38th Newsletter of the ITN:

"NExt Generation of Tuneable LASers for optical coherence tomography"

(NETLAS)

led by University of Kent

September 2023

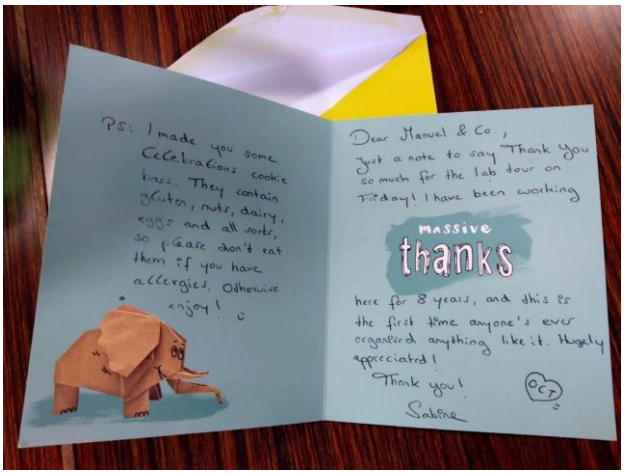
AOG Visits

NATS Technicians visit the Applied Optics Group Labs

On Friday, 15th of September 2023, AOG lab members welcomed our colleagues from technical services from our Division, visiting the labs and discussing the research carried out there. The visit started with a short talk from Dr Manuel Marques, which included a video addressed from the head of the group, Prof Adrian Podoleanu. The visiting group included colleagues from the Physics and the Forensic Sciences teaching labs, in addition to the Science Stores team. They visited the labs of the AOG researchers, with the group's PhD students and post-docs being able to informally explain their area of research and potential applications.

Seeing all the equipment in operation was of particular interest to our Science Stores colleagues, who have handled hundreds of packages containing research equipment for the group in the last few years.

Throughout the visit, the group also had a chance to see some experimental demonstrations, including one where they had the chance to have their fingertips examined with the 1060 nm swept-source OCT system.



We were delighted to welcome them in the group, and even more delighted to receive a lovely message of thanks from one of our colleagues from the Science Stores team, Sabine Hall.

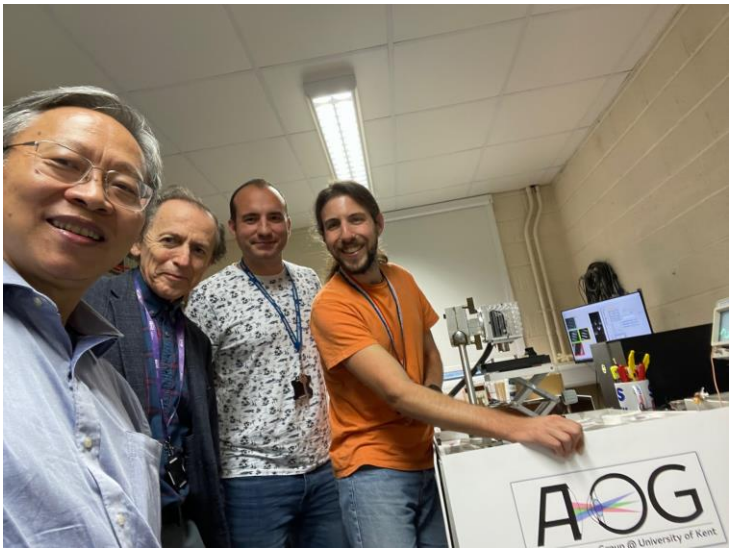
We look forward to continuing the excellent work with them for years to come!

@article by Dr Manuel Marques

AOG Visits

On 27th September 2023 AOG had the privilege to host **Dr. Bo Gu**, Deputy Secretary General *Chinese Optical Society Fellow* **COS/SPIE/OPTICA /LIA** Founder/President/CTO at Bos Photonics

The group's PhD students and post-docs had the chance to show their experiments and explain their area of research and potential applications.



From left to right: Dr Bo Gu, Prof. Adrian Podoleanu, Dr. Radu Stancu and Dr Manuel Marques

Read more about Dr. Bo Gu

[Dr. Bo Gu – 2022 Schawlow Award Recipient – Laser Chirp]

[Business Forum: Industrial laser markets in China - changing and still growing | Laser Focus World]

AOG WELCOME FAIR

On Thursday 21st and Friday 22nd of September 2023, the University of Kent held a Welcome Fair to show the new arrivals what student groups are available to join.

The Optica Student Chapter at Kent held a stall on the behalf of their society with Kent Union on which **they made an optics-themed display,** and spoke to students who were interested.

The members of the chapter, which represented the society on the day, were **AOG PhD Student Lucy Abbott** (president of the Chapter), **NETLAS PhD Student Gopika Venugopal** (secretary) and **AOG PhD Student Julien Camard** (treasurer). There was also support shown by **Dr Manuel Marques** and **Professor Adrian Podoleanu** who came to visit the stall.

The society currently has 10 members. When speaking to potential members, the intentions of the society over the coming year was conveyed; **the society would like to hold an industry visit as well as an academic talk**, as well as the usual socials involving **board games** and expanding their social media to be more educational around **optics topics**.

@article by Lucy Abbott

PUBLICATIONS

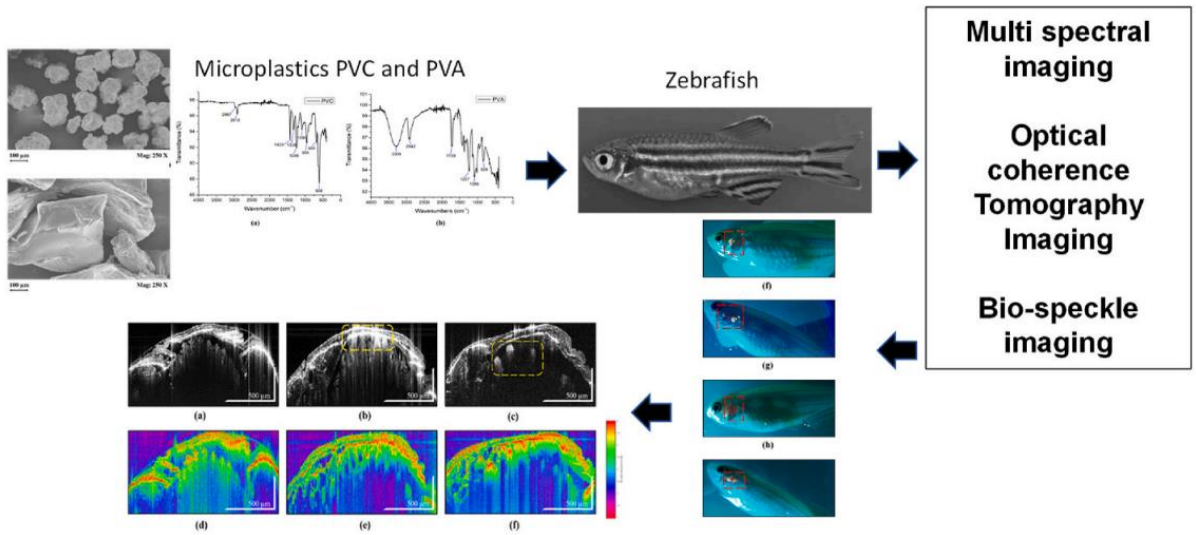
Exploring the impact of PVC and PVA microplastics on zebrafish tissue using multi-spectral imaging, Optical Coherence Tomography (OCT) and biospeckle OCT (bOCT)

Pooja C. Asani, Zoya Alam, Raju Poddar

Chemosphere
Volume 341, November 2023, 140088
https://doi.org/10.1016/j.chemosphere.2023.140088

Studies on Microplastics adsorption in zebrafish using non-invasive, real-time imaging techniques. Multi-spectral imaging to detect dyed Polyvinylchloride and Polyvinylalcohol particles. In-vivo imaging of gills using sweptsource optical coherence tomography (SSOCT). Biospeckle OCT (bOCT) variance analysis to monitor changes in biological activity. Comparison of bOCT variance data to detect changes in microplastics-treated zebrafish

GRAPHICAL ABSTRACT



Discretely Tunable (2594, 2629, 2670 nm) GaSb/Si_3N_4 Hybrid Laser for Multiwavelength Spectroscopy

Samu-Pekka Ojanen, Jukka Viheriälä, Nouman Zia, Eero Koivusalo, Joonas Hilska, Heidi Tuorila, **Mircea Guina**

Laser Photonics Rev.2023, 2300492
First published: 15 September 2023
https://doi.org/10.1002/lpor.202300492

A discrete, tunable photonic integrated laser is showcased for multiwavelength spectroscopy of CO_2, H_2S, and H_2O. The laser combines an AlGaInAsSb/GaSb type-I quantum well-reflective semiconductor optical amplifier with a Si_3N_4 photonic integrated circuit (PIC). Operating at room temperature, the laser emits at 2670.42, 2629.12, and 2594.27 nm, with mW-level average powers. The PIC employs a novel approach for achieving switching between three distinct emission wavelengths by using two cascaded tunable Mach–Zehnder interferometers (MZIs) that are connected to three spiral-shaped narrow-band distributed Bragg reflectors (DBRs). Read More

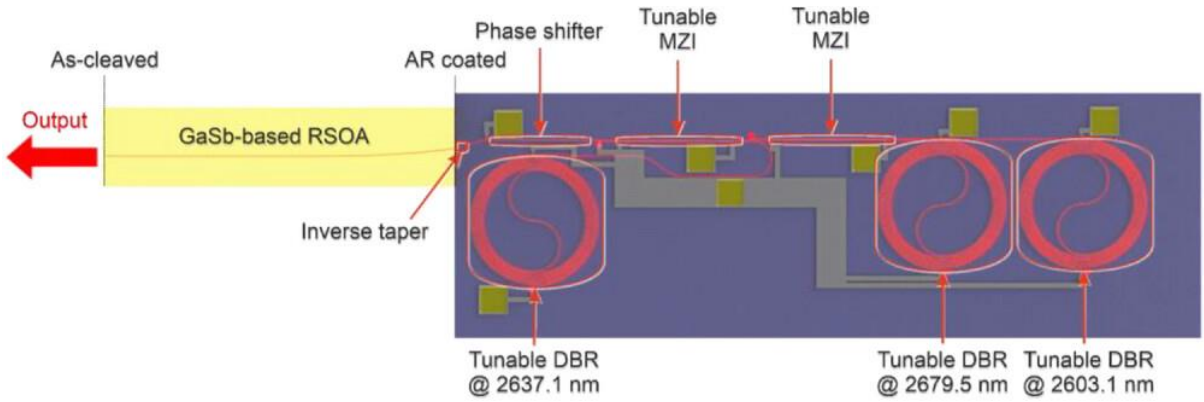


Figure 1: Schematic of the GaSb/Si_3N_4 hybrid MWL demonstrated in this work.

Adaptive balanced detection spectral domain optical coherence tomography

David A. Miller, Roman Kuranov, and Hao F. Zhang

Biomed. Opt. Express 14, 5208-5222 (2023)

https://doi.org/10.1364/BOE.495622

Balanced detection optical coherence tomography (BD-OCT) enables near-shot noise-limited imaging by suppressing wavelength-dependent relative intensity noise (RIN) originating from the light source. In spectral-domain BD-OCT (SD-BD-OCT), the level of RIN suppression relies on the co-registration accuracy of the spectra simultaneously captured by two independent spectrometers. However, existing matching methods require careful pre-calibration using a RIN-dominated dataset or subjective post-processing using a signal-dominated dataset. We developed an adaptive subpixel matching approach, referred to as adaptive balance, that can be applied to any SD-BD-OCT dataset regardless of RIN or signal level without the need for pre-calibration. Read More

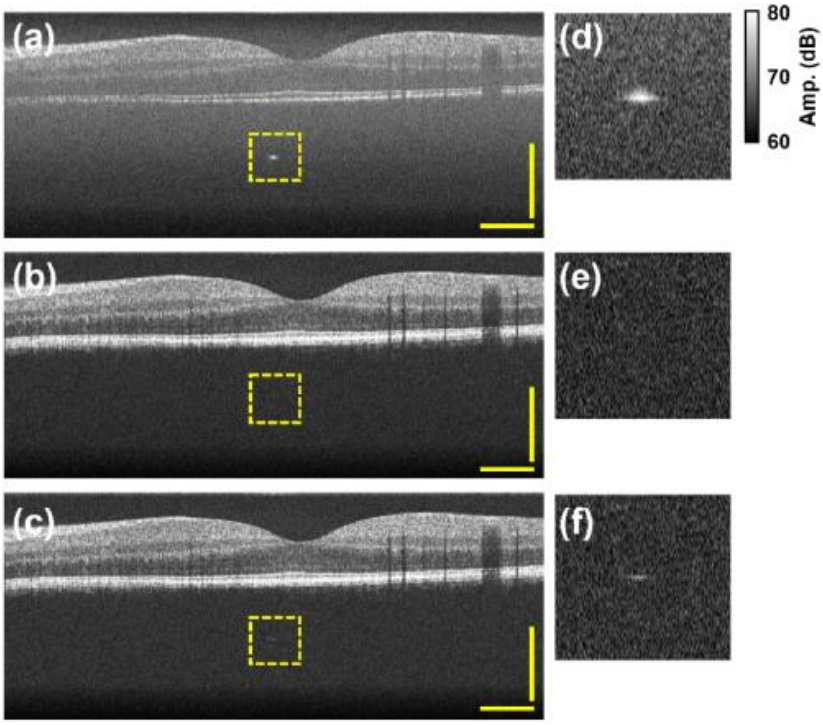


Fig. 7. Human retinal images reconstructed using (a) direct matching, (b) adaptive balance, and (c) pre-calibrated control interpolation vector. Yellow boxes indicate an autocorrelation artifact. (d)-(f) magnified views of regions highlighted in panels a-c, respectively. Bars: 250 µm.

Controlling light propagation in multimode fibers for imaging, spectroscopy, and beyond

Hui Cao, Tomáš Čižmár, Sergey Turtaev, Tomáš Tyc, and Stefan Rotter

Adv. Opt. Photon. 15, 524-612 (2023)

https://doi.org/10.1364/AOP.484298

Light transport in a highly multimode fiber exhibits complex behavior in space, time, frequency, and polarization, especially in the presence of mode coupling. The newly developed techniques of spatial wavefront shaping turn out to be highly suitable to harness such enormous complexity: a spatial light modulator enables precise characterization of field propagation through a multimode fiber, and by adjusting the incident wavefront it can accurately tailor the transmitted spatial pattern, temporal profile, and polarization state. This unprecedented control leads to multimode fiber applications in imaging, endoscopy, optical trapping, and microfabrication. Read More

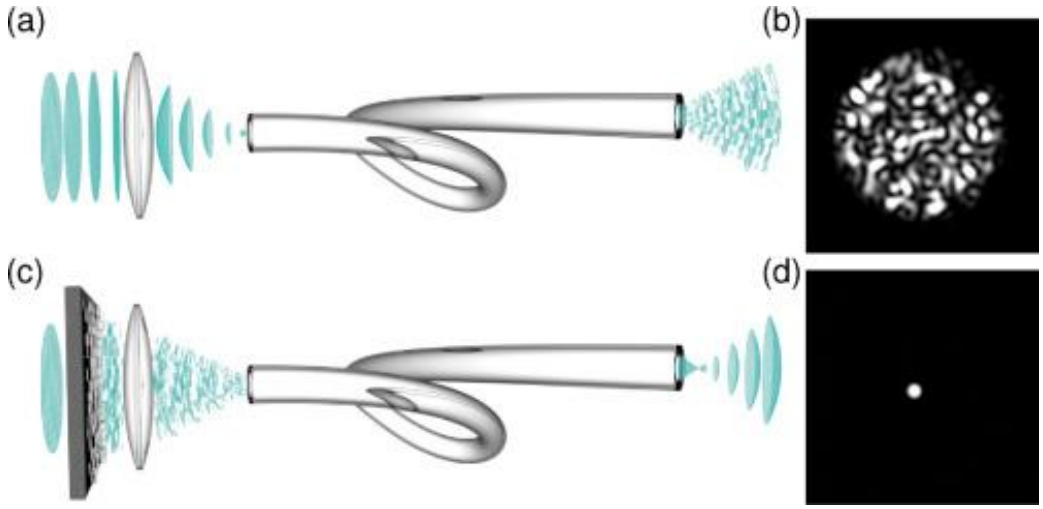


Figure 1. Randomization of light propagating through a MMF. (a) Coherent light coupled into a MMF results in randomized outputs. (b) Typical MMF output signal forming a randomly distributed speckle. (c) Controlled light propagation through a MMF using a spatial modulator of light. (d) Desired output taking the shape of a diffraction-limited focus.

Automated Segmentation of Optical Coherence Tomography Images of the Human Tympanic Membrane Using Deep Learning

Oghalai, T.P.; Long, R.; Kim, W.; Applegate, B.E.; Oghalai, J.S.

Algorithms **2023**, *16*, 445. https://doi.org/10.3390/a16090445

Optical Coherence Tomography (OCT) is a light-based imaging modality that is used widely in the diagnosis and management of eye disease, and it is starting to become used to evaluate for ear disease. However, manual image analysis to interpret the anatomical and pathological findings in the images it provides is complicated and time-consuming. To streamline data analysis and image processing, **we applied a machine learning algorithm to identify and segment the key anatomical structure of interest for medical diagnostics**, the tympanic membrane. Using 3D volumes of the human tympanic membrane, **we used thresholding and contour finding to locate a series of objects**. We then applied **TensorFlow deep learning algorithms** to identify the tympanic membrane within the objects using a convolutional neural network. Finally, we r**econstructed the 3D volume** to selectively display the tympanic membrane. **The algorithm was able to correctly identify the tympanic membrane properly with an accuracy of ~98%** while removing most of the artifacts within the images, caused by reflections and signal saturations. Read More

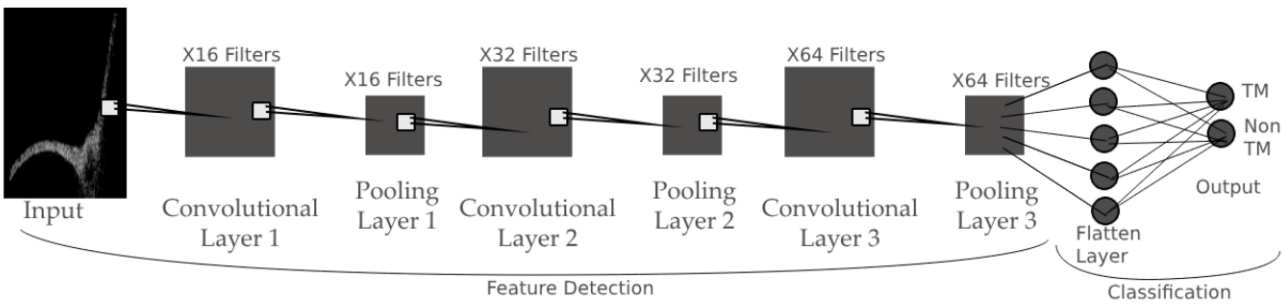


Figure 3. The structure of the convolutional neural network.

Zero-broadening slow light from photorefractive two-wave mixing

Nacera Bouldja, Marc Sciamanna, Alexander Grabar, and Delphine Wolfersberger

Optics Letters, Vol. 48, Issue 18, pp. 4853-4856, (2023)

https://doi.org/10.1364/OL.496327

The ability to delay short light pulses is a promising solution for all-optical telecommunications, but suffers from a large distortion of the delayed pulse as a consequence of the high material dispersion. In this Letter, we demonstrate the possibility to all-optically control the group delay in a photorefractive (PR) crystal by the use of the two-wave mixing (TWM) effect in the pulse regime at room temperature. Most importantly, we show that a proper choice of the pump pulse width in the TWM process enables us to slow down shorter or longer signal pulses without distortion. The technique is demonstrated both at visible (638 nm) and infrared (1064 nm) wavelengths and for slowed-down pulses with durations ranging from 10 ns up to 30 ms, hence confirming its broad applicability. Read More

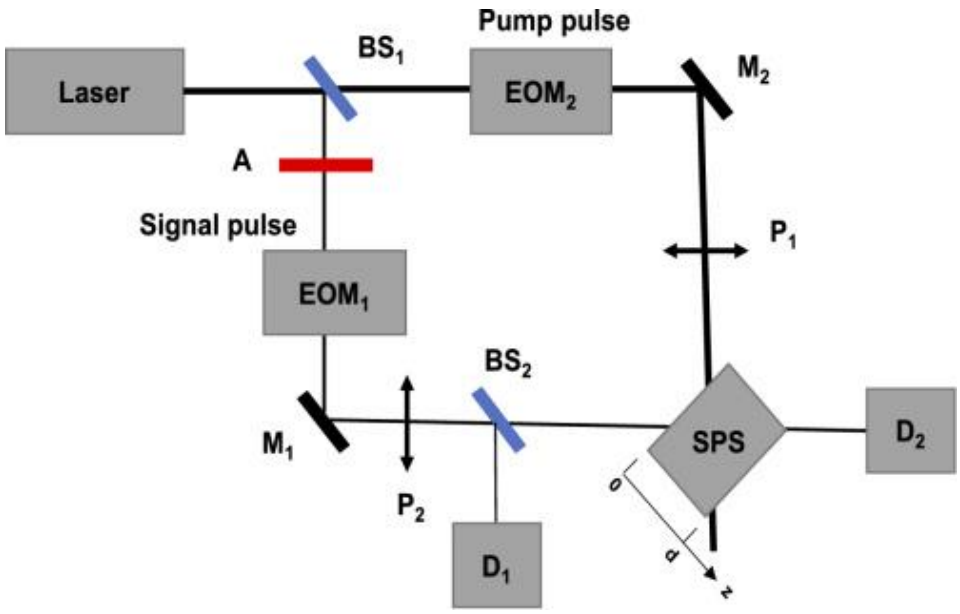


Fig. 2. Experimental setup of the TWM with a pulsed pump: BS1,21,2, beam splitters; EOM1,21,2, electro-optical modulators; P1,21,2, polarizers; D1,21,2, detectors; M1,21,2, mirrors.

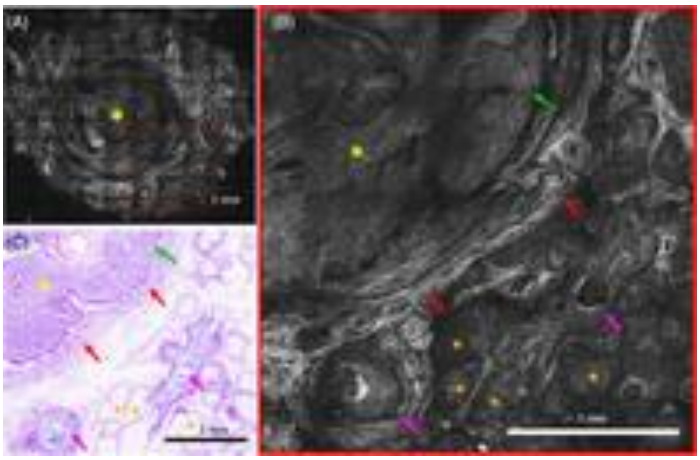
High-resolution full-field optical coherence tomography microscope for the evaluation of freshly excised skin specimens during Mohs surgery: A feasibility study

, Shu-Wen Chang, Kiran Singh, Nicholas R. Kurtansky, Sheng-Lung Huang, Homer H. Chen, Chih-Shan Jason Chen

Journal of Biophotonics, First published: 13 September 2023

https://doi.org/10.1002/jbio.202300275

Histopathology for tumour margin assessment is time-consuming and expensive. **High-resolution full-field optical coherence tomography (FF-OCT) images fresh tissues rapidly at cellular resolution and potentially facilitates evaluation**. Here, we define FF-OCT features of normal and neoplastic skin lesions in fresh ex vivo tissues and assess its diagnostic accuracy for malignancies. For this, normal and **neoplastic tissues were obtained from Mohs surgery, imaged using FF-OCT,** and their features were described. **Two expert OCT readers conducted a blinded analysis to evaluate their diagnostic accuracies, using histopathology as the ground truth.** A convolutional neural network was built to distinguish and outline normal structures and tumors. Of the 113 tissues imaged, 95 (84%) had a tumor (75 basal cell carcinomas [BCCs] and 17 squamous cell carcinomas [SCCs]). The average reader diagnostic accuracy was 88.1%, with a sensitivity of 93.7%, and a specificity of 58.3%. Read More



Ultrasound trapping and navigation of microrobots in the mouse brain vasculature

Alexia Del Campo Fonseca, Chaim Glück, Jeanne Droux, Yann Ferry, Carole Frei, Susanne Wegener, Bruno Weber, Mohamad El Amki & Daniel Ahmed

Nature Communications | (2023)14:5889

https://doi.org/10.1038/s41467-023-41557-3

The authors: **We have introduced ultrasound microrobots into the vasculature of mouse brains for the first time. Really excited about the future possibilities and look forward to developing this technology further for addressing diverse neurological diseases.**

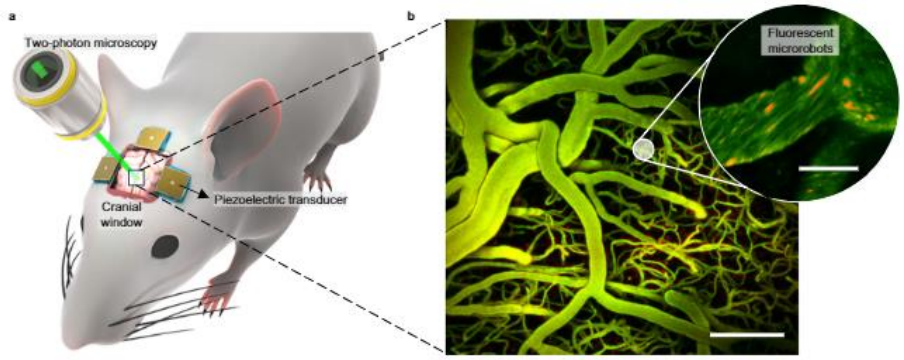


Fig. 1 | Acoustic microrobot navigation combined with real-time optical imaging. a Setup for in vivo studies. Optical access to the brain vasculature for 2P microscopy is provided by a cranial window. Piezoelectric transducers are attached to the skull and introduce acoustic waves directed towards the brain. b Brain vasculature as visualized by 2P microscopy (z-stack projection). Scale bar is 100 µm. In the inset, fluorescent microbubble-based swarms that will form the microrobots are seen in red. A total sample of 200 microbubble clusters and 39 blood vessels were visualized with this technique during the experiments. For a detailed explanation of the image processing, see "Methods". Scale bar is 10 µm.

The intricate and delicate anatomy of the brain poses significant challenges for the treatment of cerebrovascular and neurodegenerative diseases. Thus, precise local drug delivery in hard-to-reach brain regions remains an urgent medical need. **Microrobots offer potential solutions**; however, **their functionality in the brain remains restricted by limited imaging capabilities and complications within blood vessels**, such as high blood flows, osmotic pressures, and cellular responses. Here, **we introduce ultrasound-activated microrobots for in vivo navigation in brain vasculature.** Our microrobots consist of lipid-shelled microbubbles that autonomously aggregate and propel under ultrasound irradiation. We investigate their capacities in vitro within microfluidic-based vasculatures and in vivo within vessels of a living mouse brain. These microrobots self-assemble and execute upstream motion in brain vasculature, achieving velocities up to 1.5 µm/s and moving against blood flows of ~10 mm/s. This work represents a substantial advance towards the therapeutic application of microrobots within the complex brain vasculature. Read More

Updates from *Optics Letters*: editorial

Optics Letters' **Editor-in-Chief** Miguel Alonso provides a **journal update and discusses journal criteria**

For 46 years *Optics Letters* has been fulfilling its mission of publishing high-quality short communications in all areas in optics and photonics in a timely fashion and with no financial barriers for authors. During the period **2020-2022**, *Optics Letters* published in average over **1,600 articles per year**, receiving about **76,500 citations per year**. The journal's **Impact Factor for 2022** is **3.6** and its half-life is 8.4. An example of the importance that *Optics Letters* holds for the optics and photonics community is the fact that **at least 23 Nobel laureates have chosen it to publish their work.**

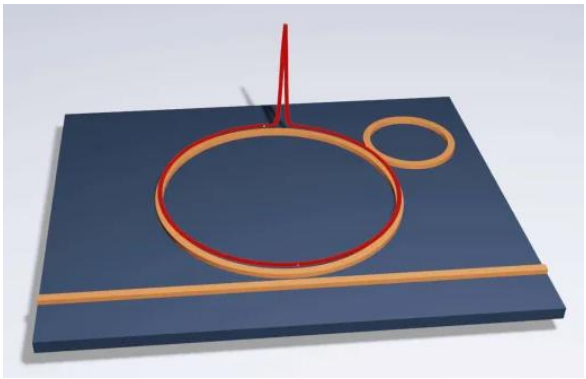
The world is changing constantly, as is the way we do science and share our results. The optics and photonics community becomes more global and diverse every year. *Optics Letters* strives to not only follow this trend but to lead by example. During my tenure, the geographic and gender diversity of the Editorial Board has been a priority. Today, our team consists of an international, **diverse group of 68 Topical Editors, 3 Deputy Editors, and a Features Editor, representing 20+ countries.** I am proud of the strides we have made but I am also aware that there is still work to be done.

Read More to find out some **criteria that must be met for a manuscript to be suitable for consideration in Optics Letters.**

More Efficient Microcombs on Road to Commercialization

GOTHENBURG, Sweden, Sept. 25, 2023 — Researchers at Chalmers University have **developed a method to make microcombs 10 times more efficient**, opening pathways to discovery in space and health care, and paving the way for high-performance lasers in a range of technologies. The team has established a company to commercialize the new technology.

Laser frequency combs can measure frequency with extreme levels of precision, analogous to a ruler made of light. The principle is based on a laser sending photons that circulate within a small cavity — a so-called microresonator — where the light is divided into a wide range of frequencies. These frequencies are precisely positioned in relation to each other, like the markings on a ruler. Therefore, a new kind of light source can be created consisting of hundreds, or even thousands, of frequencies, like lasers beaming in unison.



***The large ring is the micro resonator in which the microcomb is generated**. The **microcomb** is formed by a **pulse of light** (represented by a red spike) and also known as **a soliton that recirculates in the cavity indefinitely**. The smaller ring helps in coupling the light from the straight waveguide, shown at the bottom as a straight orange line, into the bigger ring. In other words, it behaves as impedance matching, and therefore the soliton is generated more efficiently. Courtesy of Óskar Helgason.*

The technology was recently patented and the researchers founded Iloomina AB, a company that will launch the technology onto a wider market. Read More

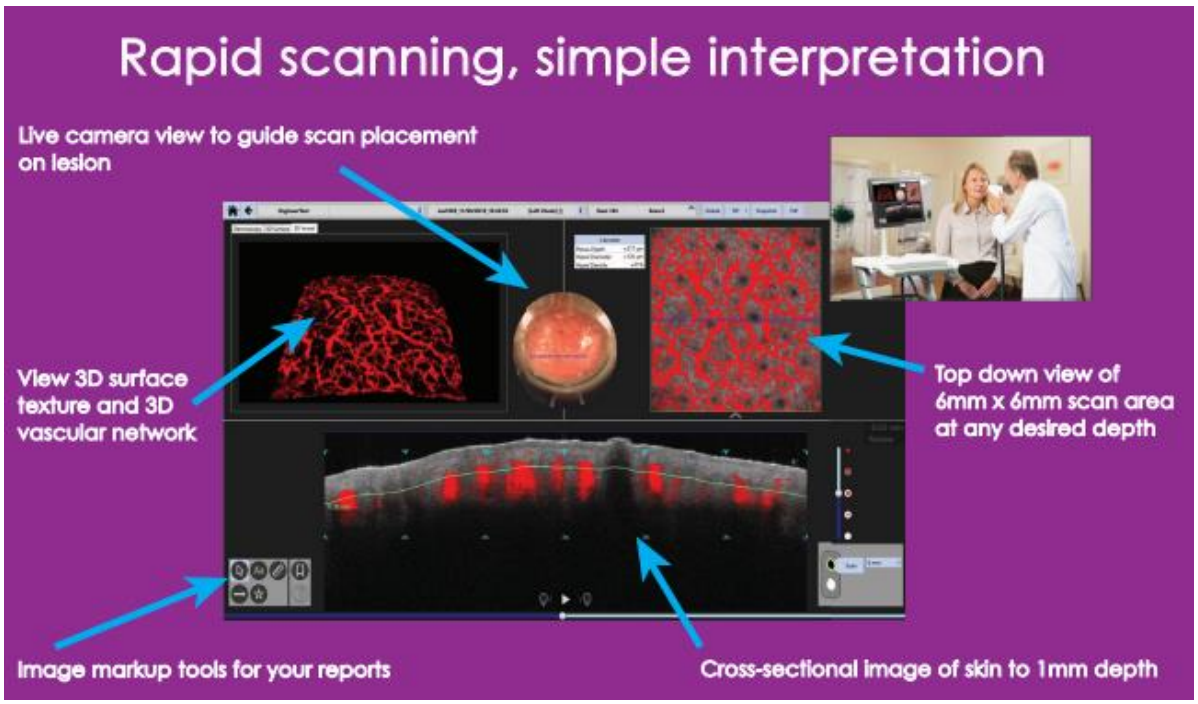
According to Torres-Company, the new microcombs enable high-performance laser technology in numerous markets. “For example, frequency combs could be used in lidar modules for autonomous driving, or in GPS satellites and environmental sensing drones, or in data centers to enable bandwidth-intensive AI apps,” he said.

The research was published in *Nature Photonics*
www.doi.org/10.1038/s41566-023-01280-3

Visualize & Quantify Skin Treatment Effects

Optical Coherence Tomography (OCT) Imaging **provides a unique suite of quantitative analysis to speed and smooth cosmetics/aesthetics new product development.**

VivoSight is designed and manufactured by **Michelson Diagnostics Ltd**. (MDL) in Kent, England. Their flagship product, VivoSight Dx, is a state-of-the art Optical Coherence Tomography (OCT) system.
They believes that **VivoSight OCT images and measurements give scientists and clinicians access to valuable information about the skin** not readily available by other means.
Also they believe that OCT provides users with The Whole Picture of skin instead of just part of it.
To learn more about the benefits of OCT imaging for skin health product development, check their information https://lnkd.in/es46bZ4i



The 2023 Nobel Prize announcements

This year's Nobel Prize announcements will take place 2–9 October

All of the announcements will be streamed live at nobelprize.org

The prize-awarding institutions have decided to announce their 2023 prize decisions as follows:

PHYSIOLOGY OR MEDICINE – Monday, 2 October, 11:30 CEST at the earliest
The Nobel Assembly at Karolinska Institutet, Wallenbergsalen, Nobel Forum, Nobels väg 1, Solna
http://www.nobelprizemedicine.org

PHYSICS – Tuesday, 3 October, 11:45 CEST at the earliest
The Royal Swedish Academy of Sciences (Kungl. Vetenskapsakademien, KVA), Sessionssalen, Lilla Frescativägen 4A, Stockholm
www.kva.se/pressroom

CHEMISTRY – Wednesday, 4 October, 11:45 CEST at the earliest
The Royal Swedish Academy of Sciences, Sessionssalen, Lilla Frescativägen 4A, Stockholm
www.kva.se/pressroom

LITERATURE – Thursday, 5 October, 13:00 CEST at the earliest
The Swedish Academy (Svenska Akademien), Börssalen, Källargränd 4, Stockholm
https://www.svenskaakademien.se/en/press

PEACE – Friday, 6 October, 11:00 CEST
The Norwegian Nobel Committee, The Norwegian Nobel Institute (Norska Nobelinstitutet), Store Sal, Henrik Ibsens gate 51, Oslo
https://www.nobelpeaceprize.org/presse/arrangementer/accreditation-announcement-nobel-peace-prize-2023?instance=0

THE SVERIGES RIKSBANK PRIZE IN ECONOMIC SCIENCES IN MEMORY OF ALFRED NOBEL – Monday, 9 October, 11:45 CEST at the earliest
The Royal Swedish Academy of Sciences, Sessionssalen, Lilla Frescativägen 4A, Stockholm
www.kva.se/pressroom

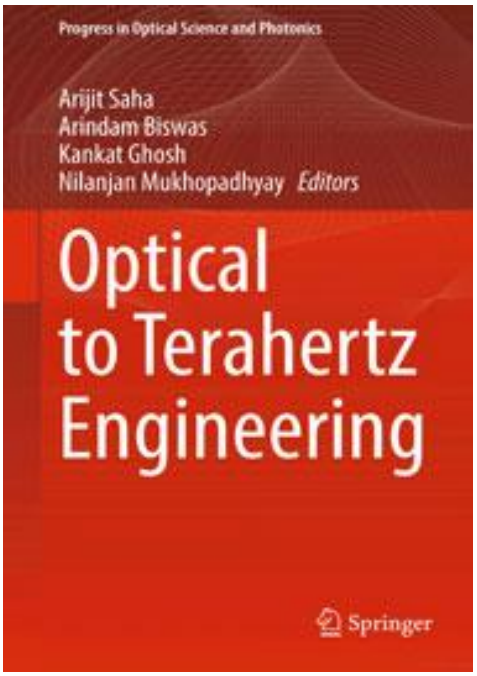
Books & Reviews

Principles of Biophotonics, Volume 3

This book represents a great opportunity **to remember the pioneering contributions of Prof. Gabriel Popescu to the fields of quantitative phase imaging and spectroscopy.** Prof. Popescu was a true leader in the optical and biomedical engineering communities **who passed away in June 2022.**

The timely revised edition of this book describes in-depth different aspects of the basic concepts of light propagation in linear, homogenous, dispersionless and isotropic media.

Publish Date: 07 September 2023



This book considers recent developments in optical and THz technology with an emphasis on their basic principles, notably on the different materials required for THz and optical engineering.

There is a broad variety of **optical applications** that provide concrete illustrations of the methods developed in the 11 chapters, for example, **in imaging and secured communication in both the THz and optical domains.**

Publish Date: 14 September 2023

A. Saha, A. Biswas, K. Ghosh and N. Mukopadhyay (Eds.

Jesse Explores: Vision and Vision Impairment

Author(s): Danuta Sampson; Gavrielle Rebecca Untracht

Jesse Explores Vision and Vision Impairment is an exciting picture book introducing the **fascinating topic of vision and why some people cannot see well.** The book offers a narrative introduction to the topic by a little boy called Jesse, is full of beautiful pictures, and includes fun, hands-on activities.

Thus, it is a perfect read for a young reader to learn about the beauty of vision and **raise awareness about vision impairment and its challenges.**

Jesse Explores: Vision and Vision Impairment | (2023) | Sampson | Publications | Spie

CONFERENCES

LASER World of PHOTONICS INDIA

India's Platform for Laser and Optical Technologies—Components, Systems and Applications
November 7–9, 2024 | Jio World Centre, Mumbai

LASER World of PHOTONICS INDIA

India's platform for laser and optical technologies - Components, Systems and Applications

India's Number 1 laser and photonics gathering, **LASER World of PHOTONICS INDIA 2021** brings together and connects the entire laser eco-system in one arena.

This Exhibition & Conference aims to reflect **actual developments in the Laser & Photonics industry** around the world. It also involves **innovative products** as well as their **industry solution & application**. We intend to boost grow the Indian Laser Industry by focusing on the Industry's leading technologies from 7-9 November in Mumbai.

Save this date in your calendar:

November 7–9, 2024

Supercontinuum white light lasers, ultrafast lasers, single-frequency fiber lasers, and photonic crystal fibers

NKT is hiring: Production Manager

About the job

Are you motivated by working with leading technology? Do you turn problems into challenges and see them all the way to manufacturable solutions? Do you like to develop as a Production Manager at the forefront of technology?

Then this role at NKT Photonics may be the right job for you!

NKT Photonics is an exciting, inspiring place to work where we encourage both personal and career development. To support our plans, we are now growing our team as we are looking for a Production Manager.

You will join a highly skilled and dedicated team of engineers and scientists and become key participant in developing lasers and accessories for various innovative applications. The ideal candidate will own the entire production process. They will strategize with other internal teams to ensure operational excellence. The will also run quality assessment to ensure customer satisfaction.

JOB OVERVIEW

Lead of the production team for electro-mechanical assembly, the optics preparation line, and the warehouse. Responsible for production, production scheduling, quality, and safety.

Read More

Great opportunities - they really are worth applying for

EPSRC's Science Engineering and Technology Board (SETB) and Strategic Advisory Teams (SATs) are recruiting this year,

from 5 September – 24 November 2023.

We are seeking applications from individuals with experience of industry, academia, users of research, and in the third sector and government organisations.

We welcome applications from those who are:

- in full-time or part-time work across all career stages
- on sabbatical or a career break
- based in academia (including research technical professionals and research software engineers), industry, the third sector or government organisation

You will not be required to act as representative of your own organisation, research area or sector, but rather as someone who is able to contribute on a non-affiliated basis, and will be expected to adhere to the **seven principles of public life**.

You can view the advert here: https://lnkd.in/eTSCjT7e

Are you interested in pursuing a PhD in the exciting field of Biomedical optics?

Join the School of Biomedical Engineering & Imaging Sciences at King's College London!

Deep-tissue photoacoustic imaging with optical fluence optimisation

Applications are invited for a fully funded 3,5 year full-time PhD studentship (including home tuition fees, annual stipend and consumables) starting on 1st February 2024.

Prospective candidates should have a 1st or 2:1 M-level qualification in Biomedical Engineering, Physics, Engineering, Computer Science, Mathematics, or a related programme .

Preference will be given to candidates with a background conducive to multidisciplinary research and preferably programming skills.

Read More

Closing date: 30th October 2023

Commonwealth PhD Scholarships
(for least developed countries and fragile states)

These Commonwealth PhD Scholarships are for candidates from least developed countries and fragile States in the Commonwealth, for full-time doctoral study at a UK university.

Funded by the UK Foreign, Commonwealth & Development Office (FCDO), Commonwealth PhD Scholarships enable talented and motivated individuals to gain the knowledge and skills required for sustainable development, and are aimed at those who could not otherwise afford to study in the UK.

Applications for Commonwealth PhD scholarships for the 2024/25 academic year are **open until October 17/10/23**

For full details, please visit the Commonwealth Scholarships website.

Did you know ?

that diode lasers are key components for next-generation wearable health monitors?

Especially the new and more advanced applications - such as ***lactate, glucose, and hydration monitoring*** - rely on optical techniques that depend on the special properties of diode laser light sources.

NEW POSSIBILITIES IN BIOSENSING

Explore why **diode lasers** represent a **critical technology** for supporting the **rapid emergence of next-generation wearable health monitors**. A key trend in consumer electronic devices is the evolution of smartwatches and other wearable devices to provide personal health monitoring. What began with heart rate monitoring often now includes heart rate variability (stress), blood pressure, and blood-oxygen monitoring. Devices that can also perform hydration or lactate monitoring to assess muscle fatigue are under development. There are **claims that a completely non-invasive glucose monitor will soon be available**, which will improve the quality of life for diabetics. Read More

Diode Lasers key to optical sensing in personal devices | Coherent

Did you know ?

Leibinger Laser Prize

The **Berthold Leibinger Innovationspreis** is an award for given to those who have **created applied laser technology and innovations on the application or generation of laser light**.

Every two years, the Berthold Leibinger Innovationspreis is presented **to honor innovations in laser technology, irrespective of whether the innovation relates to a beam source or an application** and whether it was developed by a research institution or is a product of industry. Innovations are accepted for consideration as applications or nominations. Individuals or groups from all over the world are eligible for consideration. The application must include a description of the technology and its commercial aspects.
The jury selects a shortlist of eight finalists from among the applications and nominations. The finalists are invited to attend the jury meeting at the Berthold Leibinger Stiftung and present their work in person. An awards ceremony is held to honor the finalists and award winners. Read More

Anne L'Huillier from Lund University, Sweden, received the prestigious 2023 Berthold Leibinger Zukunftspreis for her **groundbreaking work in the field of attosecond physics**, **a field of science that explores ways to generate, measure, and use light pulses that are much shorter than 1 fs.**
Within 100 attoseconds, light moves only 30 nm, which is less than the tenth part of blue light's wavelength. Attoseconds are the timescale in which an electron's movement occurs in an atom. An attosecond flash allows the study of the dynamics of the electron as it gets excited and leaves the atom.

Live stream of the awards ceremony of the Berthold Leibinger Innovationspreis and Zukunftspreis 2023 on September 22, 2023.

Did you know ?

World Cancer Research Day

September 24, 2023

Cancer research has led us to better treatments and better ways to care for people with cancer. Through research, we aim to improve cancer survival as well as the quality of that survival. And hopefully, one day, cancer research will lead us to a cure for the disease.
Since 2016, the American Society of Clinical Oncology (ASCO) and other leading cancer organizations from around the world have teamed up in the fight against cancer by celebrating **World Cancer Research Day**. This day, which **takes place every year on September 24,** emphasizes how essential it is to support cancer research and the role that it plays in reducing the devastating effects of the disease.

When the organizations that founded World Cancer Research Day first came together in 2016, they established **The World Declaration for Research on Cancer**, which has **5 specific objectives to achieve by 2025:**

1: Increase awareness of the significance of cancer research.
2: Establish adequate and lasting financial funding.
3: Encourage collaboration on a global scale.
4: Teach effective research strategies.
5: Encourage the development of cancer research infrastructures in every country. Read More

OPTICS & PHOTONICS NEWS

Optics & Photonics News Magazine
September 2023 Issue

- Illuminating Wildfire Risk
- The Birth of Picophotonics

Browse all Issues

Image of the Week

Striking images of optics and photonics, contributed by OPN readers

Structural Color

Diffractive structures create the color of the blue Morpho (Morpho peleides) butterfly wings.
[OPN 2022 After Image Photo Contest]

—Samuel F. Pellicori, Senior Member, Optica, Santa Barbara, CA

Webinars

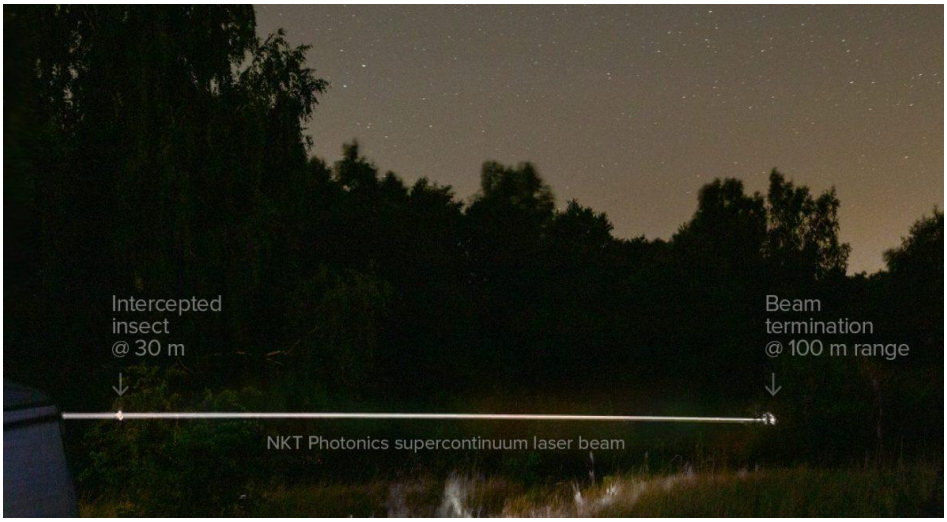
We recommend our NETLAS PhD students to attend these upcoming webinars (part of the free Thorlabs webinar series). Thorlabs' Digital Webinars are covering a variety of topics, each with a dedicated live Q&A session, and have a common goal of providing educational, engaging, and valuable content.

Thorlabs Previously Recorded Webinars

Thorlabs' Digital Webinar series began in mid-2020. Each webinar and Q&A session is recorded and added to the archive on Thorlab's web page.

Monitoring insect diversity with hyperspectral lidar

Hyperspectral lidar offers a revolutionary approach to monitoring insect diversity by analyzing wing interference patterns.



Insects play a vital role in our ecosystems by aiding in crop pollination, decomposition, and nutrient recycling. However, we are witnessing a decline in both the population of insects and the diversity of species.

The main reasons for their **disappearance are habitat loss, pesticide use, and climate change.** So, across the planet, we **implement strategies to protect insects and their habitats,** and we follow up to see if we succeed. “Halt biodiversity loss” is one of the United Nation’s World Goals. But how do you count and classify free-flying insects? Read More

Superlum's new bell-spectrum SLD portfolio

Superlum is pleased to announce that they has **updated their bell-spectrum SLD portfolio in the wavelength range of 840 nm**.

These modules were formerly known as SLD-381.

New standard P/Ns are **S840.25.12/20**, **S840.25.30**, and **S840.50.10/15**. They cover the entire range of parameters previously available with SLD-381 at 840 nm.
We **significantly improved the price-quality ratio for these SLD modules** and **extended the warranty** obligations.
We encourage you to check our **BLL controllers** - integrating our sources into your equipment is now easier than ever! We are ready to extend the warranty to up to 25,000 hours of continuous operation for specific SLD modules, provided that the SLD is used with Superlum controllers.

Superlum | Products (superlumdiodes.com)

Luna Innovations Incorporated (www.lunainc.com) is a **leader in optical technology**, providing unique capabilities in high-performance, fiber optic-based, test products for the telecommunications industry and distributed fiber optic-based sensing for a multitude of industries. Luna's business model is designed to **accelerate the process of bringing new and innovative technologies to market**.

Check their products

FIBER OPTIC SENSING AND NON-DESTRUCTING TESTING PRODUCTS

High-Definition Distributed Fiber Optic Sensing
High-Speed Multipoint Fiber Optic Sensing
Terahertz Gauging and Imaging

COMMUNICATIONS TESTING AND PHOTONIC CONTROL PRODUCTS

Optical Component Test
Fiber Optic Network Test
Polarization Management and Emulation
Optical Modules and Components

Latest News

Luna Wins Contract for Mine Conveyor Belt Monitoring in South Africa

Happy Birthday to Irène Joliot-Curie

12 September 1897 (died 17 March 1956)

Irène Curie, born in Paris, September 12, 1897, was the daughter of Pierre and Marie Curie, and since 1926 the wife of Frédéric Joliot. After having started her studies at the Faculty of Science in Paris, she served as a **nurse radiographer during the First World War.** She became Doctor of Science in 1925, having prepared a thesis on the alpha rays of polonium.

Either alone or in collaboration with her husband, she did **important work on natural and artificial radioactivity, transmutation of elements, and nuclear physics**; she shared the Nobel Prize in Chemistry for 1935 with him, in recognition of their synthesis of new radioactive elements, which work has been summarized in their joint paper *Production artificielle d'éléments radioactifs. Preuve chimique de la transmutation des éléments* (1934).

Irène and Marie Curie. As a young girl, Irène was taught physics by her mother. Later, she worked as her mother's laboratory assistant.

Irène Curie, age 23, accepting an honorary degree on Marie Curie's behalf. Irène often stood in for her mother, who often suffered ill-health caused by high radiation exposures.

Read More Irene Joliot-Curie - Biography, Facts and Pictures (famousscientists.org)

Frédéric and Irène Joliot-Curie | French chemists | Britannica

NETWORK EVENTS

We invite all partners to communicate events and ideas to place in our newsletter

Please send any piece of news, on NETLAS activities or anything else happening that may be of interest to the NETLAS community, to Ramona Cernat: R.Cernat@kent.ac.uk and to Adrian Podoleanu: ap11@kent.ac.uk