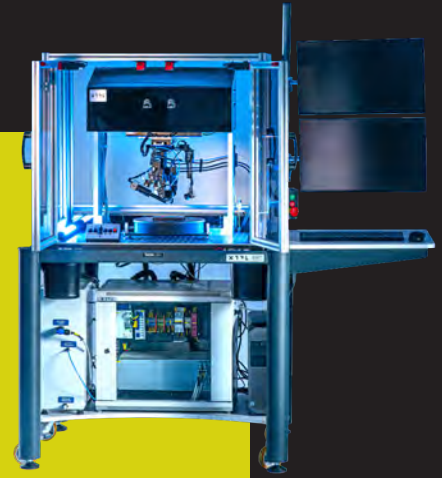
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Example usage

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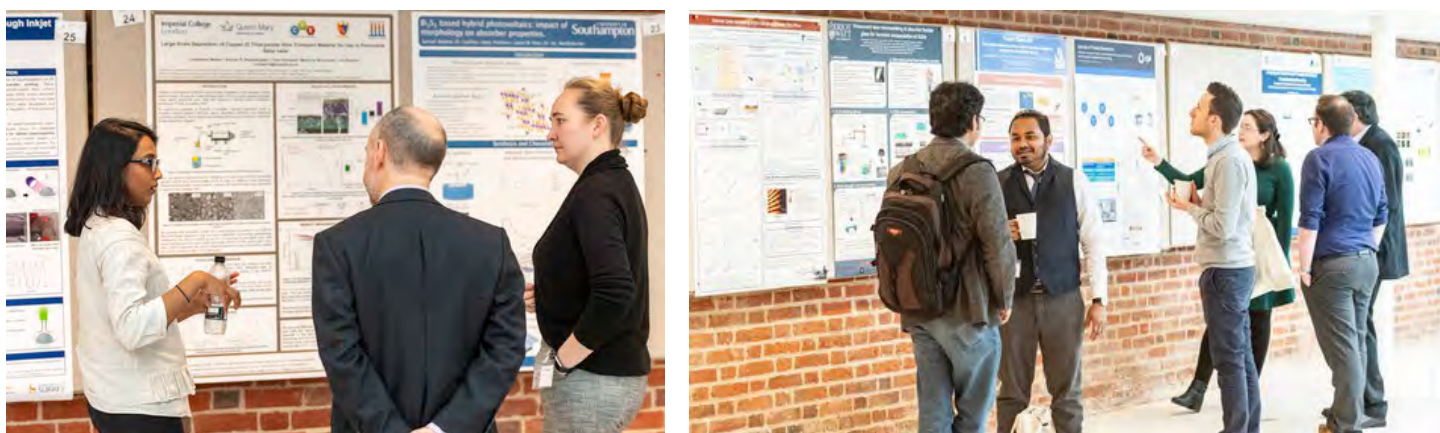
InnoLAE call for posters

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

Setting up your A0 portrait poster on Tuesday 20th February 2024 will ensure that InnoLAE 2024 attendees will have the maximum time during the welcome drinks, coffee breaks, lunch breaks and evening reception to review your poster and discuss it with you in person.

Submit your poster abstract via our website: <https://innolae.org/poster-guidelines>

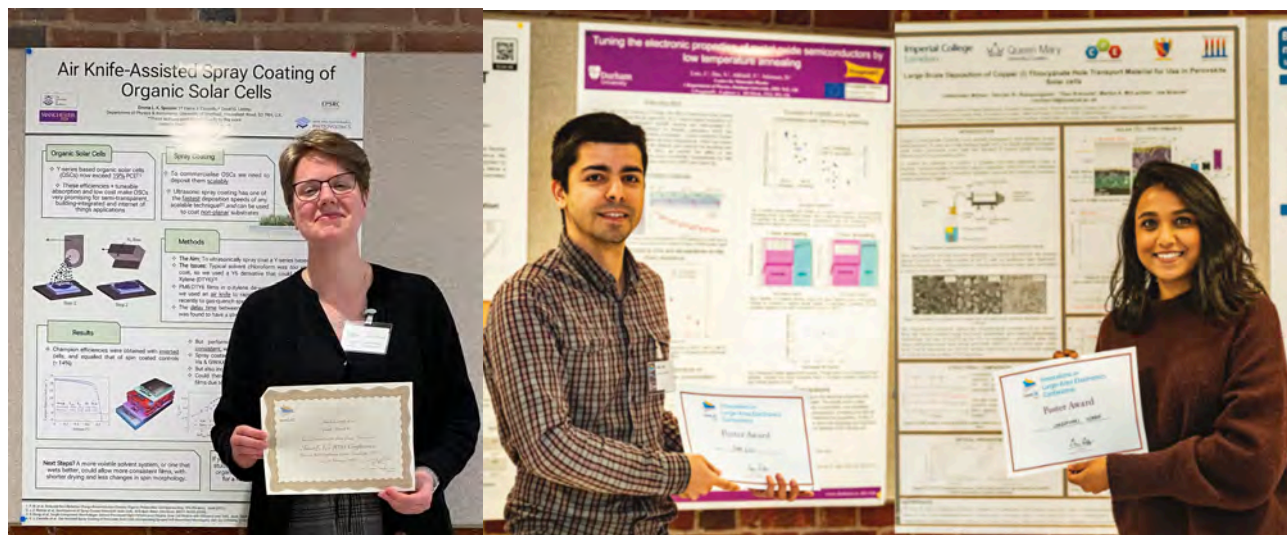
If you are unable to travel we will also accept remote posters. Send us your printed poster before the event and we will display it for you. You can also record a short 5 min video explaining your poster, covering any questions you think would be asked by attendees.



Poster Prize

Posters will be evaluated by the Programme Committee and the best posters will be awarded prizes at the Poster Reception, so please ensure that you stand by your poster during breaks and especially during the Poster Reception so you are available for discussion or questions.

Check out the previous winning posters here: <https://innolae.org/previous-poster-winners>



Supporting Events - Tuesday 20th February

Organic Bioelectronics

Bioelectronics is the interdisciplinary field which integrates biological systems and electronic devices to offer diagnostic and therapeutic solutions. With its origins dating back to the 18th century and the famous Galvani's experiments with the detached twitching frog legs, a plethora of bioelectronic devices is today available offering elegant ways to monitor and treat diseases. These devices include pacemakers and defibrillators to correct or prevent arrhythmias, cochlear implants to simulate the sense of hearing and biosensors, such as glucose monitoring devices for diabetics. In this course, we will learn what bioelectronics is and why it holds so much promise for meeting today's unmet medical needs. We will particularly focus on organics, a class of materials extremely suitable for the fabrication of state-of-the-art bioelectronic devices. In this context, we will understand why conducting polymers' unique set of features allowed them to enter the world of bioelectronics, giving rise to the era of Organic Bioelectronics.

Course Outline (AM)

- Introduction to bioelectronics
- Organic materials
- Organic bioelectronic devices (conducting polymer electrodes, OFETs, OECTs) and their fabrication approaches
- Organic bioelectronic devices applications (e.g., electrophysiology, biosensing, bioelectronic medicine)

Course Presenter

Dr Dimitrios A. Koutsouras, Physics Researcher Implantable Therapeutics IMEC, The Netherlands

Dimitrios Koutsouras is a Physics Researcher in Implantable Therapeutics at IMEC-NL, in Eindhoven (The Netherlands). He received a BS in Physics and a second one in Pharmacy from Aristotle University of Thessaloniki (Greece), and a MSc in Materials Physics from the same university. He then obtained a PhD in Organic Bioelectronics from École des Mines de Saint-Etienne in Gardanne (France), before moving to Mainz (Germany) to work as a postdoctoral researcher at the Max Planck Institute for Polymer Research (MPIP). At MPIP he worked on conducting polymer devices for biosensing, biomedical and pharmaceutical applications. At IMEC-NL, his research is focused on bioelectronic devices for improved biomedical solutions. In particular, he is interested in the design, (micro)fabrication and clinical translation of multimodal bioelectronic devices with biosensing, stimulating and therapeutic functions.



Supporting Events - Tuesday 20th February

Wet Processing Technologies for LAE Course

The Wet Processing Short Course is delivered by Printed Electronics Ltd (PEL). 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 (PM)

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.

Course Presenters

Dr Neil Chilton, Technical Director
Printed Electronics Limited, UK



Neil has more than twenty years' experience in the field of electronics and electronic components. After completing his BSc and PhD in Physics, his technical career took him to Japan where he worked for four years at the advanced materials research division of Nippon Steel Corporation. After returning to the UK he joined Europe's then largest printed circuit board manufacturing company where he was later part of an MBO team and technical director. In 2006, together with co-founder Dr Steve Jones, he started Printed Electronics Limited to focus on the practical use of inkjet for manufacturing electronic interconnects, devices and systems.

Dr Clare Conboy, Formulation Chemist
Printed Electronics Limited, UK



Clare has more than 20 years' experience of formulating and characterising fluids for spray and printing applications. This includes many years of working with inkjet inks for piezo and thermal DOD printheads, initially for graphics and in recent years for materials deposition applications, including a diverse range of materials including metals, inorganics and adhesives in a range of solvent systems. Following completion of a PhD in Chemistry, she has worked for a number of organisations with a focus on inkjet technology, including Xaar and Plastic Logic. Clare has been involved with Printed Electronics Limited since its establishment.

Supporting Events - Tuesday 20th February

Bioelectronics Based On Electrical Double Layers

This course, delivered by Prof Henrique Leonel Gomes of Coimbra University, focuses on electrical methods to characterise devices that use electrical double-layers for bioelectronic sensing. These devices encompass a wide array of applications, such as skin-adherent devices for monitoring physiological changes on the skin's surface or electrophysiological signals. A critical aspect of developing these types of bioelectrical devices lies in understanding the design principles that yield optimal sensing performance. This involves careful consideration of device geometry and a judicious selection of materials used in their fabrication, which will be covered in this course.

Course Outline (PM)

Introduction

Fundamental concepts about electrical measurements in bioelectronic devices

The electrical double layer (EDL)

- The EDL and its role in bioelectronic sensing devices.
- The electrical impedance of the EDL
- Drifts and long-term electrical stability of the EDL.
- The noise generated by the EDL and the detection limits in voltage and in the current detection method.
- Geometrical design rules to optimize devices that use the EDLs for sensing.
- Material strategies to optimize the EDL impedance for sensing.
- Electrical probing of changes in the electrical double-layer. Steady-state techniques, transient analysis.
- Electrical modeling of the EDL and parameter extraction for sensing purposes.
- Neuromorphic behaviour of EDLs.

Electrical stimulation through electrical double-layers (tissues and cells)

- The displacement current across capacitors and their impact on cells and tissues.
- Transient analysis of EDL using equivalent circuits.
- Electrochemical drifts and calibration.

Electrolyte gated transistor devices

- Operation principle.
- Diode-gated transistors.
- Geometrical design rules for electrolyte-gated transistors.
- Recipes for a proper electrical characterization of electrolyte-gated transistors.
- Electrical techniques for probing electrolyte gated transistors when used as sensors.

Electrophysiological sensing

- Bioelectrical signals in excitable and non-excitable cells, including bioelectrical signals in plants.
- Detection amplification of ultra-low frequency bioelectrical signals.
- Instrumentation, amplification, and bandwidth consideration.
- Electrical noise.

Applications of bioelectronic devices

- Skin adherent devices.
- Brain-machine interfaces.
- Electrophysiological monitoring of biological tissues and cells.
- Devices for monitoring plants and their applications in agriculture.
- Detect
- Detection of microorganisms (bacteria, algae, etc)



ROYCE EQUIPMENT ACCESS

The Henry Royce Institute provides a network of open access deposition, fabrication and characterisation facilities at the University of Cambridge to drive the development of energy efficient materials. All equipment is available for use by academia and industry both locally and nationally.

The Ambient Processing Cluster Facility enables processing and material investigation of a range of device types including:

- Perovskite PV, photonics and scintillators; Organic PV
- Li and other ion batteries; thermoelectrics
- devices for artificial photosynthesis; Bio-FETS; OLEDs

Equipment includes, ALD, wet chemical printing, PLD, and thermal evaporation and sputtering. Also, our 3D Bioelectronics Facility allows for the testing of 3D materials and bioelectronic devices with cells.

Seed funding is often available for projects, contact royce@maxwell.cam.ac.uk for more information.



ROYCE



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For almost 50 years, MBRAUN offers dedicated solutions to process air-sensitive materials and components under inert conditions.

During the recent years MBRAUN improved the portfolio especially for vacuum PVD systems and became one of the world leading suppliers for glovebox integrated vacuum deposition systems.

On MBRAUN's special developed Perovskite deposition systems, the PEROVap, with its unique technology, researchers around the globe were able to achieve several world records with their Perovskite tandem solar cells. In combination with a strong partner network MBRAUN offers turnkey solutions from R&D to manufacturing level comprised of in-house knowledge and system solutions from its partners.



InnoLAE 2024 Event Schedule

The week at a glance:

	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	
Tuesday 20 February		Short Course: Organic Bioelectronics					Short Course: Wet Processing Technologies for LAE								
		Supporting Event To Be Confirmed					Short Course: Bioelectronic Devices Based On Electrical-Double-Layers								
Wednesday 21 February		InnoLAE Conference				Lunch Break	InnoLAE Conference				Evening Reception	Gala Dinner			
		Exhibition					Exhibition								
		Poster Display					Poster Display								
Thursday 22 February		InnoLAE Conference				Lunch Break	InnoLAE Conference								
		Exhibition					Exhibition								
		Poster Display					Poster Display								

Tuesday 20th February 2024

Short Course - Organic Bioelectronics - AM

In this course, led by Dr Dimitrios A. Koutsouras of IMEC, we will learn what bioelectronics is and why it holds so much promise for meeting today's unmet medical needs. We will particularly focus on organics, a class of materials extremely suitable for the fabrication of state-of-the-art bioelectronic devices. In this context, we will understand why conducting polymers' unique set of features allowed them to enter the world of bioelectronics, giving rise to the era of Organic Bioelectronics.

Short Course - Wet Processing Technologies for LAE - PM

This course, Led by Dr Neil Chilton & Dr Clare Conboy of Printed Electronics Limited, 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.

Short Course - Bioelectronics Based on Electrical Double Layers - PM

This course, led by Dr Henrique Leonel Gomes of Coimbra University, focuses on electrical methods to characterize devices that use electrical double-layers for bioelectronic sensing. These devices encompass a wide array of applications, such, as skin-adherent devices for monitoring physiological changes on the skin's surface or electrophysiological signals. A critical aspect of developing these types of bioelectrical devices lies in understanding the design principles that yield optimal sensing performance. This involves careful consideration of device geometry and a judicious selection of materials used in their fabrication. Given that these bioelectrical devices operate within electrolyte mediums, it is imperative to employ electrical addressing techniques that minimize electrochemical reactions, which often lead to drifts and instabilities. Furthermore, these devices often are used to detect ultra-weak signals at low frequencies, the minimization of intrinsic and extrinsic electrical noise is also crucial.

InnoLAE 2024 Event Schedule

Wednesday 21st February 2024

InnoLAE Conference

The two-day conference programme highlights the latest developments in large-area electronics (LAE). LAE is a new way of making electronics including advances in materials, devices, systems, manufacturing processes and enablers.

Applications including lighting, energy harvesting and flexible photovoltaics, flexible and printed displays, sensors, integrated smart systems, e-textiles and bioelectronics will be 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.

Sponsor Exhibition

Exhibitors will have display stands in the break area, which gives you ample time during breaks and receptions to see demonstrations, find out the latest developments from key industry players and talk to company representatives.

The innoLAE conference & exhibition positions you in front of researchers and developers across a wide range of printed and flexible electronics applications. Sponsoring the event gives you the opportunity to be at the forefront of the industry, presenting your expertise and products to your target audience. We have a number of sponsorship/exhibition options available, or contact us for a bespoke package.

Poster Display

During the conference there will be a display of submitted posters from researchers across industry and academia for you to browse and discuss with the authors. These posters will be reviewed by our Programme Committee and a prize presented to the best poster.

Gala Dinner

Continue networking and unwind in true Cambridge style by signing up for the conference gala dinner - hosted in The Hall at Magdalene College.

The innoLAE Gala Dinner always receives positive feedback as this dinner gives you an excellent opportunity to indulge in the rich history of Cambridge, enjoying a delicious three course meal and continue to network in a relaxing atmosphere.

Thursday 22nd February 2024

InnoLAE Conference - continued

Prizes awarded for best speaker and best poster, as voted for by the Programme Committee.

Speaker prize sponsored by LinkZilll.

Poster prize sponsored by Paragraf with prizes supplied by The Royal Society of Chemistry.

HORIBA

HORIBA's expertise analytical solutions enable **development characterisation** of novel printed, flexible, hybrid, plastic, organic, and bio-electronic materials.

With **decades of experience** in spectroscopic techniques, HORIBA supports the complete **product life cycle**, from R&D through to **large scale manufacturing**.



Scan here to download our free "Characterisation of Semiconductors by Photoluminescence using Microspectroscopy" e-book that demonstrates a range of areas and applications where **HORIBA** are supporting material scientists and developers in characterising and qualifying performance.

Contact us today to discuss your current and future **characterisation challenges**.



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Inkjet Ink Characterisation Practical Course 2024

15 - 18 April 2024, Meteor inkjet Laboratory, Cambridge, UK

A practical course covering viscosity, dispersions, jetting & surfaces. With hands-on demonstrations of the equipment and a chance to bring your own samples for assessment.

www.imieurope.com

Inkjet Summer School 2024

1 - 5 July 2024, Novotel Gent Centrum Hotel, Ghent, Belgium

A selection of six high quality 1.5 day technical courses covering a variety of topics of interest within inkjet printing, including the world-famous Inkjet Academy. The IMI Europe Inkjet Summer School is the ideal way to gain a more detailed understanding of a specific technology area.

InnoLAE 2024

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](#)



Day 1 - Wednesday 21st February 2024

08:00	Registration - Browse the Posters and Exhibition Stands		
09:00	Introduction	Dr Tim Phillips, innoLAE 2024	Welcome to Day 1
09:10	Session 1	Gold Sponsor Presentation - LinkZill	
09:20	Keynote 1	Prof Jonathan Rivnay, Northwestern University	Organic mixed conductors for bioelectronics
10:05	Break - Sponsor Exhibitions & Posters		
10:35	Session 2	Manufacturing I	Session 3 Bioelectronics I
	2.1	Prof Thomas Anthopoulos, University of Manchester (Invited) Nanomanufacturing paradigms for sustainable large-area electronics	3.1 Prof Fabio Cicoira, Polytechnique Montreal (Invited) Self-healing, stretchable and recyclable electronics
	2.2	Mariana Cortinhal, Universidade NOVA de Lisboa Multilayer gate dielectrics deposited by atomic layer deposition for low-temperature and low-voltage oxide thin-film transistors	3.2 Dr Scott Keene, University of Cambridge Mixed ionic-electronic transport in conjugated polymers for bioelectronics
	2.3	Dr Prakash Karipoth, University of Leeds Direct writing of strain sensors on soft robots with aerosol jet printing	3.3 Dr Ying Fu, University of Strathclyde Development of bioelectronics for highly sensitive detection of biomarkers
	2.4	Catarina Ribeiro, University of Minho Printed electronics using fused filament fabrication for thermoforming applications	3.4 Prof Dr Jean Manca, X-LAB / Universiteit Hasselt Biological nanofibers towards biodegradable electronics and e-biologics
	2.5	Dr Zixin Wang, IDTechEx Technologies and markets of 3D/additive electronics	3.5 Ruben Ruiz-Mateos Serrano, University of Cambridge High-density, conducting polymer electrode arrays for advanced cardiac disease diagnosis
12:40	Lunch - Sponsor Exhibitions & Posters		
14:00	Session 4	Gold Sponsor Presentation - Paragraf	
14:10	Keynote 2	Prof Alberto Salleo, Stanford University	Ions, electrons and polymers: fast ion insertion towards GHz iontronics
14:55	Break - Sponsor Exhibitions & Posters		
15:25	Session 5	Novel Devices & Systems I	Session 6 Bioelectronics II
	5.1	Prof Sayani Majumdar, Tampere University (Invited) Low-thermal budget ferroelectric devices for neuromorphic computing and adaptive sensing	6.1 Simon McMaster, Footfalls & Heartbeats (Invited) Knitting the future
	5.2	Prof Cecilia Mattevi, Imperial College London (Invited) A platform of 3D printed energy storage devices to power wearable sensors	6.2 Dongxun Lyu, University of Cambridge Exploring Ion gating of conducting polymer PEDOT:PSS by Operando NMR Spectroscopy
	5.3	Carme Martinez-Domingo, Institut de Ciencia de Materials de Barcelona Ultrahigh sensitive direct X-ray detectors employing transistors based on a fully organic small molecule semiconductor/polymer blend active layer	6.3 Prof Sahika Inal, King Abdullah University of Science and Technology (KAUST) (Invited) Responsive polymeric mixed conductors for diagnostics and therapy
	5.4	Dr Sarah-Jane Potts, Swansea University Enhancing the performance of the mesoporous screen-printed layers in printed perovskite photovoltaics through novel rheological analysis techniques	6.4 Faustyna Brańko, IQ Biozoom Ink-jet printed thin-film transistor for a non-invasive glucose monitoring device
	5.5	Bowen Liu, Tsinghua University A 1024-channel neurostimulation system enabled by organic thin-film transistors with high uniformity	6.5 Jon Harwell, University of Glasgow Transfer printing for fully biodegradable PCBs with ultralow sheet resistance and narrow track width
17:30	Networking Reception with drinks & snacks		
19:00	Walk across the road to The Hall		
19:20	Gala Dinner		
22:00	Walk Back To Cripps Court Conference Centre		
	Day 1 Ends		

Day 2 - Thursday 22nd February 2024

09:00	Session 7	Dr Tim Phillips, innoLAE 2024	Welcome to Day 2
09:05	Keynote 3	Prof Ana Claudia Arias, University of California, Berkeley	Tracking nitrogen in soil with printed electronics
09:50	Break - Sponsor Exhibitions & Posters		
10:20	Session 8	Novel Devices & Systems II	Session 9 High Performance Materials I
	8.1	Prof Tina Ng, University of California San Diego (UCSD) (Invited) Reinforced interfaces to realize multifunctional supercapacitors	9.1 Dr Yan Wang, University of Cambridge (Invited) Ultra clean interfaces on two dimensional semiconductors
	8.2	Dr Chiara Labanti, Cambridge Display Technology (CDT) SWIR organic photodetectors for imaging applications	9.2 Prof Martin Heeney, King Abdullah University of Science and Technology (KAUST) Development of conjugated polymers for bioelectronic applications
	8.3	Nishadi Perera, Nottingham Trent University Design and development of micro-pressure sensors embedded textiles	9.3 Prof Henning Sirringhaus, University of Cambridge Effects of processing-induced contamination on organic electronic devices
	8.4	Zixing Peng, University of Manchester Fully printed 2D material-based memristors	9.4 Rebecca Coleman, Paragraf Optimising the fabrication of high-performance graphene Hall effect sensors
	8.5	Prof Sébastien Sanaur, Ecole des Mines de Saint-Etienne Contact resistances in short channel organic electrochemical transistors	9.5 Prof Francisco Molina-Lopez, KU Leuven Laser-printed bismuth telluride-based ultraflexible thermoelectrics for the IoT
12:25	Lunch - Sponsor Exhibitions & Posters		
14:00	Session 10	Sponsor Presentation	
14:10	Keynote 4	Dr Carl Naylor, Intel	Is the future 2D?
14:55	Break - Sponsor Exhibitions & Posters		
15:25	Session 11	Manufacturing II, High Performance Materials II and Novel Devices & Systems III	Session 12 Applications and Sustainability & Energy Efficiency
	11.1	Prof Beatrice Fraboni, University of Bologna (Invited) Large area flexible detectors for real-time dose monitoring during radio/proton therapy	12.1 Dr Eleonora Macchia, Åbo Akademi University (Invited) Single-molecule bioelectronic sensor: improving reliability with machine learning approaches
	11.2	Pedro Moreira, NOVA School of Science and Technology (FCT-NOVA) Inkjet printing of non-critical raw materials for thin film transistor application	12.2 Dr Hugh Glass, Paragraf Mapping current in battery systems using graphene Hall effect sensors
	11.3	Francis Lockwood Estrin, University College London Single-step printed circuitry deposited via Atmospheric Pressure Plasma Jet (APPJ)	12.3 Dr Quentin Jeangros, CSEM Large-area perovskite thin films for energy harvesting, lighting and visual light communication
	11.4	Matthew Spink, Nottingham Trent University Laser annealing and infra-red spectroscopic ellipsometry: promising alternatives for manufacturing and quality control for LAE	12.4 Harry Delalis, FlexEnable Enhancing augmented reality with flexible liquid crystal dimming technology
	11.5	Dr Stefano Pecorario, University of Cambridge Enhancing charge transport in Sn-based halide perovskites thin films for high-mobility field-effect transistors and thermoelectrics	12.5 Dr Tim Mortensen, Haydale Talk title to be confirmed
17:30	Session 13	Speaker Prize Sponsored by LinkZill Poster Prize Sponsored by Paragraf with prizes supplied by The Royal Society of Chemistry	
17:50	Conference Ends		

Sponsor innoLAE 2024

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 conference literature, including the downloadable conference programme given to all delegates

Platinum

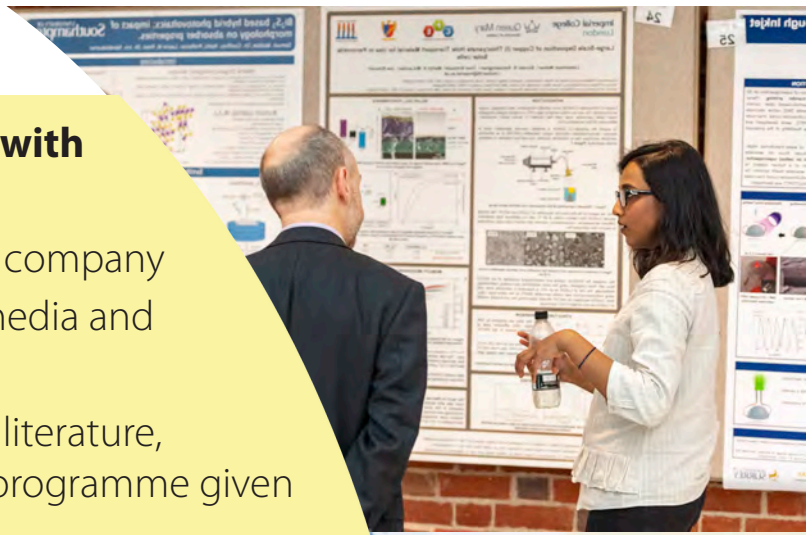
£4,495 (+VAT) One package available

- Double size table top display space in exhibition area
- Speaker/presentation slot (20 minutes) in main conference
- 4 complimentary delegate places
- Additional representatives at reduced registration rate
- Promotion of company as speaker prize sponsor
- Distribution of company brochure in delegate bag
- Specific platinum sponsor logo visible on all banners
- Company logo on delegate name badges
- Acknowledgement by conference chair
- Full page advertisement in the event brochure
- Company profile in email sent to all attendees
- Sponsored blog article on event website

Gold

£3,295 (+VAT) Three packages available

- Double size table top display space in exhibition area
- Sponsor presentation slot (10 minutes) in main conference
- 3 complimentary delegate places
- Additional representatives at reduced registration rate
- Promotion of company as poster prize sponsor
- Distribution of company brochure in delegate bag
- Acknowledgement by conference chair
- Full page advertisement in the event brochure
- Company profile in email sent to all attendees
- Sponsored blog article on event website





Silver

£2,195 (+VAT) Limited packages available

- Table top display space in exhibition area
- Sponsor presentation slot (5 minutes) in main conference
- 2 complimentary delegate places
- Additional representatives at reduced registration rate
- Acknowledgement by conference chair
- Full page advertisement in the event brochure
- Company profile in email sent to all attendees
- Sponsored blog article on event website



Bronze

£975 (+VAT)

- Table top display space in exhibition area
- 1 complimentary delegate place
- Additional representatives at reduced registration rate
- Half page advertisement in the event brochure
- Company profile in email sent to all attendees



Additional sponsorship options

Delegate Bag Sponsorship

£1,250 (+VAT) One package available

Logo printed alongside the conference logo on the event bags given to all attendees

Lanyard Sponsorship

£995 (+VAT) One package available

Logo printed onto the name tag lanyards given to all attendees



Delegate Bag Insert

£250 (+VAT) Limited packages available
Ensure your marketing material is received by each conference attendee

Conference Programme Advertisement

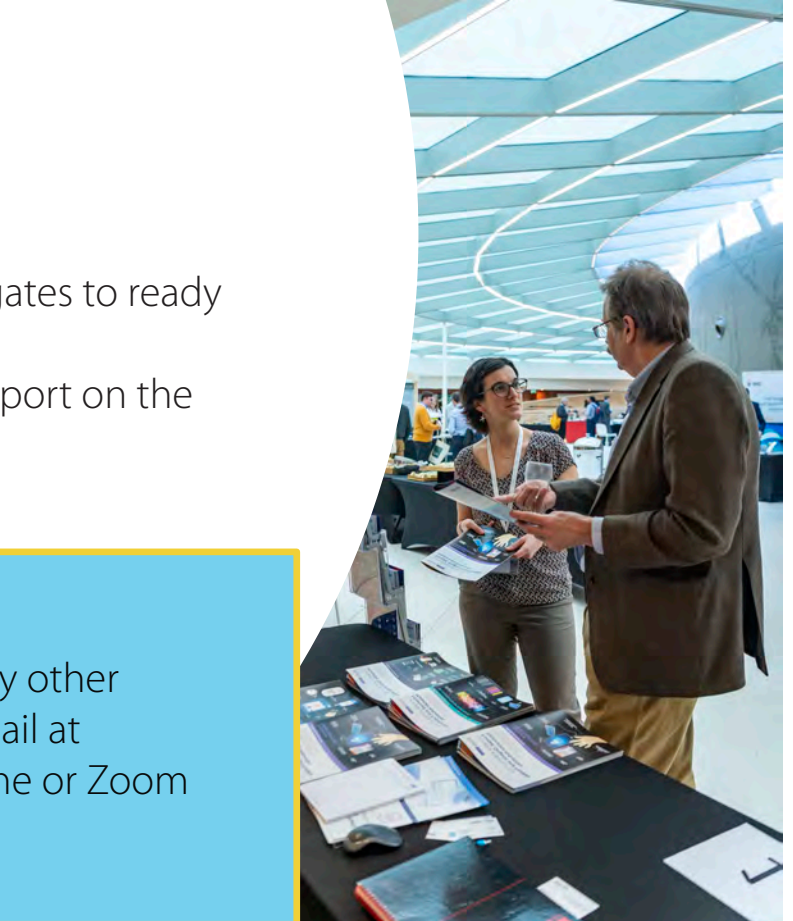
£250 (+VAT) Limited packages available
Display a full page colour advertisement within our conference programme received by all conference attendees (also available online)

Literature Table

Attendees: £100 (+VAT)
Non-Attendees: £200 (+VAT)
Make your literature available for delegates to ready throughout the conference
Display a company leaflet/brochure/report on the literature table in the registration area

Interested in being a Sponsor?

To discuss sponsorship packages or any other requirements please contact us via email at info@innolae.org to arrange a telephone or Zoom meeting.



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We look forward to hearing from you!

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