



32nd Newsletter of the ITN:

“NEXt Generation
of Tuneable LASers for optical
coherence tomography”

(NETLAS)

led by University of Kent

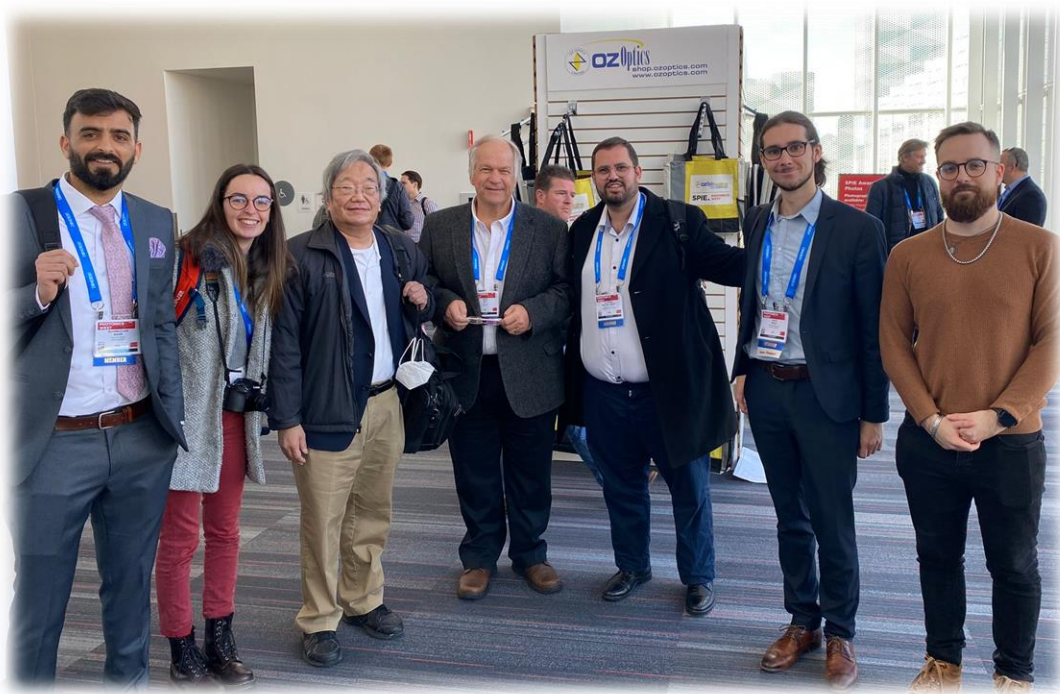


FEBRUARY 2023



SPIE Photonics West 2023

The most important annual event
featuring the best in photonics
research and technology

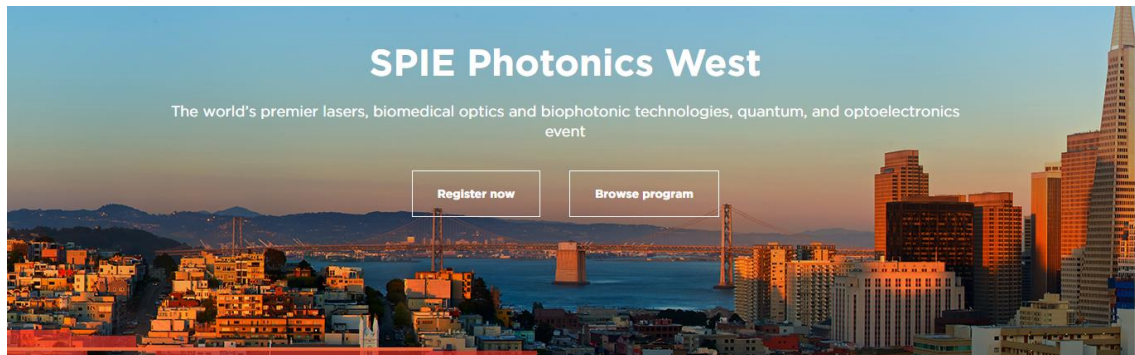


28 January - 2 February 2023

San Francisco, California, United States

NETLAS PhD Students meeting two of OCT's pioneers:

Prof. Fujimoto (middle left) &
Prof. Izatt (middle right)



Photonics West 2023

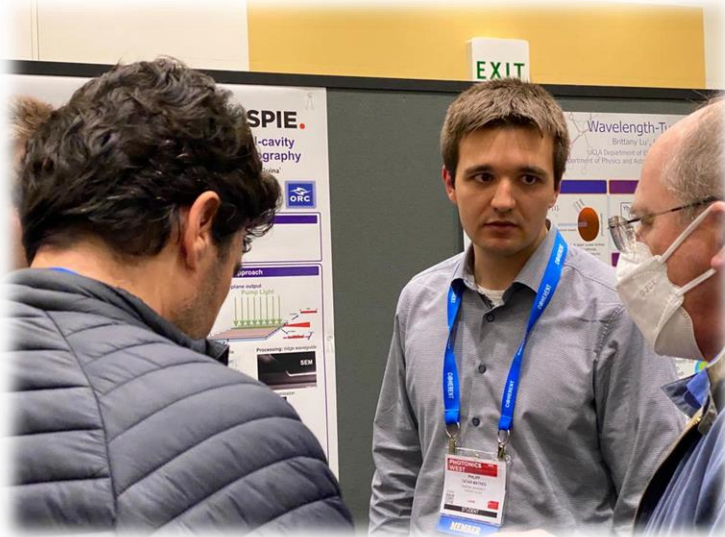
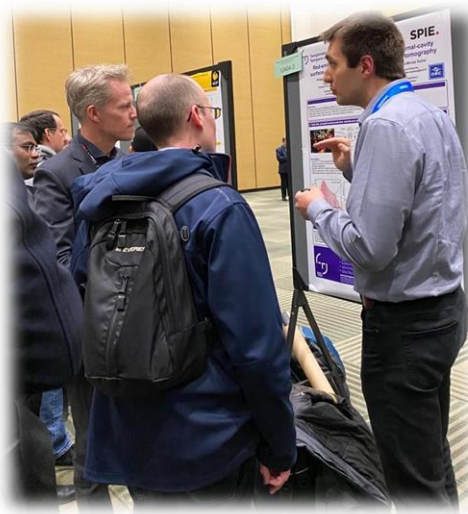
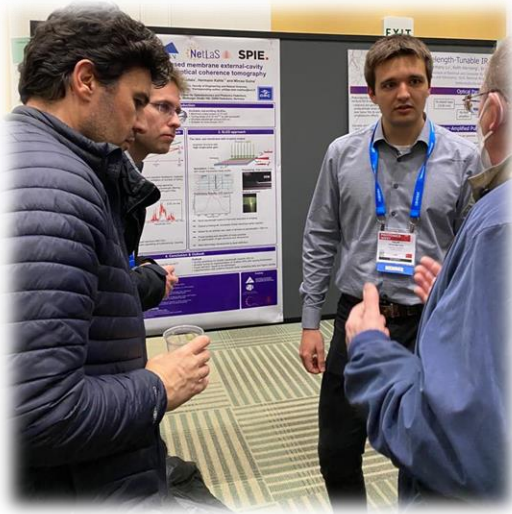
Feedback from the NETLAS PhD Students Attendance

“This year’s Photonics West was a lot different from the one last year. Apart from having a lot more people attending both the conference and the exhibition centers, there were also a lot more people that I personally knew or have gotten to know within the frame of Photonics West.

I also managed to pull off a collaboration with researchers from Southampton, who I will be able to visit during my secondment stay in Canterbury (after all, it’s just a 2h drive away).

During the Poster session, I was also given the chance to discuss my project for an extended amount of time with Mark Kuznetsov, the first one to demonstrate the operation of VECSEL systems at non-cryogenic temperatures.

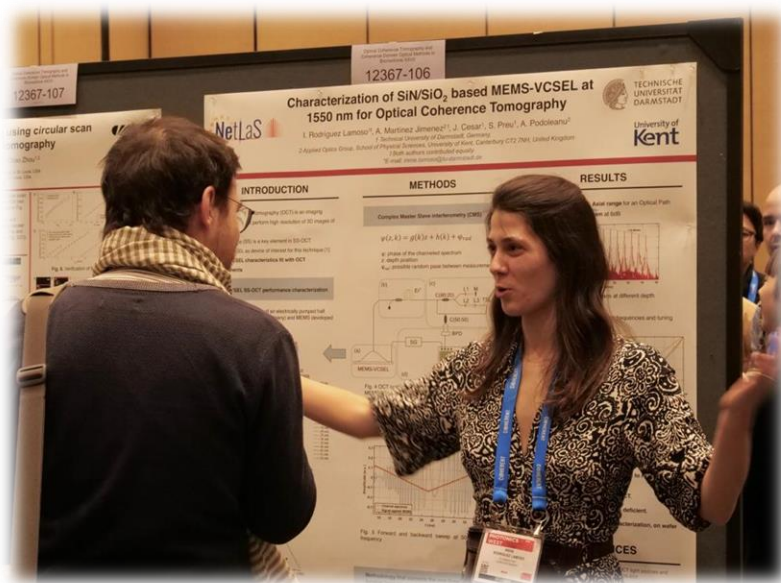
I am grateful to have been given the opportunity to discuss my topic to such a truly fascinating person – He is a really kind and curious person that likes to inspire people to this date. I am happy to share some photos with you, please see them below”. – NETLAS PhD Student Philipp Tatar-Mathes



@ [Philipp Tatar-Mathes](#) recruited by **Tampere University**, Finland with secondment at the [University of Kent, Applied Optics Group](#)



“It was my first Photonics West conference experience and it was amazing. The conference was full of different session and topics very well organised thanks to the conference app. I was very privileged to attend the presentations of our colleagues from NETLAS and see how much we have grown since the program started. For me was very exciting being able to see similar work to mine and being able to assist to the sessions of groups whose paper I have read many times. The conference also had a huge expo with many stands of different companies where we could assist also to talks. The poster sessions was full of different topics, personally, the presentation of my poster was amazing, many people was interested and I really enjoyed sharing my work with others. I am looking forward for my next conference, a few photos from the conference will follow”. – **NETLAS PhD Student Irene Rodriguez Lamoso**





@ [Irene Rodriguez Lamoso](#) recruited by **Technical University of Darmstadt (TUDA)** with secondment at the [University of Kent, Applied Optics Group](#)



“Photonics West 2023 conference was a unique experience. I was expecting a lot of people and companies: I have not been disappointed! I had the great pleasure to meet researchers I knew from previous summer schools and conferences, and catch up with their projects.

I could also expand my network, both through informal discussions and through the networking events organized by SPIE. This was an interesting dive into the American research environment as my previous conferences were dominated by European researchers. I had constructive feedbacks on my oral presentation and attended talks with interesting concepts that could be applied on our research”.



[@ Sacha Grelet](#) recruited by [NKT Photonics](#), Denmark with secondment at the [University of Kent](#), [Applied Optics Group](#)



“For many of the NETLAS students, **Photonic West was the first big conference we could attend**. Even for some of us, it was the first time crossing the Atlantic Ocean. All of this means that the conference was a whole experience from the very beginning. We did appreciate that **interactions and networking are a key at PW**, indeed many collaborations start here. I personally got to know most of Luebeck and Tampere teams. On the scientific side, I think PW allows you to understand which the current trends are in OCT and in general biomedical optics. **Miniaturization and making the OCT available to everyone** is definitely one of them. I listen to several talks in which interferometers and detectors are integrated in PICs. During the talks most of the group were in the same session what means that nervous and doubts were all shared, finely enough everything went well and **we had the opportunity to chat with Prof. Fujimoto and Prof. Izzat**. They were incredibly kind with us! Also, I was able to discuss my setup with many researchers working on mode-locked lasers which gave me a lot of input to continue exploring my system. Moreover, **the BIOS and Photonic West exhibition were absolutely impressive**; it was nice to see again our partners in NETLAS like **OCTLight** and **NKT Photonics**. Apart from them, we had the opportunity **to talk with many companies about key components that we use in our research**, seeing in some companies the true American way of doing business. Overall, I'm really grateful to have the opportunity of being at the conference, and I want to thank everyone that made it possible. Hope to be back at some point! Enjoy a selection of my photos below”. –@ **NETLAS PhD Student Alejandro Martinez Jimenez**



@Alejandro Martinez
Jimenez recruited by
University of Kent, Applied
Optics Group (AOG) with
secondment at NKT
Photonics Denmark



"I enjoyed attending Photonics West 2023, during this time I attended presentations about topics like OCT, frequency-combs, transfer printing, micro-optics, VCSELs, but there were so many more topics and lots of people too. It was nice to also meet again with other students from NETLAS, friends from my masters and also get to know more photonics people. Presenting here was also a good experience to help me improve my communication skills. This was also the first time I visited USA so it was nice to get to know more about the culture of such iconic city as San Francisco".



@ Esteban Andres Proano Grijalva recruited by **Technical University of Denmark (DTU)** with secondment at the **University of Kent**, **Applied Optics Group**



"As a young researcher, going to Photonics West is the best international conference you can hope to attend. Everyone is there, from inspirational people like Professor Fujimoto to Professor Izatt, but also all your lab mates who are as stressed as you are before their presentation. It's a great opportunity to present your research to the world of photonics, to get feedback and new ideas on how to further develop your setup. However, the main outcome I get from this conference is the networking you can do. Meeting other PhD students from all over the world, talking to different professors (putting a face to a paper), listening to interesting people, and also getting a new guidance on how you can run your life in the years to come. I also enjoyed listening to some speeches that I don't know much about to get a sense of what is going on in different areas of photonics. I would recommend everyone to watch the recorded talk by Professor Boubacar Kanté: "The Berkeley Surface Emitting Laser (BerkSEL)", I found myself really into this talk even though I am not sure I understood anything. Finally, since I left Lübeck and my lab about 7 months ago, it was great to see all my colleagues who came from Germany, and to have them meet all the NETLAS students, it was great to hang out, we are starting to have a big network just between us. Enjoy my photos below". – NETLAS PhD Student Marie Klufts

Photo1. Marie during the presentation

Photo2. Lübeck PhDs and Drs.

Photo3. Asim, Marie, Prof. Fujimoto, Prof. Izatt, Alejandro, Sacha, Rene

Photo4. Marie at the "Paws for a Break", social and networking events organized by Thorlabs

Photo5. NETLAS colleagues Sacha Marie Irene

Photo6. Opening of the 2nd exhibition

Photo7. Asim, Marie and Philipp (Colleague from Lübeck)

Photo8. NETLAS colleagues Alejandro, Marie and Asim

Photo9. Léo and Philipp (colleague from Lübeck) Alejandro and Sacha



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[@Marie Klufts](#) recruited by [University of Lübeck](#) with secondment at [University of Kent, Applied Optics Group \(AOG\)](#)



“Photonics West 2023 was a premier event in the field of optics and photonics, it provides us the opportunity to learn about the latest research and technologies in the field. The conference featured a range of technical sessions and workshops, as well as a vast exhibition floor where companies showcased their latest products and innovations.

In addition to the technical sessions and exhibition, Photonics West also offered numerous networking opportunities. We had chance to connect with other researchers, engineers, and industry professionals, share our work, and gain valuable insights into the latest trends and challenges in the field.

The location of the conference in San Francisco was also a great advantage, with its vibrant culture, beautiful architecture, and stunning views of the bay area. There were plenty of great restaurants, museums, and other attractions to explore when we had some free time from the conference.

Overall, I had a valuable and enjoyable experience at Photonics West. Attending conferences like this can help us stay up to date on the latest advancements in field and connect with other professionals who share your interests and passions. In last, I’d like to recommend everyone in our student’s network to attend this conference in upcoming years. Enjoy below a few photos from the conference.” – **PhD Student Muhammad Asim Bashir**





[@ Muhammad Asim Bashir](#), recruited by [University of Lübeck](#)



"For me, as the first time attender, it has been a life time experience to visit US and be present and presenter at the prestigious Photonics West conference. The amount of the talks and booths was overwhelming and one could have learned progresses and innovations in the fields of his interest. Intriguingly, I had the chance to met there the members of the research group whose papers are the main references for my research of dispersion tuned swept sources."

@ Rene Riha recruited by [University of Kent](#), [Applied Optics Group \(AOG\)](#) with secondment at [Superlum Ireland](#)

Congratulations to our NETLAS PhD Students

[Alejandro Martínez Jiménez](#), [Marie Klufts](#),
[Rene Riha](#), [Irene Lamoso](#), [Muhammad Ashim](#)
[Bashir](#), [Esteban Proano](#), [Sacha Grelet](#) and
[Philipp Tatar-Mathes](#) for their presentations at the
Photonics West Conference, San Francisco,
28 January - 2 February 2023!

Well done everyone!!!



SECONDMENTS

Netlas PhD Student

Masoud Payandeh

Recruited by: Technical University of Denmark (DTU)

Secondment started on 1st February 2023 at Tampere University (TAU)



Duration: three months

PhD Project: Long-wavelength MEMS VCSEL for swept source OCT

“I started my secondment at Tampere University on 1st of February 2023. The duration of this external stay is planned for three months. Based on the meetings I had with my supervisors from DTU and ORC, we arranged three main tasks including;

- Simulation of reflectivity of dielectric DBR mirrors for long wavelength MEMS VCSELs and then deposition of the mirror in the cleanroom of Tampere University
- Fabrication of Edge Emitting Lasers at the wavelength of 670 nm with a focus on the definition of facets
- Gain measurement at 2 μm



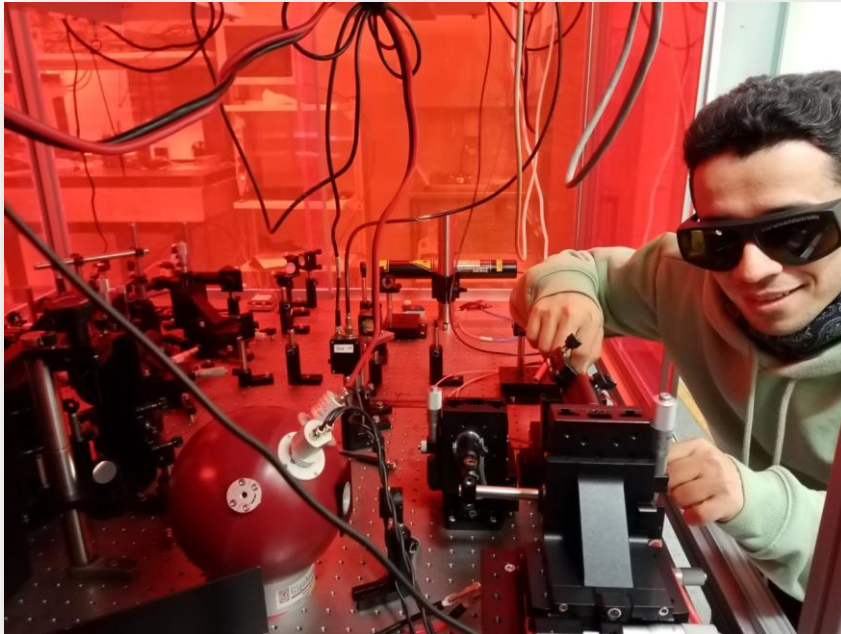
In the first week of my stay at Tampere University, I had training on Essential Macleod software to design the reflectivity of DBR mirrors at 1550 nm. Based on the design, we deposited seven stacks of SiO₂/TiO₂ using IBS sputtering machine. Then I measured the reflectance spectrum of the deposited stacks by Spectrophotometer, which agreed with the simulation results. Now, I want to deposit the DBR mirrors of the MEMS VCSELs (prepared at DTU) with the same parameters as the test done. In parallel, I had the safety courses and hands-on training to get access to the cleanroom.

In the second week, I had an optical lab and cleanroom tour led by my NETLAS colleague [Philipp Tatar-Mathes](#) (ESR at Tampere University). Philipp showed me his set-up for measuring the edge-emitting lasers' spectrum. Philipp also gave me training inside the cleanroom on how to make edge-emitting lasers, including lithography, dry etching, bonding, and making facets.

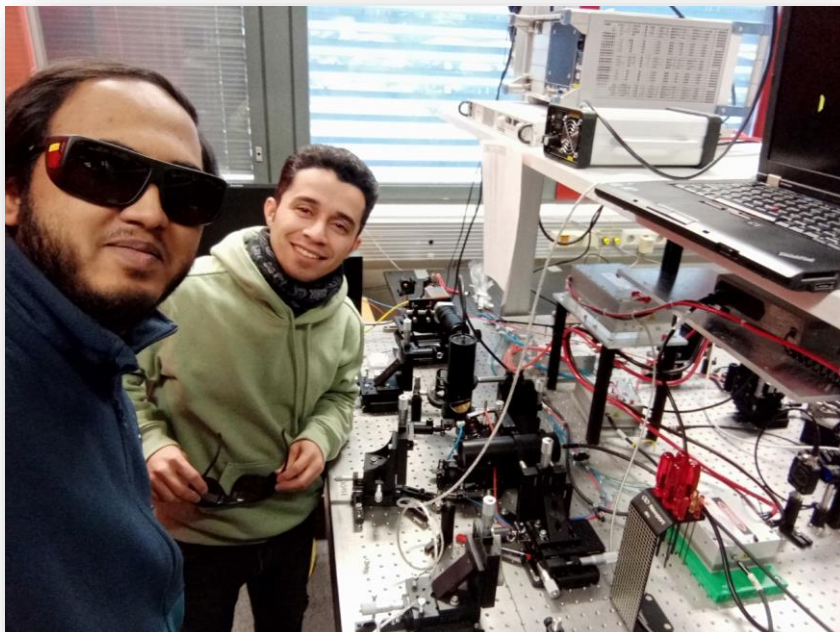
I am working with my NETLAS colleague [Ifte Khairul Alam Bhuiyan](#) (ESR at Tampere University) to fabricate the edge-emitting lasers. In the first week of March, I will go back to DTU to complete the fabrication of MEMS VCSELs, and bring the samples to deposit the DBR mirrors in the cleanroom of Tampere University. I am happy to share with everyone a few photos from my secondment.”



[Tampere Orthodox Church, Tampere, Finland](#)



Masoud
working in
the lab
during his
secondment
at Tampere
University



Masoud
working in
the lab
during his
secondment,
together
with his
NETLAS
colleague
Ifte,
ESR at
Tampere
University



Ice Hockey, Finnish League 2022-23, Ilves vs Kookoo, Nokia Arena, Tampere, Finland

@ [Masoud Payandeh](#)

PUBLICATIONS

Cavity-dumping using a microscopic Fano laser

Gaoneng Dong, Shih Lun Liang, Aurimas Sakanas, **Elizaveta Semenova**, **Kresten Yvind**, Jesper Mørk, and Yi Yu

Optica, Vol. 10, Issue 2, pp. 248-254 (2023)

<https://doi.org/10.1364/OPTICA.476758>

A microlaser with low energy consumption and high speed is crucial for on-chip photonic networks. Presently, the modulation of microlasers is based on modulating the gain of the laser, which implies a trade-off between the output peak power and modulation energy. Also, the temporal width of the output pulse is restricted by the carrier relaxation time. These limitations can be overcome by modulating, instead, the loss of the laser by the scheme of cavity dumping, which is ideal for intense and ultrashort pulse generation. However, the miniaturization of cavity-dumped lasers has been a long-standing challenge, and no microscopic cavity-dumped lasers have yet been realized. Here, we demonstrate an ultra-small cavity-dumped microscopic laser based on an optical Fano resonance, which generates optical pulses with peak power more than one order of magnitude higher than the corresponding conventional gain-modulated laser. This demonstration paves the way for realizing microscopic lasers for low-power chip-scale applications. [Read More](#)

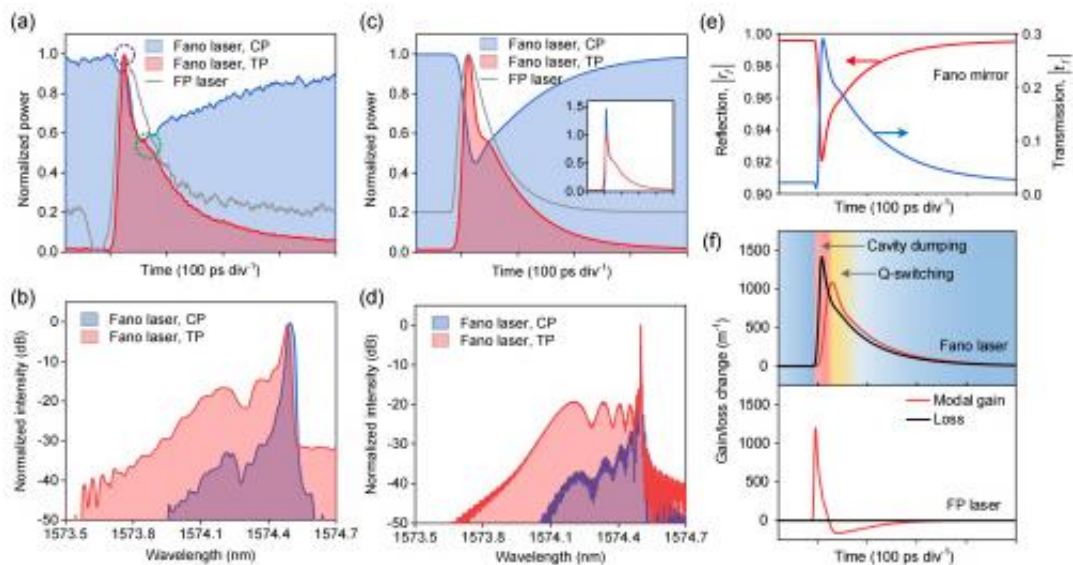


Fig. 4. Demonstration of cavity dumping in a Fano laser.



Post-2000 Nonlinear Optical Materials and Measurements: Data Tables and Best Practices

Nathalie Vermeulen, **Kresten Yvind** et.al

<https://doi.org/10.1088/2515-7647/ac9e2f>

In its 60 years of existence, the field of nonlinear optics has gained momentum especially over the past two decades thanks to major breakthroughs in material science and technology. In this article, we present a new set of data tables listing nonlinear-optical properties for different material categories as reported in the literature since 2000. The papers included in the data tables are representative experimental works on bulk materials, solvents, 0D-1D-2D materials, metamaterials, fiber waveguiding materials, on-chip waveguiding materials, hybrid waveguiding systems, and materials suitable for nonlinear optics at THz frequencies. In addition to the data tables, we also provide best practices for performing and reporting nonlinear-optical experiments. These best practices underpin the selection process that was used for including papers in the tables. While the tables indeed show strong advancements in the field over the past two decades, we encourage the nonlinear-optics community to implement the identified best practices in future works. This will allow a more adequate comparison, interpretation and use of the published parameters, and as such further stimulate the overall progress in nonlinear-optical science and applications.

Accepted for publication in Journal of Physics:

Photonics, open-access paper: 209 pages, 8 figures, 14 tables.
(2023)

<https://iopscience.iop.org/article/10.1088/2515-7647/ac9e2f>

[2301.06138.pdf \(arxiv.org\)](#)

Fine-tunable near-critical Stranski-Krastanov growth of InAs/InP quantum dots

Yury Berdnikov, **Kresten Yvind** et.al

Mesoscale and Nanoscale Physics

<https://doi.org/10.48550/arXiv.2301.11008>

Emerging applications of self-assembled semiconductor quantum dot (QD)-based nonclassical light sources emitting in the telecom C-band (1530 to 1565 nm) present challenges in terms of controlled synthesis of their low-density ensembles, critical for device processing with an isolated QD. This work shows how to control the surface density and size of InAs/InP quantum dots over a wide range by tailoring the conditions of Stranski-Krastanow growth. We demonstrate that in the near-critical growth regime, the density of quantum dots can be tuned between 10^7 and 10^{10}cm^{-2} . Furthermore, employing both experimental and modeling approaches, we show that the size (and therefore the emission wavelength) of InAs nanoislands on InP can be controlled independently from their surface density. Finally, we demonstrate that our growth method gives low-density ensembles resulting in well-isolated QD-originated emission lines in the telecom C-band.

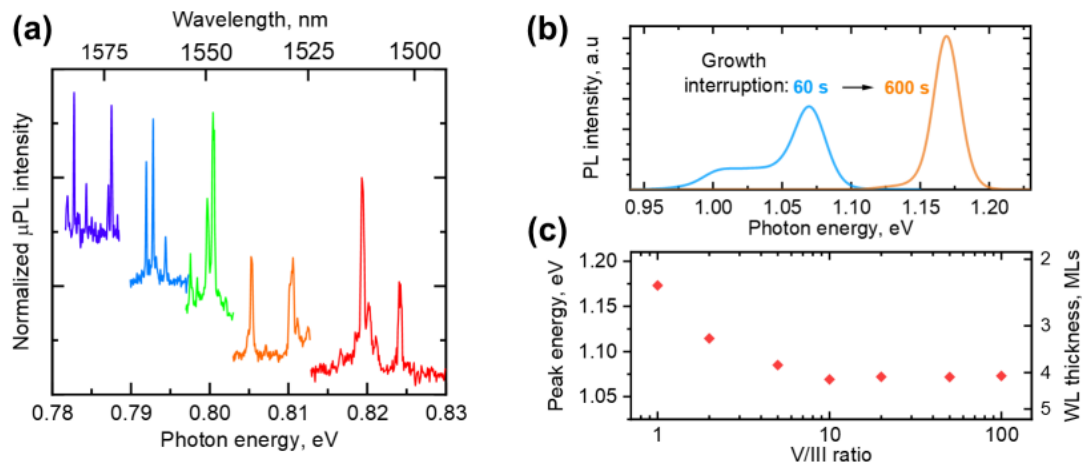


Figure 5: (a) Low temperature μPL spectra of QDs acquired at 5 K. (b) PL spectra of WL after 60 and 600 s of growth interruption. (c) Measured energy of $\text{InAs}_x\text{P}_{1-x}$ WL peak as the function of V/III ratio for near-critical QDs. The right axis shows the corresponding WL thickness calculated for $x = 0.75$

[2301.11008.pdf \(arxiv.org\)](https://arxiv.org/abs/2301.11008)

Enhancing intermediate band solar cell performances through quantum engineering of dot states by droplet epitaxy

Andrea Scaccabarozzi, ... [Mircea Guina](#) et al.

02 February 2023, Progress in Photovoltaics Research and Applications

<https://doi.org/10.1002/pip.3672>

We report the effect of the quantum dot aspect ratio on the sub-gap absorption properties of GaAs/AlGaAs quantum dot intermediate band solar cells. We have grown AlGaAs solar cells containing GaAs quantum dots made by droplet epitaxy. This technique allows the realization of strain-free nanostructures with lattice matched materials, enabling the possibility to tune the size, shape, and aspect ratio to engineer the optical and electrical properties of devices. Intermediate band solar cells have been grown with different dot aspect ratio, thus tuning the energy levels of the intermediate band. Here, we show how it is possible to tune the sub-gap absorption spectrum and the extraction of charge carriers from the intermediate band states by simply changing the aspect ratio of the dots. [Read More](#)

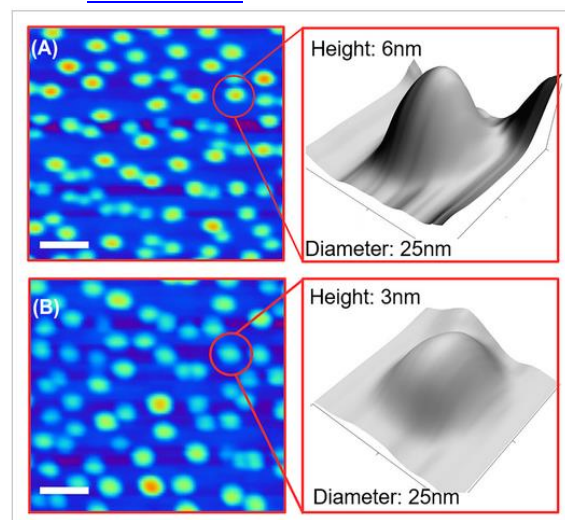


Figure 1; AFM images of uncapped samples. Left panels: top view of the samples ($500 \times 500 \text{ nm}^2$) of SA (A) and SB (B). The white bars indicate 100-nm length.

Pilot study of optical coherence tomography angiography-derived microvascular metrics in hands and feet of healthy and diabetic people

Untracht, G.R. et al. Danuta M. Sampson

Scientific Reports volume 13, Article number: 1122 (2023)

<https://doi.org/10.1038/s41598-022-26871-y>

Optical coherence tomography angiography (OCTA) is a non-invasive, high-resolution imaging modality with growing application in dermatology and microvascular assessment. Accepted reference values for OCTA-derived microvascular parameters in skin do not yet exist but need to be established to drive OCTA into the clinic. In this pilot study, we assess a range of OCTA microvascular metrics at rest and after post-occlusive reactive hyperaemia (PORH) in the hands and feet of 52 healthy people and 11 people with well-controlled type 2 diabetes mellitus (T2DM). We calculate each metric, measure test–retest repeatability, and evaluate correlation with demographic risk factors. [Read More](#)

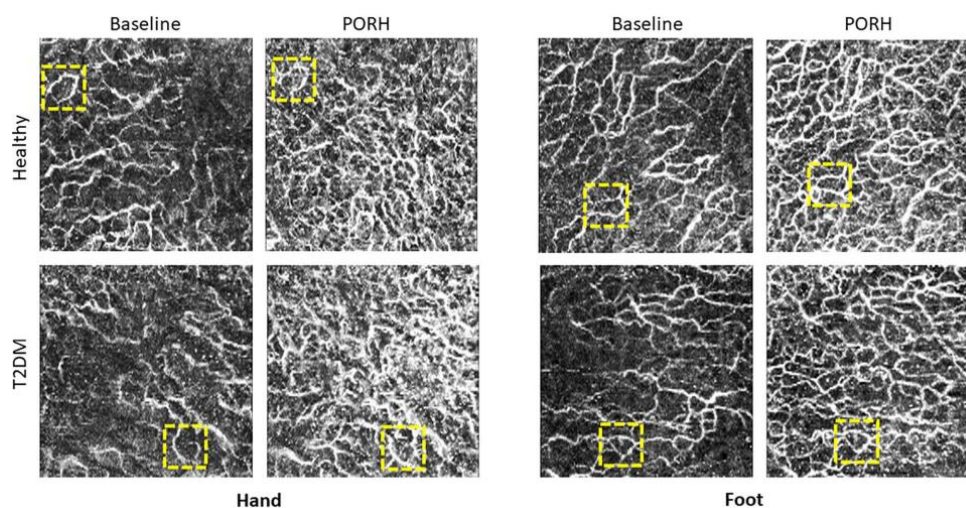


Figure 1. Representative OCTA MIP images from the hand (left) and the foot (right) representing the healthy group (top) and the diabetic group (bottom). All images are from participants in the 50–60 years old age group. All images are 5×5 mm. Dotted yellow boxes indicate 1×1 mm identical regions in the baseline and PORH datasets and demonstrate the amount of misalignment between scans



Making the case for hyperspectral imaging in surgical practices

Hyperspectral cameras provide much more information about an object's physical properties than can be discerned with the naked eye—making it ideal for use during surgeries. Read more about **hyperspectral imaging** [here](#) and [here](#).

Hyperspectral cameras truly “make the invisible visible” by illuminating an object and then capturing its reflected light in many narrow spectral bands. The technology has already found use in applications ranging from precision agriculture (think weed control and pest surveillance) to industrial machine vision for corrosion detection or quality inspection and environmental monitoring (e.g., spotting oil spills or plastic waste).

Hyperspectral cameras are now poised to revolutionize the medical realm. Imagine surgeons being able to make decisions based on real-time information about tissues' chemical composition at a molecular level, seeing the oxygenation of blood flowing through arteries and vessels, or distinguishing *in vivo* between healthy and anomalous tissue, such as tumor cells. [Read more](#)



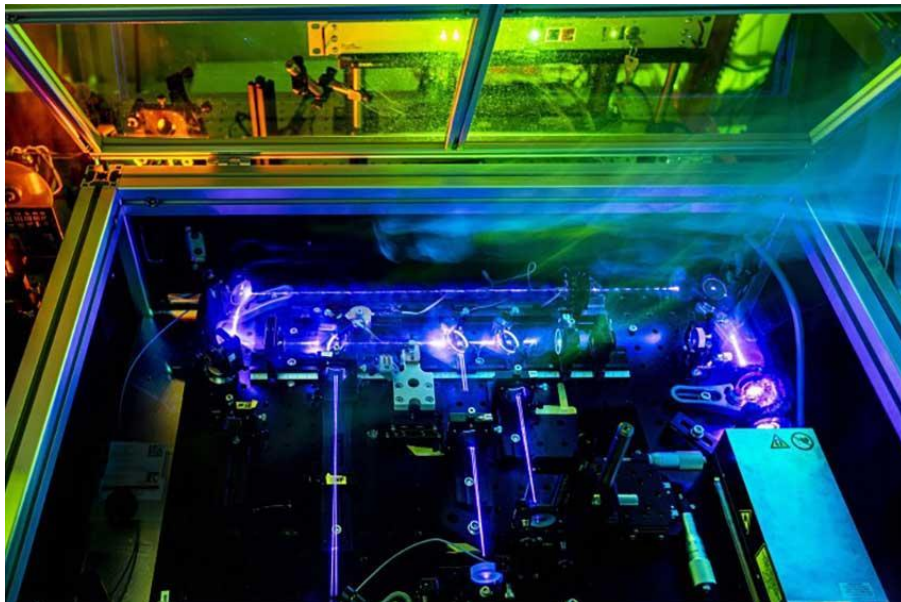
FIGURE 1. Thanks to a small form factor and compatibility with standard C-mount optics, Imec's snapscan can easily be mounted on a standard surgical microscope. @ laserfocusworld.com



Research Project Will Track Tumors with Quantum Imaging

A project funded by the German Federal Ministry of Education and Research will investigate the viability of **quantum** optical imaging for tumor diagnostics. Nine project partners, including **TU Darmstadt**, will explore the issue in the €6.7 million (\$7.2 million) “Quancer” project under the framework program “Quantum Technologies: From the Basics to the Market.”

The various imaging techniques used to diagnose cancer aim to detect tumour tissue and make it visible. When suspicious tissue is detected, doctors take a sample and examine it further. The gold standard of diagnostics are contrast methods that stain certain molecules and light **microscopy** to show their distribution.



Experimental setup of a nonlinear interferometer for 'spooky' quantum imaging with undetected light. Courtesy of TU Darmstadt.

According to Markus Gräfe, TU Darmstadt professor at the Institute of Applied Physics, the project will ultimately introduce a new tool for cancer diagnostics.

Read More on <https://www.photonics.com/>

Biomarkers of macular neovascularisation activity using optical coherence tomography angiography in treated stable neovascular age related macular degeneration

Daren Hanumunthadu, Azahir Saleh, Daniela Florea, Konstantinos Balaskas, **Pearse A Keane**, Tariq Aslam & Praveen J. Patel

BMC Ophthalmol 23, 68 (2023).

<https://doi.org/10.1186/s12886-022-02749-5>

The aim of this study was to describe features of disease activity in patients with treated stable macular neovascularisation (MNV) in neovascular age related macular degeneration (nAMD) using optical coherence tomography angiography (OCTA).

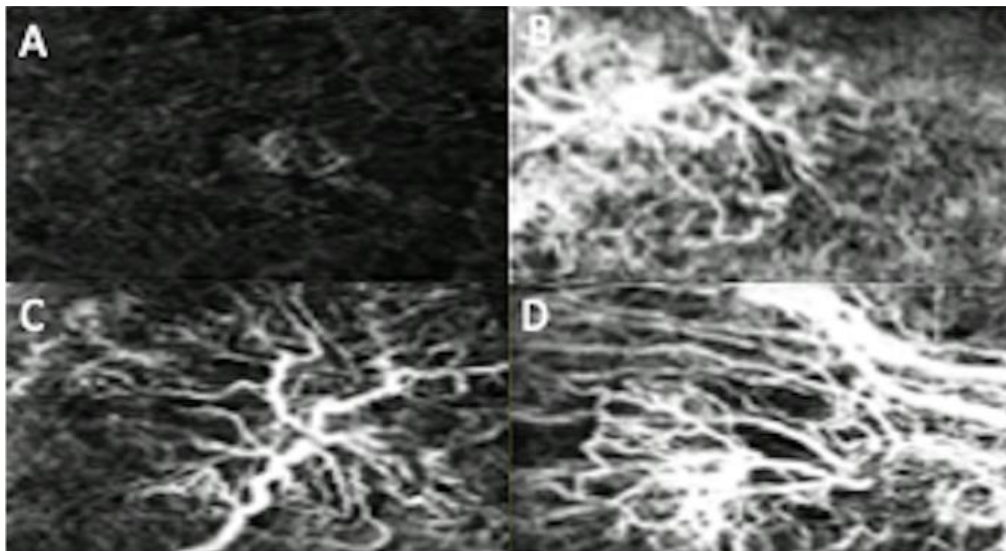


Figure 1: Optical coherence tomography angiography imaging showing examples of macular neovascularization phenotypes: non-specific (A), medusa (B), deadtree (C), tangled (D)

[Read More](#)



Student Theses -Optical Coherence Tomography News

Optical Coherence Tomography for Non-invasive Diagnosis of Basal Cell Carcinoma



By **Fieke Adan**
Maastricht University
Netherlands

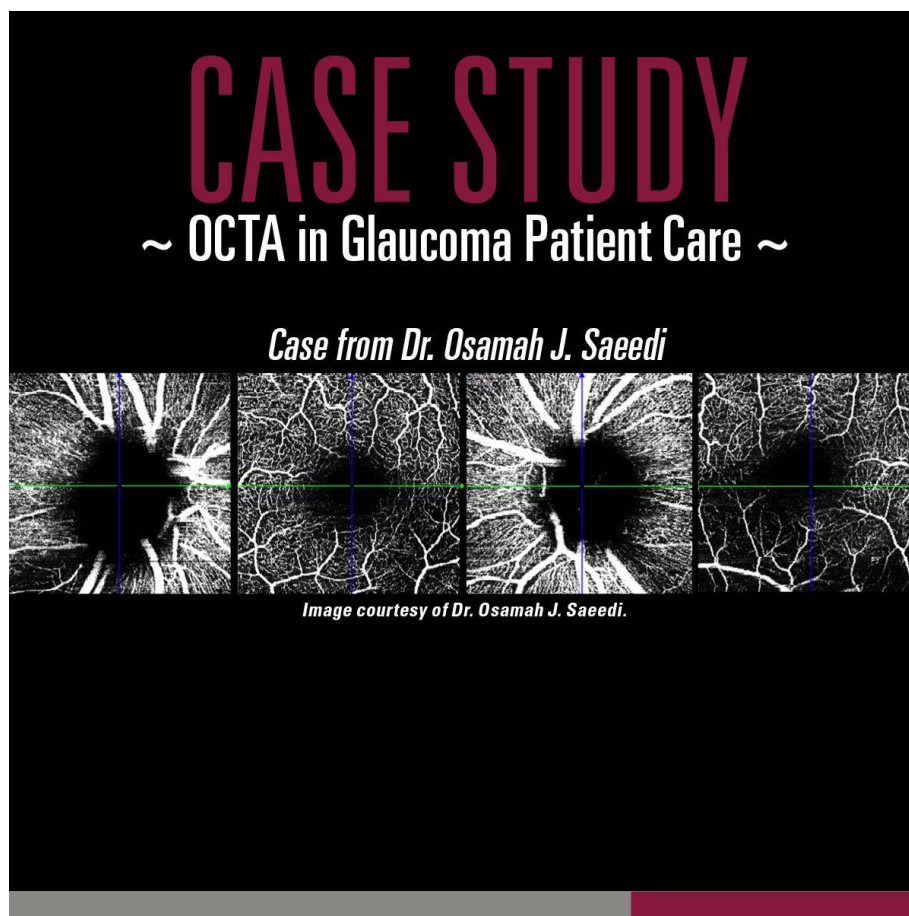
Aims of this thesis: The primary aim of this thesis is to evaluate optical coherence tomography as a non-invasive diagnostic method for diagnosis and subtyping of basal cell carcinoma. **Chapter 2** includes studies that aim at providing evidence as to whether OCT guided diagnosis and treatment of patients with clinical suspicion of BCC is non-inferior to regular care (always punch biopsy), leads to cost reduction and is preferable to biopsy for patients. **In Chapter 3**, the possibilities for application of OCT in Mohs surgery and specific populations are explored. **Chapter 4** consists of studies that seek to find out how BCC diagnosis with OCT can be improved. [Read More](#)

DOI: [10.26481/dis.20230203fa](https://doi.org/10.26481/dis.20230203fa)



Spectralis OCTA Imaging Reveals Significant Vascular Changes Before Significant Structural or Functional Glaucomatous Damage – Case Study

Routine use of OCTA in glaucoma patient care can help identify vascular changes before significant structural or functional glaucomatous damage. If OCTA is not part of your routine examination, [read about this interesting case](#) from Dr. Osamah J. Saeedi.



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[Get a career at NKT Photonics](#)

Did you know that **NKT Photonics** are leaders in high-power lasers for the new generation of commercial quantum computers? Their customers make all kinds of mind blowing innovations with their fiber lasers and photonic crystal fibers – and they need to keep up.

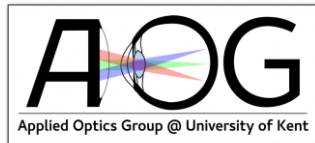
Their customers also use their **lasers and fibers** in areas such as **medical and life-science research, semiconductor manufacturing, and space exploration.**

Innovation is in their DNA. **NKT Photonics are pioneers of supercontinuum lasers and photonic crystal fibers,** and they constantly reimagine how their products can be used and improved.

NKT Photonics embrace uniqueness. With more than 30 nationalities, they are a diverse group. But they have a lot in common. They are curious, respectful, and aim to make a difference in the World. **NKT Photonics needs the sharpest minds in the industry to help us accelerate development.**

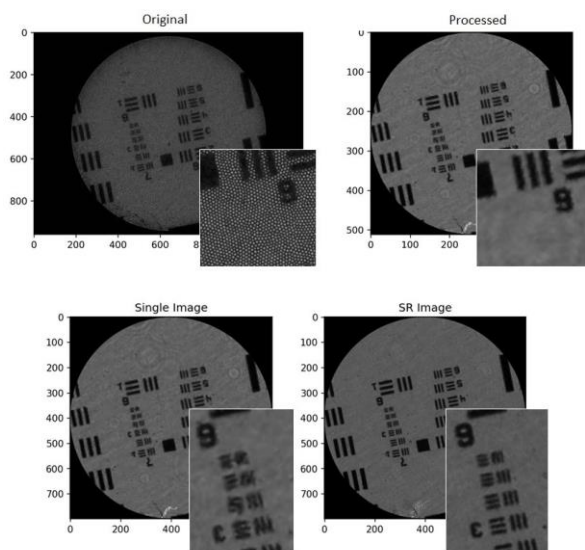
Join them! Together, you can make an impact.

See their vacancies [here](#).



PyFibreBundle

A Python package for working with **fibre bundle imaging**, has been updated to release 1.1.0. The package includes basic bundle handling (location, core identification etc.), core removal by various methods, including triangular linear interpolation, mosaicking and core super-resolution. **Latest release now has core super-resolution** integrated into the PyBundle class and allows high speed processing.



Everything is optimised for real time (video rate) use, including using Numba JIT compiler.

Github: <https://lnkd.in/er63V8cj>

Docs: <https://lnkd.in/eEFqjc73>

or pip install PyFibreBundle

[#fiber](#) [#fibre](#) [#fiberbundle](#) [#fibrebundle](#) [#imaging](#) [#python](#) [#endomicroscopy](#) [#KentPhysics](#) [#AOG Kent](#)

Developed in [Applied Optics Group](#), School of Physics and Astronomy, [University of Kent](#) for the work on endoscopic microscopy (**PhD available** - contact [Dr Michael Hughes](#) at m.r.hughes@kent.ac.uk if interested).





Call for papers

Special Issue

"Applications of Optical Coherence Tomography in the Ocular Diagnosis 2.0",

to be published in the journal Diagnostics (ISSN 2075-4418, IF 3.992).

Dr. Claudio Iovino, Dr. Valentina Di Iorio and Dr. Michele Lanza are serving as **Guest Editors** for this issue

This Special Issue aims to create a multidisciplinary forum of discussion about the clinical and research applications of these technologies (OCT and OCTA) in the ocular diagnosis of different subfields of ophthalmology. Innovative applications of optical coherence tomography in every ophthalmic field will be very welcome. **Submissions of high-quality original research articles showing new developments and innovative findings regarding these topics are especially welcome**, but there will be also considered high-interest review articles and case series/case report of exceptional merit.

For further reading, please follow the link to the Special Issue Website at:

[MDPI | Institutional Open Access Program](#)

The submission deadline is 25 August 2023. You may send your manuscript now or up until the deadline. Submitted papers should not be under consideration for publication elsewhere. also encourage authors to send a short abstract or tentative title to the Editorial Office in advance (diagnostics@mdpi.com).



Call for papers

Special Issue

“High-Performance Optical Coherence Tomography”

to be published in the Journal Photonics:

Journal: Photonics (ISSN 2304-6732, IF 2.536)

Special Issue: **High-Performance Optical Coherence Tomography**

Research works on **high-performance OCT system** like **SSOCT, FFOCT, OCTA, Dynamic OCT, Doppler OCT**, etc., including optimization methods for the imaging system, algorithm optimization for improving the resolution, imaging range, and special applications in medical diagnostics, industrial inspection, and model construction.

Research works on novel techniques for generating **swept lasers**, including **Fourier domain mode locked laser, time-stretched swept laser, swept laser based on frequency shift, dispersion tuning swept laser, short cavity swept laser based on MEMS**.

Guest Editors:

Dr. Dongmei Huang @Hong Kong Polytechnic University, China,

Dr. Peng Xiao @Sun Yat-Sen University, China

Dr. Zhenhe Ma @Northeastern University, China

Submission Deadline: 30 September 2023.

Link: https://www.mdpi.com/journal/photonics/special_issues/OW13645599



CONFERENCE

Optics and Photonics Days (OPD) 30th May – 1st June 2023, Joensuu, Finland

Optics and Photonics Days (OPD) is an annual central event in the area of Optics and Photonics in Finland. OPD2023 will be held at [University of Eastern Finland](#) (UEF), 30th May – 1st June 2023, Joensuu, Finland.

OPD2023 offers an unique opportunity to learn from interesting presentations, network with companies, students and researchers in the **field of photonics and optics**, but also to **explore products and services in OPD Exhibition** that is held during the conference.



The conference will cover all aspects of Optics and Photonics, however, the main topics for sessions ([more details here](#)) this year are:

- Integrated Photonics
- Sensing and Imaging
- Emerging active material and devices
- Quantum technology

Typographical instructions for the submissions are listed in the abstract template, which is available in Microsoft Word -format and LaTeX-format. The maximum length for the abstract is 1 page. The template for submission is available here: [Submission template for OPD](#).

Deadline for abstracts submission is postponed to March 10th

Registration and submission portal [Here](#). Minimum requirements for submission are:

- Submission type select (preferred oral or poster presentation),
- All authors, email addresses and organizations; list of authors must be identical to the submitted pdf-file,
- Title of Contribution,
- A short summary of the work (max 3 000 characters)



OPTICS & PHOTONICS NEWS



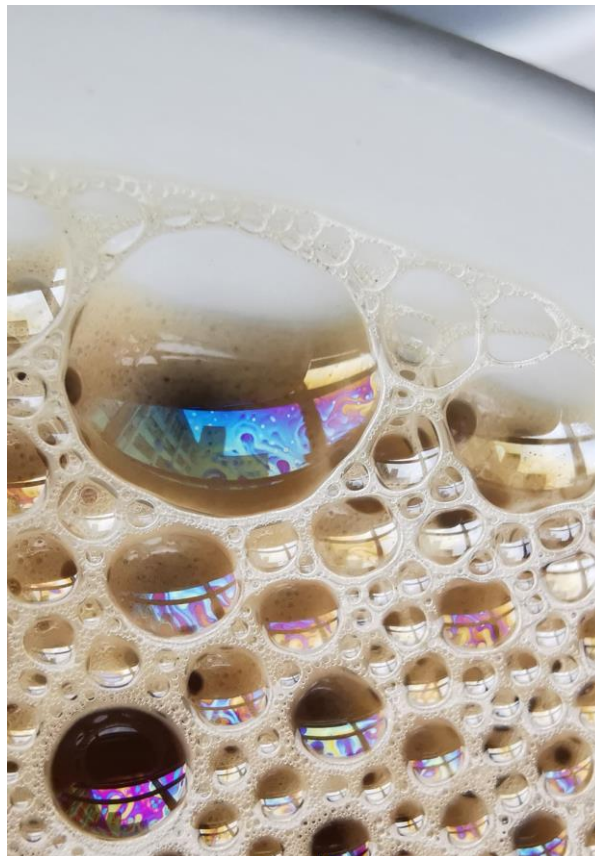
[Optics & Photonics News Magazine](#) [February 2023 Issue](#)

- [Wanted: Optics and Photonics Technicians](#)
- [Meet Optica's 2023 Fellows](#)

[Browse all Issues](#)

Image of the Week

Striking images of optics and photonics, contributed by OPN readers



Coffee Interference

Images of the blue sky above a university building, reflected in coffee bubbles, are magically colored by destructive thin-film interference of the spectral parts of the daylight (complementary colors).

—Aliaksei Kobylinskiy, University of Applied Sciences Jena, Jena, Germany



OPTICS & PHOTONICS NEWS

Optica Foundation Announces 2023 Ambassadors

The Optica Foundation announces **ten exceptional early-career members who will serve as the 2023 class of [Optica Ambassadors](#)**. Selected by previous honorees based on demonstrated volunteerism and mentorship skills, these emerging leaders will provide guidance and advice to a global network of young optics and photonics researchers.

“Since 2016, our Ambassadors have provided career advice, technical knowledge, and mentorship for our student members,” said Michal Lipson, 2023 Optica President. “Our guiding principles of inclusivity, impact, and innovation are embedded in this program to reinforce our core values in the next generation of scientists, engineers, and corporate leaders.”



[Mitchell Cox](#), [University of the Witwatersrand](#), South Africa
[Benjamin Cromey](#), [Ball Aerospace](#), USA
[Perla Viera Gonzalez](#), [Autonomous University of Nuevo León](#), Mexico

Supported by the foundation’s [annual fund](#), Ambassadors visit student chapters, provide training at meetings and share their insights on webinars. The new inductees are expected to promote the importance of a diverse and inclusive photonics ecosystem spanning academia to industry.

The 2023 Ambassadors are:

[Joshua Burrow](#), [Brown University](#), USA
[Atrouli Chatterjee](#), [Yale University](#), USA

[Sejeong Kim](#), [University of Melbourne](#), Australia
[Kseniia Minakova](#), [National Technical University](#), Ukraine
[Matthew Posner](#), [Optonique](#), Canada
[Falko Schmidt](#), [ETH Zurich](#), Switzerland
[Mateusz Szatkowski](#), [Wroclaw University of Science and Technology](#), Poland



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](#).



[Coming Soon!](#)

Silicon Photonic Integrated Circuits

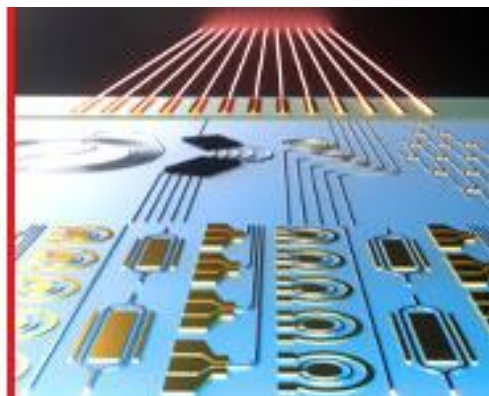
A variety of communication and sensing applications require higher levels of photonic integration and enhanced levels of photonic performance. Recently, materials advances have enabled significant gains in the performance of lasers, modulators, photodetectors, and photonic integrated circuits on silicon. Professor John Bowers of UC Santa Barbara will discuss the advances, applications, and the future of silicon photonic integrated circuits.



Presented by John Bowers, Professor, UC Santa Barbara

John Bowers holds the Fred Kavli Chair in Nanotechnology and is the Director of the Institute for Energy Efficiency and a Distinguished Professor in the Departments of Electrical and Computer Engineering and Materials at UCSB. Dr. Bowers received his M.S. and Ph.D. degrees from Stanford University and worked for AT&T Bell Laboratories and Honeywell before joining UC Santa Barbara. He is a cofounder of Nexus Photonics, Quintessent, Aurion, Aerius Photonics, Terabit Technology and Calient Networks. His research is in silicon photonic integrated circuits and in narrow linewidth and low noise semiconductor lasers on silicon.

[**Click to Register!**](#)



Silicon Photonic Integrated Circuits Enable a Variety of Applications



NORBLIS

NORDIC BROADBAND LIGHT SOLUTIONS

[NORBLIS](#) (Nordic Broadband Light Solutions) is a Danish start-up company spun out from the Fiber Sensors and Supercontinuum group at the Department of Photonics Engineering, Technical University of Denmark.

The company was founded in 2018 and is based on the shared expertise of the four founders within

- **Drawing optical fibers**
- **Fiber Lasers**
- **Supercontinuum Generation**
- **Mid-infrared Photonics**
- **Optical Coherence Tomography**
- **Spectroscopy and Imaging**

The vision of [NORBLIS](#) is to become **the first supplier of compact, broadband, mid-infrared supercontinuum fiber lasers reaching beyond 10 μm** , and to integrate these sources into solution-oriented systems for **applications in optical coherence tomography, infrared spectroscopy, and imaging**.

Read more about their [applications](#) and check their [products](#). A list of publication can be found [here](#).

R&D PROJECTS AND COLLABORATION

NORBLIS are very **open towards collaboration and development projects**. They believe that the best results are achieved through pooling together knowledge and resources to achieve a common goal. **Feel free to contact them at contact@norblis.com for any inquiries regarding R&D projects and collaboration.**

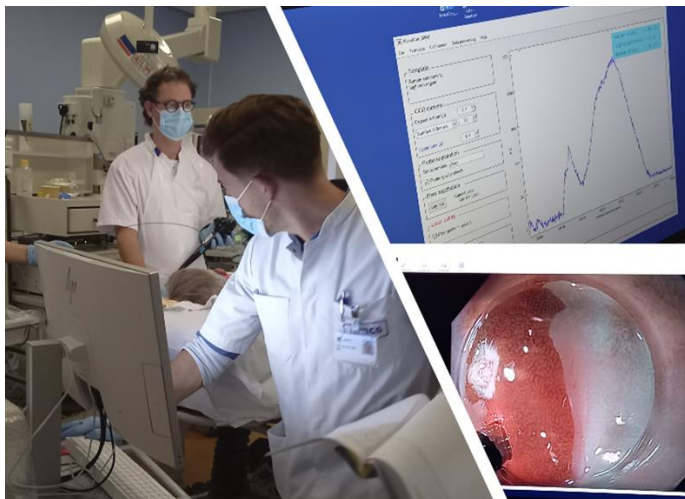


RiverD's fiber-optic Raman technology platform

Fiber-optic *in vivo* Raman spectroscopy for targeted biopsy and guidance of various treatment modalities (such as laser angioplasty and tumor resections) was first suggested over 30 years ago.

The idea is appealing. A real-time non-destructive technology for *in vivo* molecular tissue characterization. The potential for implementation in clinical procedures is endless. Many papers have appeared in the peer-reviewed literature.

Unfortunately, technological hurdles have proven difficult to overcome; first and foremost the challenge posed by the intense signal background generated in the fiber optic probe material. It has resulted in complex (expensive) probe designs and issues with reproducibility. The field is moving, but widespread clinical use of fiber-optic Raman spectroscopy has not been realized yet. **RiverD is on a mission to make *in vivo* fiber-optic Raman spectroscopy simple and reliable.**



No more technological hurdles to worry about. Just high quality tissue Raman spectra, ready for real-time tissue characterization. A shoebox-sized prototype module has been developed, to which single-fiber probes are connected for high-wavenumber Raman spectroscopy; one single fiber to guide laser light to the tissue and to collect Raman scattered light from the tissue. It does not get simpler than that.

The prototype system is currently in use in a feasibility study at the [University Medical Center in Groningen](#), the Netherlands and performing wonderfully. The study, part of the EU-sponsored Sensitive project, focuses on endoscopic screening of the esophagus and the colon.

With this development RiverD aims to enable the realization of many potential medical applications of fiber-optic Raman spectroscopy. Have ideas or questions?

Contact them at info@riverd.com, or via the contact-page on their website www.riverd.com



Penn scientist Nader Engheta wins the Benjamin Franklin Medal



University of Pennsylvania scientist [Nader Engheta](#) has been selected as a 2023 recipient of the [Benjamin Franklin Medal](#), one of the world's oldest science and technology awards.

The laureates will be honored on April 27 2023 at a ceremony at the Franklin Institute in Philadelphia.

“Professor Engheta’s **pioneering work in metamaterials and nano-optics** points the way to new and truly revolutionary computing capabilities in the future,” says University of Pennsylvania President [Liz Magill](#).

“As a scientist and a Philadelphian, I am deeply honoured and humbled to receive the Franklin Medal. It is the highest compliment to receive an award whose past recipients include some of my scientific heroes such as [Albert Einstein](#), [Nikola Tesla](#), [Alexander Graham Bell](#), and [Max Planck](#).

I am very thankful to the [Franklin Institute](#) for bestowing this honor upon me.”

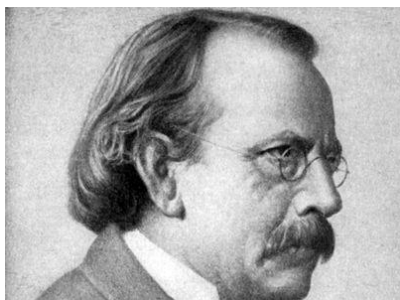
Engheta founded the field of **optical nanocircuits** (“optical metatronics”), which merges nanoelectronics and nanophotonics. He is also known for **establishing and developing the field of near-zero-index optics and epsilon-near-zero (ENZ) materials with near-zero electric permittivity**. Through his work he has opened many new frontiers, including **optical computation at the nanoscale** and **scattering control for cloaking and transparency**. His work has far-reaching implications in various branches of electrical engineering, materials science, optics, microwaves, and quantum electrodynamics. [Read More](#)



Did you know?

A Nobel Prize laureate who really enjoyed his afternoon tea was a British physicist [Joseph John Thomson](#) (18 December 1856 – 30 August 1940). Thomson was awarded the 1906 Nobel Prize in Physics for his studies of cathode rays which culminated in the discovery of the electron and was knighted in 1908. If you have to chance to travel to London, Thomson is buried in Westminster Abbey.

When he became the leader of the research students at the Cavendish laboratory at University of Cambridge, **Thomson established a daily tea time welcoming all research students for a tea break**. The tea break supposedly became an important ritual during the day at the laboratory. This gave the research students an opportunity to discuss ideas freely on topics such as science and politics. Many students were later grateful for these breaks where Thomson both engaged in their research as well as in their well-being.



More about Thomson:
<https://lnkd.in/epQ4WJZc>
and
[Joseph John “J. J.” Thomson | Science History Institute](#)

Thomson was also a teacher, and several of his students also went on to win Nobel Prizes. **His Nobel Laureate students include [Rutherford](#), [Aston](#), [Wilson](#), [Bragg](#), [Barkla](#), [Richardson](#), and [Appleton](#)** - a group who amongst themselves laid the most important bricks of particle physics. Interestingly **JJ's son [George Thomson](#)** also went on to win a Nobel Prize in Physics. However George's thesis supervisor was [Prof John Strutt](#) and not his father.

More more on [Extraordinary Professor: JJ Thomson and his Nobel Prize Factory | Probashi \(probashionline.com\)](#)



11th February 2023 - International Day of Women and Girls in Science

The Marie Skłodowska-Curie Actions have a vital role in supporting Europe's progress towards gender equality in research and innovation. On the [International Day of Women and Girls in Science](#), they spoke to **three MSCA fellows** about women leadership and empowerment in science:



1. What is missing are women leaders - [An interview with Portuguese researcher and MSCA fellow Joana Carvalho](#) on winning awards, role models, becoming a mother and gender equality in academia.



2. Women-led research is essential on the path to a sustainable future – [interview with Slovakian scientist and MSCA fellow Katarína Juríková](#) is a strong advocate for better conditions for researchers and innovators. Her wish is to make education and research more gender-inclusive.



3. Remember every day that you are powerful and needed – [interview with Spanish-Chilean astronomer and MSCA fellow Teresa Paneque Carreño](#) believes that science is popular and should be present on every platform, including social media and children's books.

Read More

[Celebrating the International Day of Women & Girls in Science 2023 | Marie Skłodowska-Curie Actions \(europa.eu\)](#)

Happy International Day of Women (IWD) and Girls in Science to everyone!



Celebrating the International Day of Women & Girls in Science 2022 | Marie Skłodowska-Curie Actions (europa.eu)

The [**Marie Skłodowska-Curie Actions**](#) support researchers of all nationalities, in all research areas, at any stage of their careers to take part in excellent research projects. Since its creation, the programme has placed a strong emphasis on promoting gender equality.



Read More about [Supporting women in research](#)

Read Marie Skłodowska-Curie Actions [Newsletter](#)
[Subscribe to Marie Skłodowska-Curie Actions' Newsletter](#)





Vice-Chancellor's (VC's) Cup success University of Kent

Congratulations to the three PhD students [Julien Camard](#) (AOG PhD student) and [Carla Canedo Ribeiro](#) (Biosciences PhD student) and [Alejandro Martinez Jimenez](#) (NETLAS PhD student) from the Division of Natural Sciences who recently **won 'The Cube' VC's Cup** on 6th February 2023.



The winners of the competition: **Julien Camard** (photo left), **Carla Canedo Robeiro** (photo middle) and **Alejandro Martinez Jimenez** (photo right)

This was an event based on the original TV show, in which contestants completed a series of challenges without losing all their lives.



[Read More on Kent Sport News](#)



[Alejandro Martinez Jimenez](#) said: “We are thrilled to update you on the latest happenings in the University of Kent's inter-departmental staff tournament, the Vice-Chancellor's Cup. This exciting event saw teams from all departments gather and compete in a series of thrilling activities to emerge victorious.

The Natural Science division had its own team, **DoNATS (Do Natural Sciences)**, comprising 15 individuals in the whole division. Unfortunately, only three team members, Carla, Julien, and myself, all working on OCT, could participate in the end.

The tournament comprised eight games, including **Walk of Faith**, a communication skill game that required a team member to navigate a circular path blindfolded. **Campus Coasters**, which tested the staff's knowledge of the Canterbury campus by identifying buildings and matching them to historical figures.

The Mind, a non-verbal communication and faith game, tested the staff's mind-reading abilities, while **Speed Stack** was a high-tension, reaction-based game that involved stacking cups into a pyramid and collapsing them down in the quickest time. **Silent Hangman, Candle Blow, Cards, and Human Knot** were other exciting games that kept the teams engaged.

The **quarter-finals** involved a game of '**dart catch**,' where the fastest teams to catch their dart advanced to the semi-finals. Team Liquorice All Sports showed their commitment and bravery, even after a teammate's poor aim resulted in them taking one to the forehead! Unfortunately, teams Liquorice All Sports, Campus Sporting Exploits, Kent Business School, and Finance missed out on the qualification.

The **semi-final** saw four teams compete in a nerve-racking series of **Jenga stacks**. ToMORA Never Dies finished in 4th place, while Living La Vida Mocha collapsed into 3rd place. This left only **two teams standing- DoNATS and Kent Union**- who competed in a final series of '**Ball flick**' challenges to determine the victory. After a tough and close three rounds, **DoNATS** finally took the win, leaving Kent Union relegated to 2nd place.

The Vice-Chancellor's Cup was a thrilling event that brought staff members from different departments together to showcase their skills and team spirit”.



Carla Canedo Robeiro said: “After some sports events, being at the Cube was an intriguing challenge. As I did not watch the show beforehand, I did not know what to expect. **Julien and Alejandro had an excellent performance and amazing teamwork.** We were not expecting to move that forward, but we kept focused while enjoying all the games during the event. In the last game, for a moment we thought that we had lost. When they announced that DoNATS won, we could not believe it!”

Julien Camard said: “The Cube was a peculiar mix of mini-games requiring agility, team work and quick thinking. We had so much fun with the team! As the night went on we started to get a little competitive (just enough to try our best without killing the fun!).

We successfully passed the Nerf gun bullet catching game in quarter finals, the jenga tower challenge in semis and reached the final, where a tight ball flicking contest awaited us! We were even after the first two legs against Kent Union, and Carla brilliantly won the last one. We instantly jumped into each other arms, celebrating with frenzy! We were really proud to report to the rest of the DoNATS VC Cup squad. We rarely win an event, but we hope this isn't the last!”



@Photos by Julien Camard

Congratulations to Carla,
Alejandro and Julien!!!



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