



LUX showcases new tech at latest quarterly meet

A first-ever Tech Showcase was the highlight of the LUX Photonics Consortium 2018 3rd Qtr Networking & Technical Talks, held at NTUitive's new Innovation Centre on 25 September and attended by 68.

Aside from LUX Industry and Faculty members, the guests included George Loh and Tiaw Kay Siang, the Director and Deputy Director of Programmes at the National Research Foundation Singapore, and Guy Belanger, Trade Commissioner

(ICT - ASEAN Lead) at the High Commission of Canada to Singapore.



The LUX Photonics Consortium 2018 3rd Qtr Networking & Technical Talks saw a strong showing.

Message from the Chairman/Co-director:

During our September quarterly networking event held at the new NTUitive premises, LUX welcomed eight new industry members, taking the total number of industry members to 49. It is gratifying to see LUX growing not only in numbers, but also more importantly, continuing to attract MNCs and local SMEs such as KLA-Tencor and Precision Laser Solutions, which recognise the value of the consortium. Similarly, the number of LUX faculty members has grown to 54 and currently cover a wide range of photonics research, from upstream science such as nanophotonics, metamaterials and silicon photonics to downstream applications such as biomedical imaging and sensing, optical coating and film materials as well as various laser types for defence and industrial uses. LUX will continue to strive to introduce innovative technologies from our faculties for industry adoption. Some of these technologies were showcased at the recently concluded TechInnovation and Industry Transformation Asia-Pacific (ITAP) exhibitions.

The consortium has also been expanding its network to the Europe and North America regions by hosting the French and Canadian delegations in Singapore. Early discussions are underway to have MOUs with both clusters. We hope that these exchanges can generate more business opportunities and expose the local photonics and optics industry to global photonics clusters and value chains. Members are encouraged to actively participate in these events to capitalise and leverage on these networks.

There have been several positive developments at TPI as well. Two new faculty members, Prof Chen Yu-Cheng, whose research interests are in bio-lasers, and Prof Kim Munho, whose expertise is in semiconductor and flexible optoelectronic devices, have joined VALENS and COEB respectively. CDPT is expanding to include two state-of-the-art facilities – a sophisticated molecular epitaxial system for chalcogenides and an alloy probe standing system for working with different ions. Some of the centres are in the midst of submitting new grant applications – COFT on distributed fibre sensors for concrete strength measurement, COEB on tunable metasurfaces and LUMINOUS! on UV technology for LEDs.

This newsletter issue will be the last for the year. With festive seasons and year-end holidays around the corner, I would like to take this opportunity to wish everyone happy holidays and a great year ahead.



Christian Wolters, Systems Engineering Manager (centre), with his KLA Tencor colleagues Dengpeng Chen, Senior Engineering Manager (right) and Thomas Wee, HR Manager (left)."

Presenting seven exciting technologies – Solar Absorber Based Water Purification System, Benchtop Mini Fibre Preforms Fabrication System, Fully Automated Precision Micro-Welding with Pulsed Lasers, Detection of Diabetic Foot with Infrared Thermography, Active Smart Window with Voltage Tunable Microwrinkles, Noninvasive Portable Photoacoustic Sensor for Glucose and Blood Core Temperature Measurement, Miniature Spectrometers – that had

been shared at the TechInnovation 2018 at Marina Bay Sands, the Tech Showcase was a chance for members who missed the exhibition to get up close and personal with these technologies.

The event also saw five LUX Faculty Members delivering **Faculty Talks** that provided a glimpse of exciting developments to come:

- Nano-materials for Thermal based applications by Assoc Prof Edwin Teo
- Integration and Qualification of Technology for Intelligent Manufacturing with Lasers by Assoc Prof Zhou Wei
- Thulium doped Fibre Lasers by Dr Lai Wenn Jing
- k.p platform for semiconductor simulation by Assoc Prof Fan Weijun
- Advances in Glasses-free 3D Display by Assoc Prof Zheng Yuanjin



Member companies find out more about Miniature Spectrometers, one of seven technologies at the Tech Showcase. The portable spectrometers can operate in the IR spectrum at low-cost.

In addition, eight new **Industry Members** were introduced:



CYBERNET SYSTEMS TAIWAN, which provides digital solutions in areas like Computer Aided Engineering and Optical Solutions Software.



Huawei, a leading global provider of information and communications technology (ICT) infrastructure and smart devices. It provides integrated solutions across four key domains – telecom networks, IT, smart devices, and cloud services.



KLA Tencor Corporation, a leading provider of process control and yield management solutions, which partners with customers globally to develop leading inspection and metrology technologies that serve the semiconductor, LED, and other related nanoelectronics industries.



MERIDIAN Innovation, a fabless semiconductor startup, incorporated in Singapore. It develops cost-effective and high-performance Thermal Imaging Sensor-based solutions for commercial applications.



PLC Industries, a service provider in the high-precision engineering arena, which provides innovative technologies for Photonic, Biomedical, Imaging and Laser applications.



Precision Laser Solutions, which delivers total solutions to manufacturing industries with in-house design and fabrication teams in automation and laser machine hardware and software.



Wavelength Opto-Electronic, which has strong capabilities in the design and customization of lasers and optics products and solutions.



WEO Corporation, which provides a complete engineering solution, ranging from design to manufacturing of single optical components and development of opto-mechanical assemblies.

Delegation Visits

Bonjour! French delegation gets a warm welcome from LUX

As part of the France-Singapore Year of Innovation 2018, LUX hosted a French delegation comprising 10 organisations from 22 to 25 October.

The International Partnership Mission of French Optics & Photonics Competitiveness Clusters delegation was in town to meet with potential Singaporean partners of the sector, develop industrial and technological partnerships, share expertise, and discuss R&D projects.

The visit was jointly organised by the Embassy of France in Singapore, its trade commission, Business France, as well as French photonics cluster OPTITEC, which coordinates the mission of meeting potential technological and industrial partners.

Day One saw the delegation visit the Singapore Economic Development Board (EDB), hosted by Mr Lionel Lim, Head of Precision Engineering, where they were given an overview of EDB and presented with the photonics landscape in Singapore. At National Research Foundation (NRF), the delegation were joined by the Ambassador of France to Singapore, His Excellency Mr Marc Abensour, and NRF CEO, Professor Low Teck Seng. They were introduced to the RIE2020, a 5-year strategic plan for Research, Innovation and Enterprise in Singapore.



The Ambassador of France to Singapore, His Excellency Mr Marc Abensour (10th from right), and NRF CEO, Professor Low Teck Seng (9th from right), together with the delegation.

The second day saw the Franco-Singaporean Optics-Photonics Forum take place, with 9 LUX member companies and 1 LUX faculty member presenting. They are: Denselight Semiconductors, JPT Electronics, Palomar Technologies, Precision Laser Solutions, Sintec Optronics, ST Electronics, STELOP, Wavelength Opto-Electronic, WEO Corporation, and Asst Prof Wei Lei, Director of the Centre for Optical Fibre Technology. Via five-minute company pitches from both sides and speed networking meetings, it sought to encourage quality R&D partnerships and project collaborations.

“It was a fruitful session for us to meet the French companies and explore potential areas of collaboration. I hope that LUX can organize more of such events in the future,” said Dr Wu Naien, CEO of Precision Laser Solutions.



The Ambassador of France to Singapore, His Excellency Mr Marc Abensour, speaking to the forum participants.

The penultimate day was packed with insightful visits to the Agency for Science, Technology and Research, photonics manufacturer and LUX member company Coherent, and The Photonics Institute and its associated centres: Centre of Excellence for Semiconductor Lighting & Displays, Centre for Optoelectronics & Biophotonics, Centre for Optical Fibre Technology, Centre for Disruptive Photonic Technologies, Centre for Optical & Laser Engineering.



French delegation group photo at The Photonics Institute



The delegation then adjourned to NTU's iconic and innovative eco-friendly learning hub, The Hive, for networking, over a French staple: wine.

Said Quentin Mocaer, Segment Line Manager of Amplitude Laser: "This delegation was a great way to meet the key Singaporean actors in photonics, and LUX's deep knowledge of the ecosystem was of huge help."



LUX members and French delegation networking at the Hive.

Semiconductors, provider of one-stop design and manufacturing solutions and a Singapore-based division of POET Technologies. They also engaged in business exploration meetings with a carefully selected group of researchers and companies, including DSO National Laboratories.

With the French photonics sector comprising over 1,000 companies with a consolidated global turnover of EUR\$12.45 billion, or 13.5% of the European industry, it is certainly hoped that this visit will have meaningful implications for the local photonics sector.

Before bidding au revoir to Singapore, the French delegation made the trip to another LUX member company, DenseLight

About the delegation

The 10 French organisations comprised seven companies and three (of five) France photonics clusters. Benefitting from the strong support of the French government, these clusters seek to promote the sector among national and European partners and institutions, and provide support in bridging the gap between the R&D and commercial development of SMEs.

Clusters



ALPHA RLH: A photonics and hyper frequency hub in the region of New Aquitaine



OPTITEC: European cluster in complex optics and imaging systems dedicated to medical technologies, smart cities, industries of the future and security & defence applications



PHOTONICS BRETAGNE: A photonics innovation hub in the region of Brittany

Companies



AMPLITUDE LASER: A manufacturer of ultrafast lasers for scientific, medical and industrial applications



AUREA TECHNOLOGIE: A designer and manufacturer of high-performance photon counting, picosecond laser and timing optical instruments



FLASHLAMPS VERRE & QUARTZ: A glass working company specialising in the manufacture of high-performance xenon-discharge lamps



STIL Sensors - Sciences & Techniques Industrielles de la Lumière: A leader in high-performance, high-resolution optical sensors



SYMETRIE: A leading provider of hexapod solutions for positioning and motion applications



THALES LAS France: A provider of high-energy laser solutions for a range of applications in the fields of industry, medicine, science and space

Canadians explore Singapore photonics scene

From 24 to 26 October, LUX hosted a Canadian delegation who wished to learn more about the ecosystem of optics and photonics in Singapore.

The Canadian visit was driven by Ms Lysanne Picard, International Affairs Advisor, Ministry of Economy, Science and Innovation of Quebec, and Ms Marie-Christine Ferland, General Manager, Pole for excellence in optics-photonics – Optonique, which seeks to invigorate Quebec's optics-photonics ecosystem.

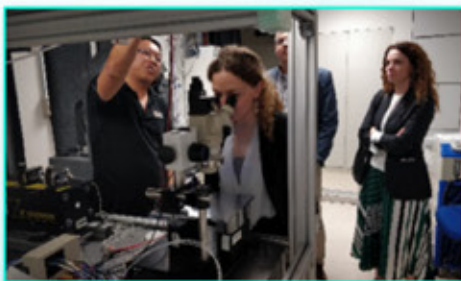
There were also representatives from the High Commission of Canada to Singapore and Optech (a college centre for technology transfer in optics/photonics).

The strong presence from Quebec is not surprising, given that it is Canada's leading province for optics-photonics according to Optonique, Quebec's pole of excellence in optics-photonics, which was launched by government representatives on 5 September last year. Optonique's website (<https://optonique.ca/en/>) states that a quarter of the country's optics-photonics industry is located in Quebec, with the region generating over \$800 million in sales and employing over 7,500.

The three-day visit saw the delegation visit the Agency for Science, Technology and Research, and The Photonics Institute associated centres: Centre of Excellence for Semiconductor Lighting & Displays, Centre for Optoelectronics & Biophotonics, Centre for Optical Fibre Technology, Centre for Disruptive Photonic Technologies, and Centre for Optical & Laser Engineering.

They were also warmly welcomed at the premises of LUX industry member Sintec Optronics.

With this successful visit, the path is well-lit for future Singapore-Canada photonics collaborations.



The Canadian delegation visited multiple facilities, including that of The Photonics Institute and LUX Industry Member Sintec Optronics, and learnt more about the work being done in the local photonics scene.

Industry News

Nanoveu lists on ASX and received in-principal award for Industry Alignment Fund – Industry Collaboration Projects (IAF-ICP) with NTU

LUX member company Nanoveu – a provider of thin film-based nanostructures that shape vision when viewed through high-resolution smart devices – completed a successful listing on the Australian Securities Exchange in November 2018.

Nanoveu's key product is the EyeFly3D, a smartphone screen protector that works together with an app to allow users to view purpose-shot 3D content on high-resolution mobile phones and tablets without using 3D glasses. It also enables users to shoot 3D photos and videos and convert 2D content to 3D.

Despite looking like your average smartphone screen protector, the EyeFly3D screen contains microstructures – measured in nanometres – that act as an array of lenses and allow the eyes to perceive as 3D side-by-side images shown through the app.

With the Initial Public Offering completed, Nanoveu will step up manufacturing and marketing of the EyeFly3D. It is targeting to sell 358,000 units in the first 12 months and three million in 2020.

Nanoveu also recently signed an agreement with NTU to develop its EyeFyx product to commercialisation, with the co-funding from IAF-ICP.

EyeFyx, which is targeted for market release within 18 to 24 months, will enable users with common vision defects to view their smartphone or tablet without their glasses. Its nanoimprint lens work alongside embedded software to achieve a clear image on the user's retina.

While initially focusing on correcting farsightedness, the technology can potentially be applied to short-sightedness and astigmatism too in future.

With the aging population and increasing use of digital technology, Nanoveu sees great potential for its EyeFyx technology. It might also have implications for developing countries, where the poor cannot afford to visit optometrists.



Australian Financial Review spoke to Nanoveu Chief Operating Officer David Symons on the company's plans for EyeFly3D and EyeFyx.

SilTerra seeks slice of Life Sciences pie

LUX member and award-winning Malaysian semiconductor company SilTerra organised the Semiconductors in Life Sciences Symposium on 18 September. The event was held at MedTech hub Penang.

The event brought together industry leaders, thought leaders and academics from the life sciences and nanotechnology fields and is part of SilTerra's efforts to shape an ecosystem to support the development of life sciences in Malaysia and within the region.

While SilTerra specialises in nanotechnology and manufactures microchips, it has a strong understanding of life sciences technologies thanks to its 15 year partnership with imec, a leading R&D and innovation hub active in nanoelectronics and digital technologies.

Said Tan Eng Tong, SilTerra's Vice President of Strategic Management: "By organising this symposium, we hope to accelerate collaboration between manufacturers and healthcare professionals to engage in new innovative ways to propel health technology in Malaysia to the next level."

SilTerra sees great potential in the Life Sciences market, which they expected it to grow in value from US\$9.4 billion in 2016 to US\$26 billion by 2023 with a compound annual growth rate of 15.3 percent.

Potential profits aside, the integration of biology and nanotechnology could also enable healthcare to be digitalised in more portable and affordable devices like smartphones.

For instance, SilTerra is developing biosensors that can be incorporated into Internet of Things and point-of-care devices, some of which may be many times smaller than traditional lab equipment. These can help detect and diagnose microorganisms, pathogens, virus, bacteria, and, eventually, diseases such as dengue, malaria and cancer, without a long wait for lab results.



LUX faculty member Assoc Prof Tan Chuan Seng presented at the Life Sciences Symposium on 'A Compact and Low Cost Molecular Sensing Platform with Germanium Photonics'.



SilTerra management and symposium speakers at the first-in-Asia Semiconductors in Life Sciences Symposium on 18 September, organised by SilTerra.

Local Exhibitions

Exhibitions shine the spotlight on LUX

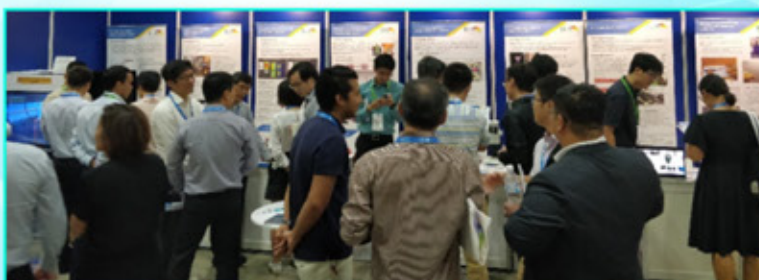
The third quarter of 2018 proved a fruitful one for the LUX Photonics Consortium as it participated in TechInnovation 2018 and Industrial Transformation Asia-Pacific 2018.

TechInnovation, held at the Marina Bay Sands from 18 to 19 September, is a technology-to-industry matching event organized by IPI Singapore (Intellectual Property Intermediary Singapore).

It brings together international technology providers and enterprises to accelerate the commercialization of emerging technologies, seed licensing and collaborative opportunities, as well as foster open innovation collaborations.

This year's event saw the focus on the following technology themes: services & digital economy; urban solutions & sustainability; health & personal care; advanced manufacturing & engineering; food innovation; and logistics & transport innovation.

The LUX booth, which showcased eight exciting new technologies, was a success with large crowds gathering to learn more about these technologies via interactive demos.



LUX booth was crowded with visitors to learn more about the new technologies.



Asst Prof Lau introducing his technology to the visitors.

The eight technologies presented were:

Solar Absorber Based Water Purification System: This full-solar-spectrum solar absorber absorbs more than 96% solar energy with thermal emittance of approximately 4% at 100°C and can produce directly drinkable water from seawater and contaminated water.

Benchtop Mini Fibre Preforms Fabrication System: This system enables low-cost, fast and flexible fibre sample fabrication. It is suitable for rapid prototyping or recipe pathfinding for specialty optical fibres and fibre companies or research institutes who are developing specialty fibres.

Fully Automated Precision Micro-Welding with Pulsed Lasers: This machine uses advanced pulse lasers to minimise distortion or thermal damage and is able to weld previously non-weldable materials, especially dissimilar materials such as stainless steel and Inconel.

Detection of Diabetic Foot with Infrared Thermography: A computer aided detection (CAD) system using plantar foot thermograms, its image processing methods have yielded 89.39% accuracy using only five nonlinear features. This system allows medical practitioners to conveniently measure and evaluate each diabetic's foot condition in a systematic manner using a non-subjective algorithm.

Materials for Printed Electronics – AgNW and Copper inks: A range of conductive inks that enable the fabrication of flexible electronics on plastic substrates, the technology provides cost savings compared to incumbent technology.

Active Smart Window with Voltage Tunable Microwrinkles: A cost and power effective smart window that switches between clear and frosted by microwrinkling of sun-screen thin film on elastomer membrane. This technology has excellent tunability with a much wider range of transparency tuning between 81% to 1.85% transmittance.

Noninvasive Portable Photoacoustic Sensor for Glucose and Blood Core Temperature Measurement: This wearable technology allows for noninvasive, continuous monitoring and can help prevent long-term complications like cardiovascular disease, kidney and eye problems.

Miniature Spectrometers: This portable spectrometer is capable of operation at IR spectrum at low-cost and is less sensitive to positioning errors and external disturbances compared with FTIR spectrometers.

The latter three technologies were also shortlisted for the Crowd Pitching Platform, which provided an avenue for exhibitors to showcase their technologies and secure commercialisation and co-development opportunities.

In addition, Prof Chen Tupei also showcased his Transparent Display Films technology at the event. This innovation could have meaningful applications such as enabling virtual and real performers to perform on the same stage, or displaying a patient's organs during a surgical operation.

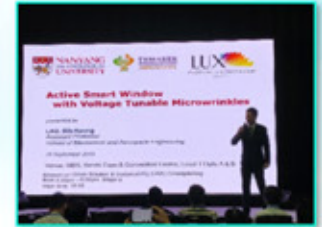
16 to 18 October saw LUX support and participate in the Industrial **Transformation Asia-Pacific** exhibition held at the Singapore Expo. The event sought to help companies in the region start, scale and sustain their adoption of Industry 4.0 processes and solutions, by bringing together the ecosystem of stakeholders across the value chain.

LUX industry members Sintec Optronics and Precision Laser Solutions were part of the LUX presence, while four faculty members were also there to showcase their technologies:

- Assoc Prof Tang Dingyuan shared his **Transparent Ceramics** that can be used for optical windows, lens, missile domes, and transparent armour. It is also an excellent gain media for high power solid-state lasers.
- Dr Lai Wenn Jing discussed **High Power Fibre Laser Systems** that can provide high power and efficiency operating at wavelengths of 1 and 2 micrometre (µm). The 1µm ytterbium-doped fibre laser has a power of up to 1 KW for applications such as material processing, while the 2µm thulium-doped fibre laser has a power of up to 100W for medical applications.
- Asst Prof Yoo Seong Woo showcased **Specialty Fibres for High Power Laser Applications**, namely hollow core fibre technology to deliver high power laser beam and short length high power laser fibre technology for all-fiberized laser system. These specialty fibres can be used in laser-assisted additive manufacturing and laser source for 5D data storage.
- Assoc Prof Zhou Wei spoke about **Laser Assisted Manufacturing - Laser Cleaning, Hardening, Cutting, Welding and 3D Printing**, which has brought benefits like improved quality, aesthetics and cost savings. With the combination of a robotic arm, the laser beam with automation could help to increase efficiency and throughput, and even raise the efficacy of certain manufacturing process that cannot be done without precision control.



Qi Yi from NUS presenting on behalf of Assoc Prof Zhou Guangya.



Asst Prof Lau crowd pitching his technology to the audience



Assoc Prof Zheng presenting his technology to the audience.



LUX exhibition booth at ITAP 2018



Group photo of LUX members before the guided tour.

On Day Two, LUX also organised a curated tour of the exhibition for its members and attended by representatives from the National Research Foundation, PLC Industries, Pro-health Water Technologies, GlobalFoundries, Sintec Optronics, as well as NTU faculty.

Technologies showcased

Technologies	Advantages	Applications	Principal Investigators
1. Fully Automated Precision Micro-Welding with Pulsed Lasers	<ul style="list-style-type: none"> Advanced pulse lasers to minimize distortion or thermal damage Able to weld dissimilar materials such as stainless steel and Inconel 	<ul style="list-style-type: none"> Aerospace manufacturing and remanufacturing Medical devices Flexible electronics 	Assoc Prof Zhou Wei, NTU
2. Solar Absorber Based Water Purification System	<ul style="list-style-type: none"> Absorbs →96% solar energy with thermal emittance of ~ 4% at 1000C Able to produce directly drinkable 	<ul style="list-style-type: none"> Purification of seawater Purification of contaminated water 	Assoc Prof Tupei, NTU
3. Transparent Display Films	<ul style="list-style-type: none"> Able to project video/images under brightly lit environment Low-cost and scalable production 	<ul style="list-style-type: none"> Windows advertisement on trains/bus Heads-up display 	Assoc Prof Chen Tupei, NTU
4. Benchtop Mini Fibre Preforms Fabrication System	<ul style="list-style-type: none"> Compact, low-cost, fast and flexible fabrication 	<ul style="list-style-type: none"> Rapid prototyping or recipe pathfinding for specialty optical fibres 	Dr Lai Wenn Jing, NTU
5. High Power Fibre Laser Systems	<ul style="list-style-type: none"> 1um ytterbium-doped fibre laser of up to 1 KW power 2um thulium-doped fibre lasers of up to 100W power 	<ul style="list-style-type: none"> Material processing such as metals Medical applications such as kidney stone treatment 	Dr Lai Wenn Jing, NTU
6. Detection of Diabetic Foot with Infrared Thermography	<ul style="list-style-type: none"> Fast, non-invasive and non-contact Can be easily programmed and installed in any clinician's laboratory. 	<ul style="list-style-type: none"> An adjunctive diabetic foot screening tool in clinic 	Assoc Prof Ng Yin Kwee, NTU
7. Active Smart Window with Voltage Tunable Microwrinkles	<ul style="list-style-type: none"> Cost-effective Excellent tunability between 81% to 1.85% transmittance 	<ul style="list-style-type: none"> Tunable sun visor Window glass for home and shop 	Asst Prof Lau Gih Keong, NTU
8. Noninvasive Portable Photoacoustic Sensor for Glucose and Blood Core Temperature Measurement	<ul style="list-style-type: none"> Noninvasive monitoring Portable and Wearable 	<ul style="list-style-type: none"> Early warning for abnormal temperature Monitoring health status 	Assoc Prof Zheng Yuanjin, NTU
9. Transparent Ceramics	<ul style="list-style-type: none"> High transparency, no scattering High thermal conductivity, low phonon energy 	<ul style="list-style-type: none"> Optical windows Transparent armours Gain media for high power solid-state lasers 	Assoc Prof Tang Dingyuan, NTU
10. Specialty Fibres for High Power Laser - Hollow core fibre and Short length laser fibre	<ul style="list-style-type: none"> Ultrafast laser delivery and routing High power beam combining and beam delivery All fiberization 	<ul style="list-style-type: none"> Laser assisted additive manufacturing Laser source for superman memory crystal (5D data storage) 	Asst Prof Yoo Seongwoo, NTU
11. Miniature Spectrometers	<ul style="list-style-type: none"> Less sensitive to positioning errors and external disturbances compared with FTIR Facilitates on-site detection and analysis of materials in real-time 	<ul style="list-style-type: none"> Chemical detection and analysis Industrial process control Biomedical point of care testing Food and beverage quality assessment 	Assoc Prof Zhou Guangya, NUS

Awards

She Loves Tech loves d'Optron



d'Optron Pte Ltd, a spin-off company from the NTU Centre for Optical and Laser Engineering and a member of LUX Photonics Consortium, placed first in the **She Loves Tech** pitching competition in Singapore in August. **She Loves Tech** is a global initiative showcasing the convergence of the latest trends in technology, entrepreneurship, innovation, and the opportunities it creates for women.

Co-founded by Prof Anand Krishna Asundi of NTU and Rachel Wang, d'Optron uses artificial intelligence and smart 3D image visioning to improve quality control processes. They won for their Smart Depth Profilometry technology, which allows manufacturers to detect product defects faster, more efficiently and at lower cost.

As compared to other such technologies, d'Optron's does not need to be deployed in hyper-regulated rooms, but can be used on a loud, chaotic, manufacturing floor.

d'Optron won an all-expenses paid trip for two to Beijing, in which they will get to meet mentors, business leaders and the local ecosystem. They will also compete against 14 other start-ups for the **She Loves Tech** global Grand Champion award, as well as have an opportunity to speak at a Women in Tech conference.



Rachel Wang (fourth from right, in white top) represented d'Optron at the **She Loves Tech** pitching competition. Her company had previously also received the prestigious AMA Young Enterprise Award in Germany for its outstanding research and development work.

Industry Membership

[Entrance fee
+ Annual fee]

Associate Membership

[Annual fee]



Opportunity for free non-exclusive IPs for up to 3 years



Conduit to access and facilitate government agencies funding that encourages Industry partnership



Regular networking sessions with the industry and academia



Recruit the best people through job portal in consortium website



Collaborations and partnerships with public research performers



Focal point to access top researchers for advice and consultancy to technical queries



Access to global photonics network



Free publicity and promotion on consortium website



Access to selected Photonics lab facilities at member's rate



Trade and Conference exhibitions and workshops opportunities



Quarterly technology newsletter on what's happening in the consortium and industry

**Join Us
Today!**

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