



42nd Newsletter of the ITN:

**“NEXt Generation  
of Tuneable LASers for optical  
coherence tomography”**

**(NETLAS)**

led by University of Kent



January 2024



# Welcome to NETLAS

## RA1: Dixon Sajan

Host: **Technical University of Denmark** (DTU)

01/12/2023 -31/11/2024

**Research Project:** Characterization of SOA from network partner Superlum Ireland for swept wavelength lasers

Dixon graduated from the International School of Photonics, CUSAT, Cochin, Kerala, India, with 5 year integrated MSc in photonics.



Dixon did his master's thesis at [Tampere University](#), Finland, where he continued working as a research assistant. The work there was based on the **Remote Alpha project** under the supervision of Prof. Juha Toivonen.



## Welcome to NETLAS

### RA2: Syed Ameer Hamza Zaidi

Host: **Technical University of Denmark** (DTU)

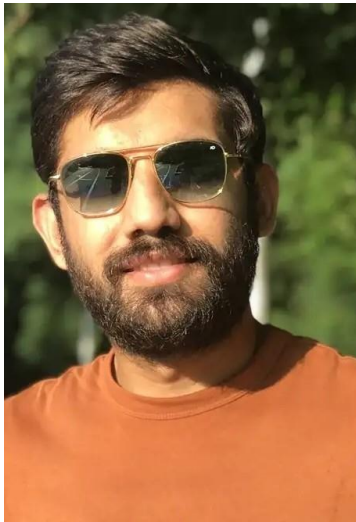
01/12/2023 -31/11/2024

#### **Academic Background:**

Master's in Optical Engineering, Sejong University, Seoul, South Korea  
2021-2023.

**Master's Thesis:** *"High-resolution Optical Coherence Tomography System using a Multi-level Diffractive Lens".*

**Bachelor's Degree:** Electronics Engineering, Bahria University Islamabad, Pakistan, 2015-2019.



**Master Thesis** was based on **Development of 4 SOA based wideband swept laser source** for OFDI system for high axial resolution; **designing and fabrication of micro-OCT probe for EDOF** and better lateral resolution; **designing and development of swept laser source medical imaging with Fresnel lens-based micro-OCT probe; high-resolution swept-source optical coherence tomography using a multi-level diffractive lens.**

#### **Professional Experience:**

After the master, Syed worked for one year in the industry at VALMAX Technology Corporation and research institute in South Korea, 2023-January 2024.



# Welcome to NETLAS

## RA3: Syed Farhan Ali Naqvi

**Host :** Innolume, Germany

01/12/2023 -31/11/2024

**Research topic: Tunable sampled grating (SG) distributed Bragg reflector laser diode for Optical Coherence Tomography**

Recently, an akinetic swept source principle has been introduced to the OCT field. The wavelength tuning principle is based on the Vernier tuning effect and allows full electronic control of the sweep. Since no mechanical elements are employed, linear tuning with high reproducibility can be ensured even at high tuning speeds of several hundred kHz. The basic laser structure is a multi-section Sampled Grating Distributed Bragg Reflector (SGDBR) laser diode. The 20-30nm wavelength range is achievable with quantum well designs that are standard at INNO. I am working on the development of the next generation SGDBR, with increased tuning range at Innolume GmbH.



### **Academic Background:**

**Master's Degree (2021-2023):** Optical Engineering, Sejong University (South Korea)

**Master's Thesis:** Development of swept laser source with a wide band tuning range (200 nm) for Optical Coherence Tomography (OCT)

**Bachelor's Degree (2015-2019):** Electrical Engineering, Comsats University Islamabad (Pakistan) 2015-2019

### **Professional Experience**

**Researcher:** I have worked as a researcher in optical engineering department at Sejong university from 2021-2023. My role also involves the designing and fabrication of catheters comprised of micro fiber-based lens and gold mirrors. In addition to the development of swept laser source for OCT, I have also got the opportunity to work on the Optical wireless charging project using SOA and EYDFA as gain mediums & Retroreflector based integrated Photovoltaic cells as the receiver to wirelessly transfer the power up to 30 meters range.



## Last secondment at the University of Kent for Sacha Grelet (ESR 12)

Sacha Grelet was recruited by NKT Photonics, Denmark

Secondment: University of Kent, Applied Optics Group (AOG)

**06/11/2023 – 22/12/2023**

Never give up! After the sudden interruption of his last secondment in December 2022 due to a laser failure, Sacha returned to the Applied Optics Group in November 2023. Over the course of two months, he collaborated with Alejandro Martinez Jimenez (ESR 13) on **demonstrating the potential of the time-stretched supercontinuum pulse swept-source for MHz OCT. They successfully obtained retinal volumes at 10 MHz and non-biological volumes at 80 MHz.**

“I am very proud of our achievements in the last few months,” Sacha said. “I would like to thank the AOG for hosting my research again and providing a friendly, inspiring workplace. My thanks also go to Prof. Podoleanu for his continuous support and our lengthy discussions. Last but not least, thank you, Alejandro, for your never-ending enthusiasm.”



@photos by Alejandro (left) and Ramona Cernat (right)



Congratulations to NETLAS ESR  
[Ifte Khairul Alam Bhuiyan](#) from Tampere University  
for the best oral presentation award

NETLAS ESRs [Ifte Khairul Alam Bhuiyan](#) and [Philipp Tatar-Mathes](#) together with their supervisors, Prof. Adrian Podoleanu, Dr. George Dobre, Prof. Mircea Guina and other colleagues from Tampere University attended the **2<sup>nd</sup> International Conference Advances in 3OM: Opto-Mechatronics, Opto-Mechanics and Optical Metrology** between 11–14 December 2023.



The conference took place in Timisoara, in the Western part of Romania, honouring the International Day of Light (IDL) 2023 and celebrating more than 100 years of the Polytechnic University of Timisoara.

**More information about the conference and Book of abstracts [can be found here](#)**

[Conference programme](#)

[Plenary and Invited Speakers – Advances in 3OM – 2023](#)

[\[3om-group-optomechatronics.ro\]](http://3om-group-optomechatronics.ro)





@photos by Ifte, Prof. Podoleanu and Prof. Guina

**Ifte said:** “Attending the 3OM conference in Romania during 11-14 December 2023 was a **transformative experience, where I delved into the forefront of laser-based technologies and gained profound insights into the potential applications of Opto-Mechanical technologies.** My conference attainments include significant insights gained through my role as a doctoral researcher at Tampere University and NETLAs consortium, where my focus lies in the investigation of mid-infrared semiconductor broadband light sources for optical coherence tomography (OCT). Moreover, **the conference has provided a platform for networking and knowledge exchange, fostering collaborations and discussions that have enriched my research endeavors.**



Nevertheless, I was very impressed at Romanian culture, foods and their friendly attitude. It was never possible to make without encouragements from Professor Mircea Guina from Tampere University. The conference ended with valuable advice from Professor Adrian Podoleanu concerning my secondments at Kent, getting knowledge of mid-IR OCT application in dentistry from Prof. Virgil-Florin Duma and receiving a great piece of appreciation from my conference oral presentation.” Photos from the conference will follow.



@photos by Ifte, Prof. Podoleanu and Prof. Guina





## Conference SPIE Photonics WEST 2024

**27 January – 1 February 2024**  
**San Francisco, California, United States**

❖ Paper 12830-125

### Using complex master-slave protocol for OCT with bidirectional sweeping laser

**Presenter:** [Alejandro Martínez Jiménez](#), Univ. of Kent (UK)

❖ Paper 12904-24

### Bidirectional 1310 nm MEMS VCSEL

**Presenter:** [Esteban Andres Proano Grijalva](#), Technical Univ. of Denmark (DTU, Denmark)

Unfortunately [Masoud Payandeh](#) (DTU, Denmark) didn't get the visa to attend the conference.

**Esteban said:** *“This year I was fortunate to participate again in Photonics West in San Francisco, USA. It has been great to meet again some friends from the Applied Optics Group in Kent and I also had the opportunity to meet friends from my bachelor's and master's after a long time. The conference has been good so far and I look forward to presenting my project about optimization of high contrast gratings on Thursday 1<sup>st</sup> February 2024”.*



Good luck Esteban and Alejandro!  
Enjoy the conference and San Francisco for  
the 2nd time within NETLAS!

### Other presentations from AOG

❖ Paper 12830-48

[Multiscale OCT imaging for high-throughput assessment of oocytes and embryos](#)

Presenter : **Julien Camard**

Univ. of Kent (United Kingdom), Conceivable Life Sciences (United Kingdom)

❖ Paper 12830-127

[Off-axis divergent sample illumination and reference wave for full-field fiber bundle optical coherence tomography](#)

Presenter

**Hal Dorrington**

Univ. of Kent (United Kingdom)

❖ Paper 12820-28

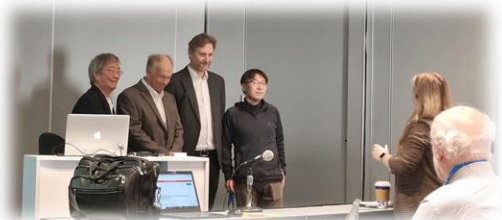
[Improved depth range and resolution of inline holographic microscopy through fiber imaging bundles](#)

Presenter

**Michael R. Hughes**

Univ. of Kent (United Kingdom)

Good luck everyone!



@ Photos by Alejandro and Esteban



UNIVERSITÄT ZU LÜBECK

[Institute of Biomedical Optics](#)  
[Biomedical imaging and laser technology](#)

## Winter Visit in Lübeck: Labs, Laughter, and Glühwein

“Three of the fifteen ESR of NETLAS recently visited me in Lübeck, and our time together was nothing short of delightful. The city was blanketed in snow, providing the perfect backdrop for our shared adventures, which included building a snowman and reveling in the wintry charm. They had timed their visit perfectly as the enchanting Christmas market had just begun, adding an extra layer of magic to our experiences. Lübeck's Christmas market, renowned for its breathtaking decorations and festive atmosphere, proved to be one of the most beautiful settings for our gatherings.

During their stay, **I took my friends on a tour of our labs at the university, giving them a firsthand look at the ongoing research and innovations within our collaborative projects. It was a great opportunity to blend professional insights with personal connections.**

Evenings were spent in warm camaraderie, sipping Glühwein and reminiscing about our PhDs. The trip was a perfect mix of scientific exploration and genuine friendship, leaving us with fond memories and a strengthened bond as members of the European NETLAS consortium.

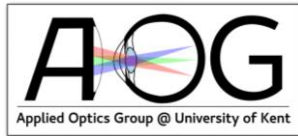
Thanks to Alejandro Martinez Jimenez, Sacha Grelet, Philipp Tatar-Mathes, and Carla Canedo Ribeiro for visiting”.

@ Article by [NETLAS ESR Marie Klufts](#)





@Photos by Marie Klufts

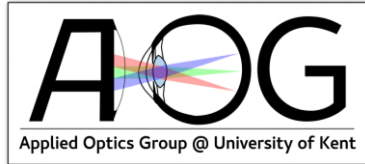


## Visit to University of Porto, Portugal

On January 10<sup>th</sup> 2024, [Dr Manuel Marques](#) (lecturer in Applied Optics, Univ of Kent) gave a presentation on the recent work from the Applied Optics Group at the [University of Porto SPIE student chapter's Scientific Meetings](#) in Portugal. Speaking to a mixed audience of MSc/PhD students and academics, Manuel introduced the fundamentals of low-coherence optical imaging, leading into optical coherence tomography, and **highlighted some of the latest advances in the field, in particular those from Kent's AOG**. A few photos from the event will follow.



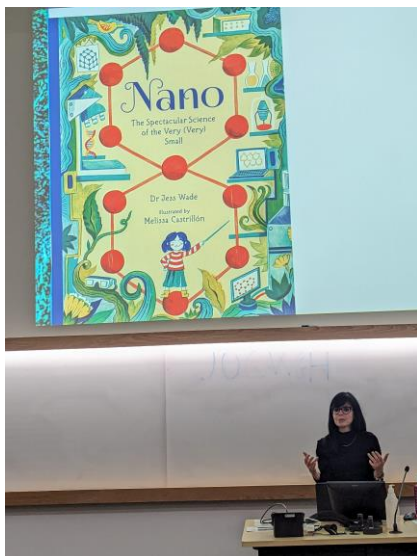
@ Photos by Manuel Marques



## AOG Visit

On January 23rd 2024, [Dr Manuel Marques](#), lecturer in Applied Optics, Univ of Kent, hosted [Dr Jess Wade](#) from Imperial College London, part of the Kent Physics Centre talks which are community-focused evening lectures, sponsored by the Institute of Physics. The event took place at 7 pm in Sibson building, University of Kent, and was open to all interested in Physics. Before the evening presentation, Jess visited the AOG's labs and had the privilege to meet some PhD Students and Postdocs who were happy to share their research interested and results. Jess's presentation was about *Chiral molecular materials and changing the world*. **Summary:** *Working together, physicists, chemists and materials scientists can create more efficient and sustainable technologies. Chiral molecular materials offer unparalleled opportunity in optoelectronic, spintronic and quantum technologies due to the unique combination of the optical, electronic, and magnetic properties. Technological breakthroughs of this scale are only possible when diverse teams of people work together, which means we need to do more to inspire, educate and celebrate scientists from all backgrounds.*

A few photos from the event will follow.



@Photos by Manuel Marques





## University of Kent and Discovery Park Collaborative Innovation Showcase

**11<sup>th</sup> January 2024**

A showcase of some of the University of Kent's flagship research and industry partnerships was hosted at [Discovery Park in Sandwich on January 11<sup>th</sup> 2024](#). The research showcased achievements made possible through the Universities' [UKRI Impact Acceleration funding](#). **The event brought together over 100 attendees from academia and industry to celebrate achievements and explore future possibilities.** Also attending the event were AOG members [Alejandro Martinez-Jimenez](#), [Lucy Abbott](#), [Taylor Sanderson](#), [Dr Radu-Florin Stancu](#), [Dr Adrian Bradu](#) and [Professor Adrian Podoleanu](#).

Dr Stancu and Professor Podoleanu both presented their own research posters at the event, titled **"Improvements in Optical Fiber Based Distance Sensor Fabrication for Ophthalmic Micro-Surgery Integration"** and **"Optical Coherence Tomography (OCT): Versatile Technology for Biosciences"** respectively, both of which sparked lively discussions with other attendees.

The talks consisted of topics from leading researchers in fields beyond our own as they were primarily chemistry and biosciences. This offered valuable insight into other disciplines and was a great opportunity to broaden our understanding and see different approaches taken towards research.

More information about the event and the individual talks can be found [here](#).

**@article by Taylor Sanderson**





*Photograph taken by Taylor Sanderson*

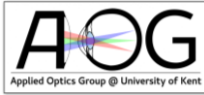


From left to right: Lucy Abbott, Dr Adrian Bradu, Taylor Sanderson, Professor Adrian Podoleanu, Dr Radu-Florin Stancu and Alejandro Martinez-Jimenez



## New PhD Position in KENT

University of  
**Kent**



**PhD Optical Tomography (OCT) and Deep  
Learning for Breast Cancer**

### About the Project

**We are recruiting for a fully funded PhD Studentships in Optics/Photonics/Physics/Artificial Intelligence for a period of 36 months within the Applied Optics Group (AOG)**, Division of Natural Sciences, University of Kent. The position is supported by the University of Kent and is associated with the MRC grant: **Quantitative OCT-Raman spectral imaging for intra-operative detection of positive margins in breast conserving surgery, a collaboration with University of Nottingham.**

OCT, due to its non invasive and high resolution capabilities of imaging the tissue has evolved into a versatile, highly professional diagnostic method. Research will focus on innovative solutions for multi view imaging of biopsies and combination of OCT imaging with Raman investigation.

About half of the PhD work will consist of **developing deep learning techniques for the interpretation of breast cancer images**. We will look at the most efficient preparation and pre-processing of the images. This will be followed by a meta-analysis of existing classifiers of breast cancer images. Finally, **we will take a data-centric approach to automate interpretation of the images**. The systems assembled will generate data that will enable health care providers to supply cost-effective, targeted treatment, not currently possible with conventional technology. [Read More](#)

### Criteria

**The applicant must have a good background in theoretical and experimental optics and expected to have graduated Physics (Optics) or Electrical and Electronic Engineering. We are looking for a highly imaginative and self-motivated individual with expertise in optics, digital signal processing and programming languages such as LabVIEW, MatLab or C++. Knowledge of Python and TensorFlow is essential.**

**For more information, you may contact Professor Adrian Podoleanu**

at A.G.H.Podoleanu@kent.ac.uk, School of Physics and Astronomy or Professor Philippe de Wilde at P.Dewilde@kent.ac.uk, Division of Natural Sciences, University of Kent.

### How to apply

For further information and details on how to apply, please visit

<https://www.kent.ac.uk/scholarships/search/FNADAOGOCT01>

### Deadline

**Applications must be received by 29 February 2024, 23:59 GMT**



[Siloton](#) is on a mission to leverage the latest advancements in integrated photonics to improve the global population's health

## Photonics engineer/integrated photonics engineer required

Bristol-based health tech start-up Siloton seeks a **skilled and innovative individual who is interested in applying their photonics engineering skills to improve the lives of people with eye disease.**

### Role overview

Your role will be to work on their hardware deliverables as part of the larger engineering team to create the **next generation Siloton OCT device**. Your primary responsibilities will be to work with the CTO and complete the technical workload of this deliverable, including but not limited to:

1. Simulating and designing photonic and optical systems, including photonic integrated circuits (PICs)
2. Construction and testing of optical systems
3. Establishing alignment/characterisation/assembly procedures
4. IP generation
5. Testing, characterising, and demonstrating the functionality of existing and new photonic chip devices
6. Constructing and demonstrating prototype imaging devices
7. Liaising with collaborators and suppliers

### How to apply

Please send a CV and cover letter to [recruitment@siloton.com](mailto:recruitment@siloton.com).

Applicants will be interviewed on a rolling basis so are encouraged to apply early.

Applicants must have the right to work in the UK. **Contract Type Permanent, full time**. Salary and compensation £45,000-£55,000 per annum depending on experience Company share options package Enhanced annual leave (25 days + bank holidays, with an extra day for each year of service up to 3 years) **Flexible working from home options** (where possible) Cycle to work scheme In-year employee reward scheme Paid sick leave Enhanced paternity/maternity cover

Any questions or queries on the role can be sent to [recruitment@siloton.com](mailto:recruitment@siloton.com)

**Start date As soon as possible.**



## **Postdoctoral position required**

In collaboration with the [Danish Research Center For Skin Cancer](#), **DTU Optical Sensing and Imaging Systems, Department of Health Technology** is building their team to promote non-invasive imaging in skin cancer research. They are looking for a candidate interested in imaging and image processing, working with patients, and learning about translating image devices to the clinic.

**International applicants are welcome!**

### **The job**

- Participate in the setup of new research projects in collaboration with other scientists
- Responsible for OCT and OCTA examinations of study participants
- Analyze and interpret imaging data
- Identification of biomarkers relevant to diagnosis, subtyping and management of skin cancer
- Develop standard operating procedures (SOPs) for clinical implementation
- Software development for feature identification in OCT and OCTA images
- Design, implement, and monitor studies in a clinical setting in collaboration with clinicians
- Write publications for scientific journals
- 

[More information about the job](#)

### **Salary and employment conditions**

The position is for 37 hours per week, with employment starting as soon as possible.

Salary and terms of employment in accordance with the current collective agreement in the field.

**Employment is a 1-year position with the possibility of extension.**

### **Contact**

Further information can be obtained from PostDoc Gavrielle Untracht, [greun@dtu.dk](mailto:greun@dtu.dk) or phone number +45 31325225

### **Application deadline**

**February 5, 2024.** Interviews will be conducted in week 7 and 9.





## PUBLICATIONS

Highlight of the year 2023, FDML at shorter wavelength, collaboration of 4 NETLAS partners led by University of Luebeck, Prof. Robert Huber (UzL), Superlum, Optores and UoKent

**828 kHz retinal imaging with an 840 nm Fourier domain mode locked laser**

Marie Klufts, Alejandro Martínez Jiménez, Simon Lotz, Muhammad Asim Bashir, Tom Pfeiffer, Alexander Mlynek, Wolfgang Wieser, Alexander Chamorovski, Adrian Bradu, Adrian Podoleanu, and Robert Huber

**Biomedical Optics Express, Vol. 14, Issue 12, pp. 6493-6508, (2023)**

<https://doi.org/10.1364/BOE.504302>

## Paper is Top 10 Downloads in December Biomedical Optics Express

### TOP DOWNLOADS: DECEMBER

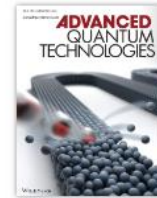
#### Biomed. Opt. Express

1. Fast Fourier ptychographic quantitative phase microscopy for in vitro label-free imaging
2. 828 kHz retinal imaging with an 840 nm Fourier domain mode locked laser
3. Evaluating the performance of OCT in assessing static and potential dynamic properties of the retinal ganglion cells and nerve fiber bundles in the living mouse eye
4. Label-free multimodal imaging with simultaneous two-photon and three-photon microscopy and kernel-based nonlinear scaling denoising

## Back Cover: Strain-Free GaSb Quantum Dots as Single-Photon Sources in the Telecom S-Band (Adv. Quantum Technol. 12/2023)

Johannes Michl, Giora Peniakov, Andreas Pfenning, Joonas Hilska, Abhiroop Chellu, Andreas Bader, Mircea Guina, Sven Höfling, Teemu Hakkarainen, Tobias Huber-Loyola

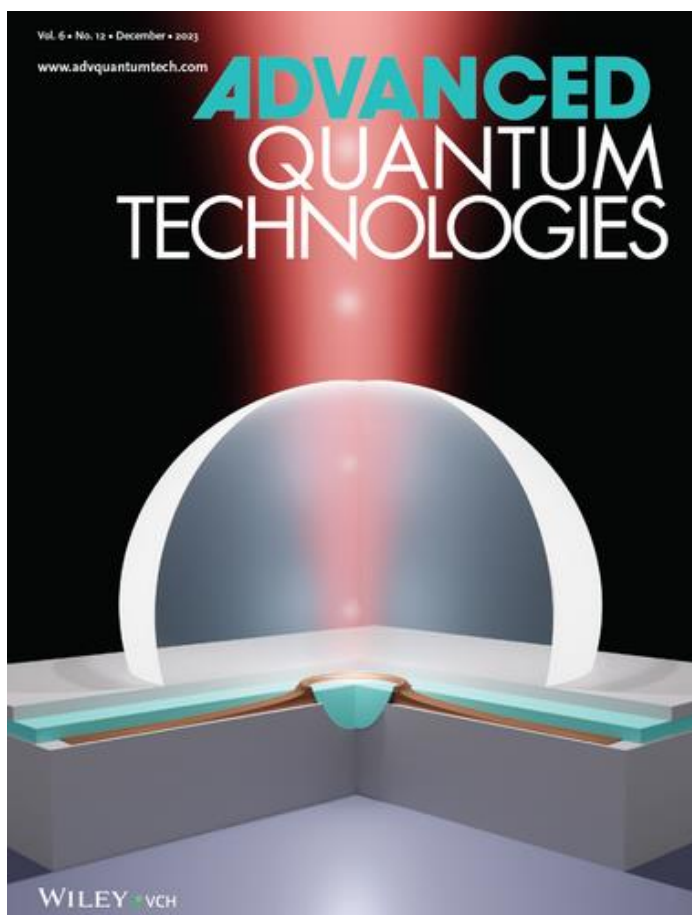
First published: 11 December 2023 | <https://doi.org/10.1002/qute.202370125>



Volume 6, Issue 12  
December 2023  
2370125

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<https://doi.org/10.1002/qute.202370125>



Strain-free gallium-antimonide (GaSb) quantum dots are fabricated via local droplet etching and subsequent nanohole infilling and investigated for their (quantum-) optical properties.

Time-resolved photoluminescence and second-order autocorrelation measurements are conducted on an excitonic transition, showcasing antibunching and thereby highlighting the material platform's potential as a resource for generating non-classical light in the telecom range.

More details can be found in article number [2300180](#) by Johannes Michl, Tobias Huber-Loyola, and co-workers.

# Photoacoustic imaging for cutaneous melanoma assessment: a comprehensive review

Joseph W. Fakhoury, Juliana Benavides Lara, Rayyan Manwar, Mohsin Zafar, Qiuyun Xu, Ricardo Engel, Maria M. Tsoukas, Steven Daveluy, Darius Mehregan, **Kamran Avanaki**

Journal of Biomedical Optics, Vol. 29, Issue S1, S11518 (January 2024).

<https://doi.org/10.1117/1.JBO.29.S1.S11518>

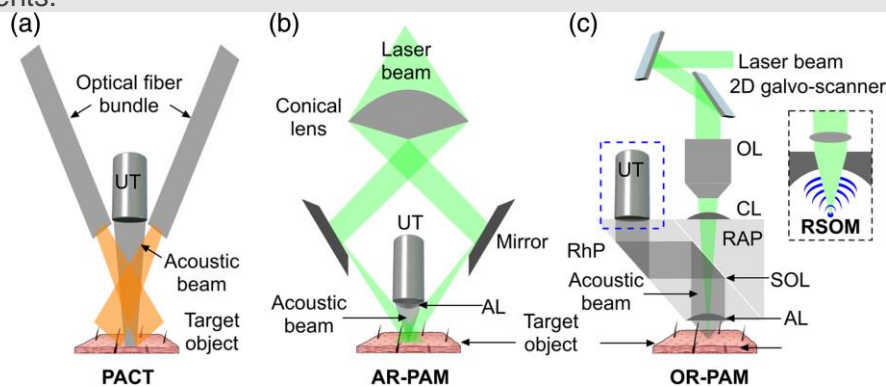
**Kamran Avanaki** former PhD Student under Prof. Podoleanu's supervision, now Associate Professor of Bioengineering at the University of Illinois at Chicago (UIC) said: "If you are involved in the field of skin melanoma imaging and are interested in exploring the advantages that photoacoustic imaging offers compared to other imaging modalities, please check out our recent in-depth review article. **This article is particularly important to me because it is part of a JBO special issue dedicated to honouring the career of my mentor, Dr. Lihong Wang**".

## Significance

Cutaneous melanoma (CM) has a high morbidity and mortality rate, but it can be cured if the primary lesion is detected and treated at an early stage. Imaging techniques such as photoacoustic (PA) imaging (PAI) have been studied and implemented to aid in the detection and diagnosis of CM.

## Aim

Provide an overview of different PAI systems and applications for the study of CM, including the determination of tumor depth/thickness, cancer-related angiogenesis, metastases to lymph nodes, circulating tumor cells (CTCs), virtual histology, and studies using exogenous contrast agents.



Different PAI configurations used for melanoma analysis: (a) PACT, (b) AR-PAM, and (c) OR-PAM (inset: RSOM). PACT, photoacoustic computed tomography; AR-PAM, acoustic-resolution photoacoustic microscopy; OR-PAM, optical-resolution photoacoustic microscopy; RSOM, raster scanning optoacoustic mesoscopy.



## Student Theses -Optical Coherence Tomography News

### Investigations in Jones matrix polarization-sensitive optical coherence tomography for dermatological imaging and characterization



By Sina Maloufi

University of British Columbia  
<http://hdl.handle.net/2429/86201>

**Summary:** Optical coherence tomography (OCT) is a non-invasive imaging modality that provides high-resolution, three-dimensional images of biological tissue. Since its introduction in the 1990s, it has gained widespread adoption in ophthalmology, and it has also garnered interest in other clinical applications, such as dentistry, endoscopy, and dermatology. More recently, functional extensions of OCT have been developed that allow not only for traditional structural imaging, but also for imaging with functional contrasts in polarization. Skin cancer is a prevalent health burden in the western world, and it is currently diagnosed primarily through an invasive biopsy. As a non-invasive imaging modality, OCT can potentially result in faster skin disease diagnosis and improve quality of care. Studies have shown that OCT can be successful in diagnosing skin cancers such as basal cell carcinoma and squamous cell carcinoma, but traditional OCT has had difficulties in diagnosing melanoma. The further study of OCT's functional extensions could solve this potential gap. **This thesis focuses on Jones matrix polarization-sensitive OCT (PS-OCT), which allows for the simultaneous acquisition of multiple contrasts in intensity, phase retardation, local birefringence, and degree of polarization uniformity (DOPU). Algorithms and methods developed for PS-OCT are explored and show that advanced quantification of skin properties is possible using polarization measurements. We were able to demonstrate that polarization-based measurements are more sensitive to roughness than traditional OCT, and that specific skin layers exhibit unique polarization properties.** Finally, **a clinical pilot study with 18 healthy volunteers is presented in this thesis.** Different skin locations in the body can be differentiated based on their polarization properties, and it is shown that PS-OCT is sensitive to changes related to aging. Additionally, case studies of eczema and vitiligo are examined with PS-OCT, and it is demonstrated that PS-OCT can differentiate features associated with both skin diseases. Our study shows that PS-OCT has high potential for applications in skin disease diagnosis.





## 15 Tools for PhD Thesis Writing

**These tools will reduce your thesis writing effort by 50%**

Advice from [Faheem UllahFaheem Ullah](#)

Assistant Professor | Australia |

1. **Overleaf** – For those who need to follow precise formatting standards, especially in STEM, this tool ensures your document adheres to LaTeX protocols with ease.
2. **Scrivener** – Construct a detailed blueprint of your thesis structure. This tool understands the complexity of long-form writing.
3. **Obsidian** – Link related concepts and notes with ease, creating a web of ideas that mirrors the interconnectedness of your thesis.
4. **Asana** – Plot out your thesis timeline, from proposal to defense. Each task is a building block towards your classic thesis.
5. **MS Word** – It's not just for typing up your thesis; utilize its tons of formatting tools to meet submission guidelines.
6. **Google Docs** – Collaborate in real-time with your advisor, get feedback instantly, and never worry about losing your work to a computer crash.
7. **EndNote** – Gather and manage all your references, and then insert them into your document in the correct format with just a few clicks.



**8. Mendeley** – Organize research papers, read and annotate on the fly, and automatically generate your bibliography.

**9. Notion** – Collect all your research notes, draft sections, and bibliographic references in one sleek space. It's your digital workspace that evolves with your thesis.

**10. OneNote** – Seamlessly sync notes across all your devices.

**11. Google Keep** – Quickly capture spur-of-the-moment ideas and categorize them with labels. Ideal for organizing thoughts on-the-go!

**12. Toggl** – Track every precious minute spent on each chapter or research activity.

**13. Todoist** – Pin down tasks for literature reviews, experiments, and writing deadlines. It's like a friendly nudge to keep your thesis milestones on track.

**14. Paperpal** - This tool can remove typos and grammar issues from your thesis. You can also trim and paraphrase using this too.

**15. Draw.io** - This is a free tool that you can use for drawing figures for your thesis.

Which tool helped you the most in your thesis writing?

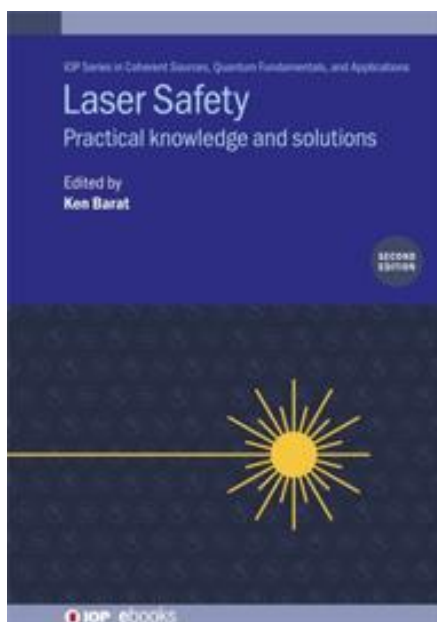
**Just pick the ones that work best for you!**



## Books & Reviews

### Laser Safety: Practical Knowledge and Solutions

by [Ken Barat CLSO](#) (Editor), [Mr Patrick Bong](#) (Contributor), [Mr Tom MacMullin](#) (Contributor)



***Laser Safety: Practical knowledge and solutions*** provides an in-depth guide to laser safety for a wide variety of people who work regularly with lasers and similar products. The authors provide useful techniques and methods to create a safe working environment for laser culture and answer a number of laser user concerns seldom addressed.

**This book will be relevant to students, researchers and laser physicists.** Since the production of the first laser in 1960, several new types of lasers and their technology have spread to all sectors of society.

**The innumerable properties of lasers are associated with some hazardous dangers to their users if safety measures are not taken.** For example, due to the coherence of the laser light, the laser power density which hits the eye is high, so any tissue in focus will be heated up and very quickly destroyed.

This book has answers to what, where, why and how laser safety has to be taken. The second edition has been updated with supplemental information and some new chapters have been added. **The book is a must-read for physicists, safety professionals, students and researchers who deal with lasers.**

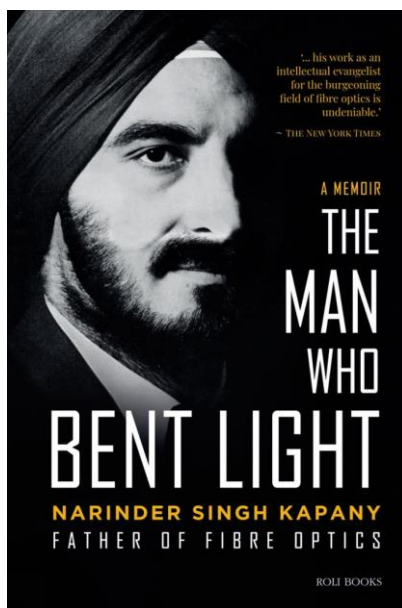
*Review by Reva Garg, Institute of Physics, University of Brasilia, Brazil*

Order the book [here](#)



## The Man Who Bent Light: Father of Fibre Optics

by [Narinder Singh Kapany](#) (Author)



The father of fibre optics, Narinder Singh Kapany was far more than your typical multi-hyphenate. Inventor, art collector, sculptor, farmer, entrepreneur, teacher, and a successful businessman, Dr Kapany was what Fortune magazine in its 1999 issue called, 'one of the seven unsung heroes of the 20th century'.

An insightful and inspirational life story, this memoir chronicles his 90 remarkable years. Charming, idiosyncratic, and highly engaging, ***The Man who Bent Light*** serves up enough variety and verve to celebrate the lives of a half-dozen individuals. But there is only one Narinder Singh Kapany, and his life, illuminated in his singular memoir, is a life like no other.

**About the Author: Dr. Narinder Singh Kapany** (1926–2020), widely known as the father of fiber optics, was born in Punjab and after graduating in India, moved to the Imperial College London for his doctorate. In 1953, working alongside Harold Hopkins at Imperial College London, Dr. Kapany **was the first to successfully transmit high-quality images through fiber bundles**. He coined the term fiber optics in a famous 1960 article for Scientific American. His breakthrough achievements helped create a foundational element of the internet age, affecting the lives and businesses of millions around the world. In 1961, Dr Kapany along with his wife moved to Woodside where he founded Optics Technology Inc. successfully taking it public in 1967. He was the first Sikh Indian to take a company public in Silicon Valley. [Read More](#)

Order the book [here](#)





# CONFERENCES

## 7th International Conference


### on Optics, Photonics and Lasers (OPAL' 2024)

**15-17 MAY 2024**

**PALMA DE MALLORCA (BALEARIC ISLANDS), SPAIN**



The conference is focusing any **significant breakthrough and innovation in optics, photonics, lasers and its applications**: read more [here](#)



**Extended Deadlines:**

- Submission (2-page extended abstract): **5 March 2024**
- Notification of acceptance: **20 March 2024**
- Registration: **10 April 2024**
- Camera ready (4-6 page paper or 2-page abstract): **15 April 2024**



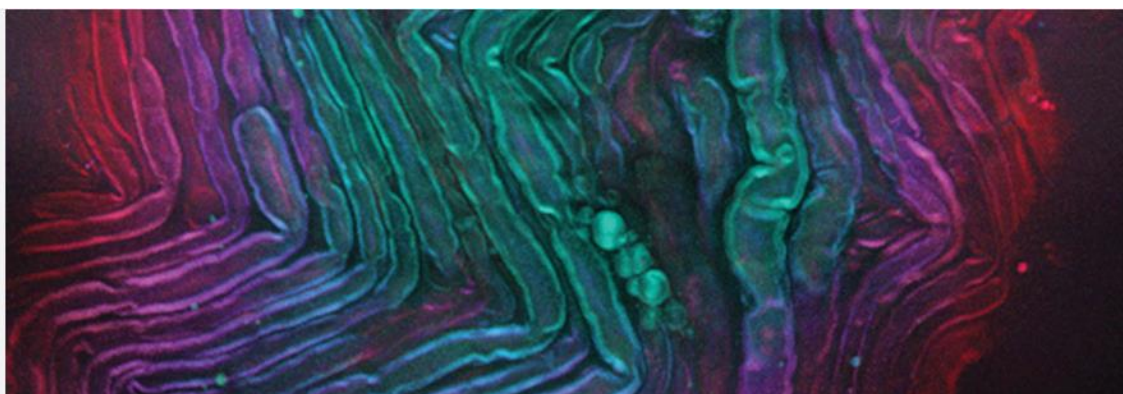
## Optica Biophotonics Congress: Biomedical Optics

**Fort Lauderdale, Florida USA, 7-10 April 2024**

**Topics central to this meeting are:**

- ❖ **novel OCT methods and technologies**
- ❖ **imaging probes and systems**
- ❖ **computational modelling**
- ❖ **image processing algorithms**
- ❖ **multimodal technologies**
- ❖ **basic and translational applications**

**Post deadline Abstract and Summary Submission Deadline: 19  
March 2024**



**SUBMIT PAPER**

Postdeadline Abstract and Summary Submission  
Deadline: 19 March 2024 12:00 Eastern Time (US &  
Canada) (UTC - 05:00)

# Submit Paper



## **The Siegman International School**

**The future of laser science and technology is ultrafast!**

**highly recommended for students in the field of optics to participate**

**At the Siegman School, you can learn from pioneering laser researchers and leading companies to kickstart your career and connect with new colleagues.**

**You'll get the opportunity to present your own research, hear from fellow students and gain exposure for your work.**

**Apply by 1 February to attend!**



The Siegman International School is a week-long **program that exposes students to in-depth learning of lasers and their applications from internationally recognized academic and industry leaders in the field.**

**The Siegman International School on Lasers covers all aspects of lasers and photonics.**

**Each summer up to 100 graduate students are invited to participate in a week-long program to learn from pioneering laser researchers and experts from leading laser companies, highly-regarded professors and fellow students. Attendees are asked to present their own research, which provides valuable experience in building exposure for their work all while building lifelong colleagues and friends.**

Anthony Siegman, after whom the school is named, was a past Optica president and member for 50 years. He prioritized not only technological advancements but also creating opportunities for learning and growth among students and future generations.

IPG Photonics partnered with the Optica Foundation and donors around the world to endow this program.



## 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](#).





## **Up Next!** The Search for Life Beyond Earth: How It's Done, Where It Stands, and Why It Matters

In just the last 10 years, we have learned that planets are ubiquitous and that so-called habitable-zone Earth-like worlds may number in the tens of billions in the Milky Way galaxy alone. The statistical probability that life has only emerged on one small and insignificant planet around a very ordinary star is zero! But – we have yet to find definitive proof. And yet the search for life beyond Earth is more than just an exercise in human curiosity. It is also an opportunity to discover ourselves in the process, to understand where we fit in, how we got here, and why we even exist. SETI Institute CEO Bill Diamond will describe the science behind the search for life beyond Earth and why it matters to humankind and indeed to all life on our own planet.



Presented by Bill Diamond, President and CEO,

SETI Institute

Bill Diamond is a Silicon Valley technology veteran and current President and CEO of the SETI Institute in Mountain View, California. The SETI Institute is a nonprofit astrophysics and astrobiology research and education organization focused on the study of life in the Universe. Prior to joining the Institute, Mr. Diamond held various executive management positions in applied technologies, most recently at the optical networking company, Oclaro, Inc. Mr. Diamond has over 30 years' experience in laser photonics and optical communications networks, X-ray imaging, and semiconductor processing technologies. His corporate background ranges from venture-backed start-ups to Fortune 100 multinationals, including CEO positions at WaveSplitter Technologies, Denselight Semiconductor (Singapore) and Xradia, Inc, (now part of Zeiss). He was also President of COMET Technologies USA, leading US operations for the Swiss COMET, AG corporation

Mr. Diamond holds a B.A. in physics from Holy Cross College and a Master's in Business Administration from Georgetown University. He is a past member of the Advisory Board for the McDonough School of Business Administration at Georgetown and is a current member of the Optical Society of America, the International Astronomical Congress and the American Association for the Advancement of Science. He also serves on the Board of Directors of the Bay Area Science and Innovation Council, BASIC, in San Francisco.

**Click to  
Register!**



The [SETI Institute's](#) Allen Telescope Array is a key part in their search for extraterrestrial intelligence.



**NETLAS Beneficiary SUPERLUM further extends 670 nm SLD portfolio**

Superlum is pleased to announce that **they had extended their 670 nm SLD portfolio** and added one new part number to the list: **S670.15.1**.

These SLDs had been developed specifically for applications where SLD spectrum width is more important than output power.

**Given a spectrum width of 15 nm,** their **coherence length** (FWHM of coherence function) is **estimated as less than 20 microns in the air.**

SLD modules **S670.15.1** are currently **available in stock**, ready for rapid, one-week shipment.

Please contact SUPERLUM Sales team **here** to learn more.



## In Memoriam Prof. Gabriel Popescu

**SPIE PW2024:** On behalf of the organizing committee, **SPIE PW2024** is announcing the **Gabriel Popescu Award** for the best paper and presentation at the **SPIE Quantitative Phase Imaging (QPI) conference at Photonics West's BIOS**. Gabi was a founder of the QPI conference, which began in 2015, helping to grow it into one of the largest conferences in BIOS. The selection of the finalists is ongoing and the winner will be announced at the end of the [QPI X session](#).

**Gabi's enthusiasm was contagious. He was a true leader and an inspiration to many colleagues and students, a distinguished researcher, mentor, educator, and an unforgettable friend. To honor Gabi's life work and legacy, was established the [Gabriel Popescu Foundation](#).** The Foundation helps organizing the competition at the QPI conference and accepts donations to provide a financial award to the winner. In addition, at future conferences, the Foundation may support a plenary speaker at the QPI session.

For more information about the Foundation mission visit:

<https://www.gabrielpopescufoundation.org/>

SPIE Photonics Europe is dedicating this [year's Unconventional Optical Imaging conference](#) to Gabi's memory. Gabi served as the conference chair 2018-2022.

JOSA A announced a Feature Issue on QPI in Gabi's memory, to honor Gabi's contribution to QPI and label-free imaging.

[https://opg.optica.org/josaa/journal/josaa/feature\\_announce/qpi.cfm](https://opg.optica.org/josaa/journal/josaa/feature_announce/qpi.cfm)



# **OTHER NEWS OF INTEREST TO THE NETLAS COMMUNITY**



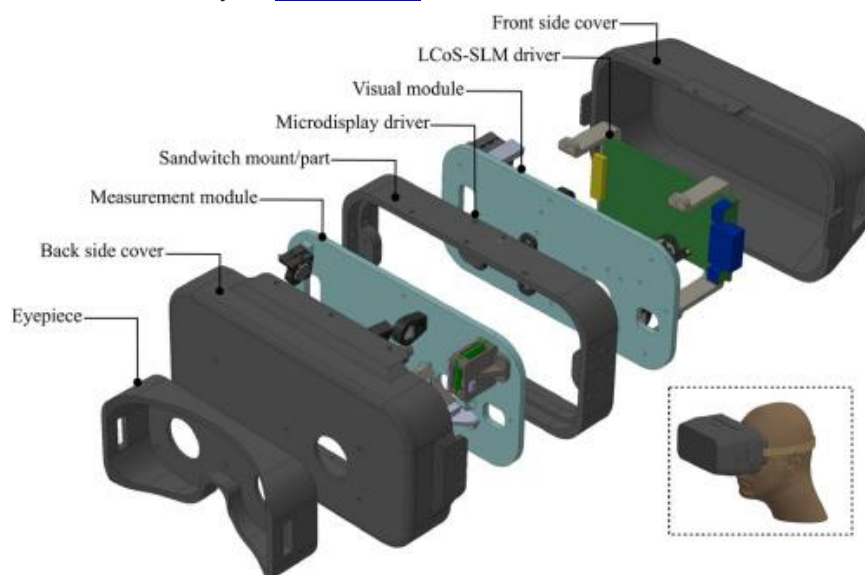
## PUBLICATIONS

### Head-mounted adaptive optics visual simulator

Shoaib R. Soomro, Santiago Sager, Alba M. Paniagua-Diaz, Pedro M. Prieto, and  
**Pablo Artal**

**Biomedical Optics Express**, Vol. 15, [Issue 2](https://doi.org/10.1364/BOE.506858), pp. 608-623, (2024)  
<https://doi.org/10.1364/BOE.506858>

Adaptive optics visual simulation is a powerful tool for vision testing and evaluation. However, the existing instruments either have fixed tabletop configurations or, being wearable, only offer the correction of defocus. This paper proposes a novel head-mounted adaptive optics visual simulator that can measure and modify complex ocular aberrations in real-time. The prototype is composed of two optical modules, one for the objective assessment of aberrations and the second for wavefront modulation, all of which are integrated into a wearable headset. The device incorporates a microdisplay for stimulus generation, a liquid crystal on silicon (LCoS) spatial light modulator for wavefront manipulation, and a Hartmann-Shack wavefront sensor. Miniature optical components and optical path folding structures, together with in-house 3D printed mounts and housing, were adapted to realize the compact size. The system was calibrated by characterizing and compensating the internal aberrations of the visual relay. The performance of the prototype was analyzed by evaluating the measurement and compensation of low-order and higher-order aberrations induced through trial lenses and phase masks in an artificial eye. [Read More](#)



**Fig. 2.** Customized housing assembly showing different parts of the instrument and their arrangement. The housing parts are custom-designed using 3D CAD tools and printed in-house on a fused deposition modeling (FDM) 3D printer.



# Did you know?

**COHERENT**

**VCSEL ARRAY**

Did you know that VCSELs (**Vertical-Cavity Surface-Emitting Laser**) are a tiny (**smaller than an ant!** 🐜) type of semiconductor diode laser that emits light vertically from the top of its surface rather than from the side?

Placed in arrays they are mostly used within sensing and communication applications, e.g. in vehicles.  
Read on about VCSELs and its applications



[What is a VCSEL Array? | Coherent](#)



## **15 MSCA PhD positions on BIOMEND Doctoral Network - Developing Bioabsorbable Metallic Endovascular Medical Devices (3-year PhD)**

BIOMEND is a [Marie Skłodowska-Curie Actions](#) (MSCA) Industrial Doctorate Network (DN) programme that will provide world-class interdisciplinary training to 15 high achieving doctoral candidates (DCs) in the area of BIOabsorbable Metallic ENDovascular Medical Devices (BIOMEND).

The consortium spans seven European countries and comprises of leading academic, clinical and industry experts to promote international, interdisciplinary and inter-sectoral aspects of DC skill development.

Successful candidates will undertake 3-year PhD programmes in the **area of endovascular medical device development**, co-hosted by academic, industry and clinical members of the consortium, with these positions starting from 1st June 2024.

The closing date for applications is **15 Feb 2024**.

Further details about the research programme, applicant eligibility criteria, DC projects and application procedure are provided in this document, with up-to-date information available on the BIOMEND website

[Application – BIOMEND Doctoral Network](#)

**Project details on EURAXESS:**

<https://euraxess.ec.europa.eu/jobs/181100>



# OPTICS & PHOTONICS NEWS



[Optics & Photonics News Magazine](#)  
[January 2024 Issue](#)

- [Timekeepers in Space](#)
  - [Waveguide Quantum Electrodynamics](#)
  - [Brilliant Idea or Big Headache?](#)
- 

[Browse all Issues](#)





## OPTICS & PHOTONICS NEWS

### **Foundation Ambassadors: Be a leader for the next generation**

**Application Information:** [How To Apply](#)

*Applications for 2025 will be available at [apply.optica.org](http://apply.optica.org) in the Summer of 2024.*

### **Important Dates**

**Opens 01 July 2024**

**Closes 30 September 2024**

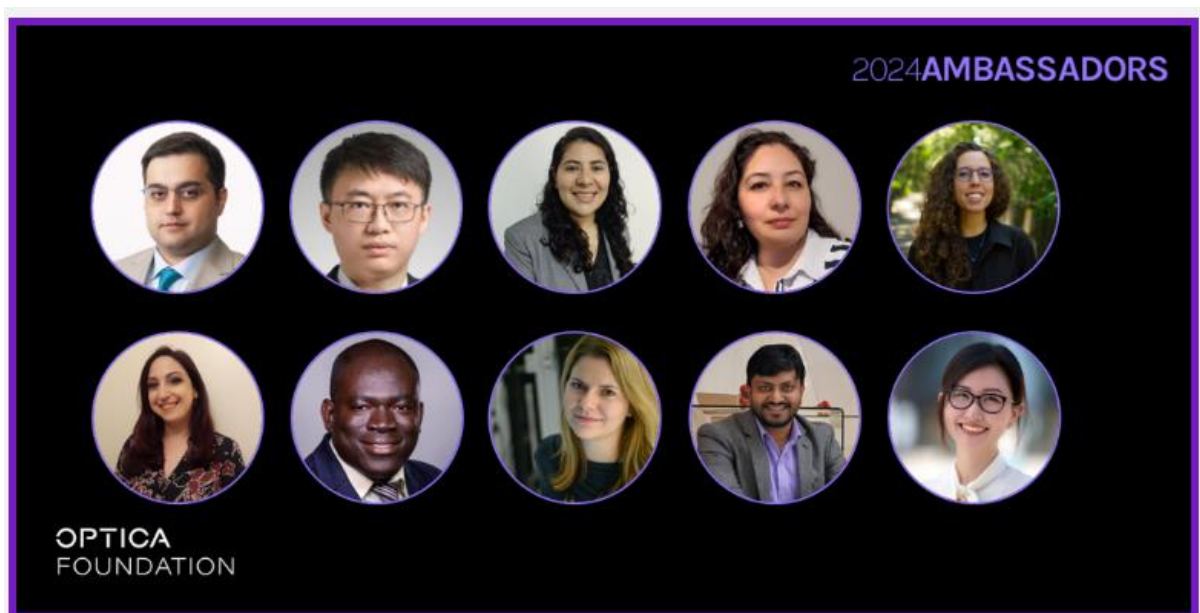
### **Applicant Requirements**

Be a current early career or an individual member who has received a terminal degree within the last five - seven years or will receive a terminal degree by the application deadline.

**Application Requirements:** check [here](#)

### **2024 Recipients**

Connect with this year's ambassadors for advice, networking or even just to say hello.





# OPTICS & PHOTONICS NEWS

## Spotting Trends in Optics and Photonics

**How to identify up-and-coming areas by looking at the big picture, from enabling science to vertical markets**

By Tom Hausken

Has this happened to you? Someone asks, “**What were the hot topics at the Optica conference you attended?**” You hesitate, or you recite a long, unhelpful list of disparate subjects. And what may seem new and significant to you may seem outdated or overhyped to others. So how do we identify burgeoning areas in the field?

### **Vertical markets drive everything**

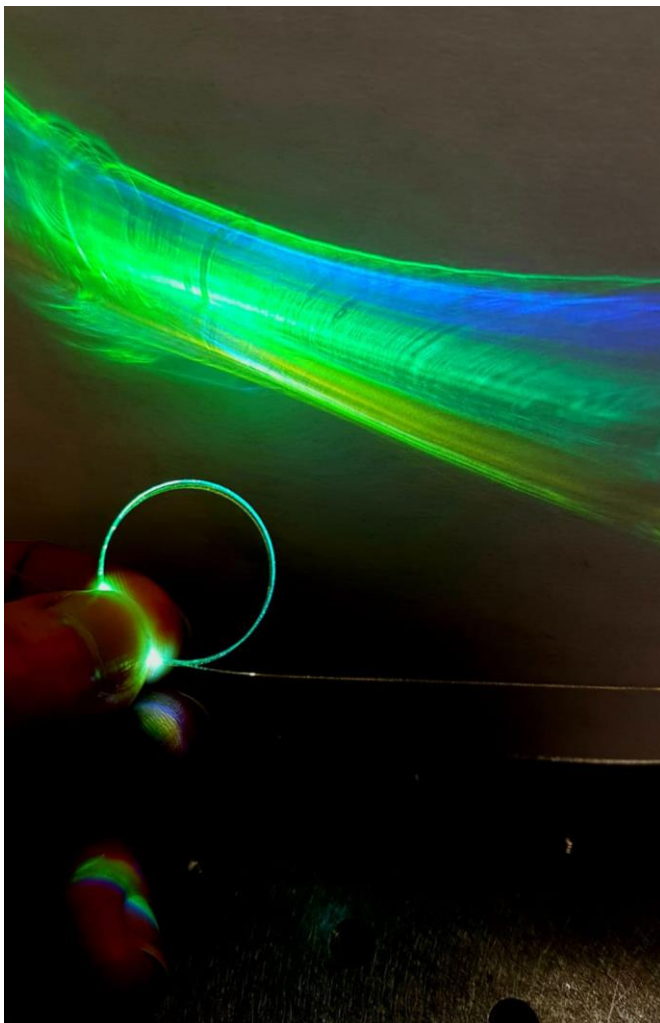
Start by recognizing trends in the vertical markets that are built on enabling sciences. Vertical markets deliver useful products and services to end users that address needs of society and bring returns to investors.

The figure shows how ecosystems of vendors deliver goods and services up supply chains to end users, while money flows in the other direction. **It identifies eight major verticals in optics and photonics**, but when choosing a market, ensuring that it matches your needs is more important than its size. The vertical market for equipment sold to research labs is relatively small (and not shown here), but it is valuable to the optics companies that sell into it.

It’s important to stay current on the key drivers that propel each vertical, from social trends and changes in public affairs to technical innovations. Interest in generative AI is driving investment in data centers that make new demands on optical interconnects. Apple, Meta, Microsoft and other consumer product vendors are promoting augmented- and virtual-reality devices that require new display technology. National initiatives like Made in China 2025, Germany’s Industrie 4.0 and the US CHIPS and Science Act steer public funds to particular manufacturing technologies that use optics and photonics. [Read More](#)

## Image of the Week

Striking images of optics and photonics, contributed by OPN readers



### **Resonant Bend Loss**

Image captured by coupling light from a supercontinuum source into a 3-m length of anti-resonant hollow-core fibers (ARFs) and then bending a section of the ARF into a tight bend diameter.

The bend corresponds to a critical bend diameter for blue, green and yellow wavelengths, causing the transverse loss of these wavelengths from the fiber. ARF fabricated by Leah Murphy and Stephanos Yerolatsitis at the University of Bath's fiber fabrication facility.

A white piece of paper was placed behind the fiber to capture the transverse loss of light.

[OPN 2023 Photo Contest  
Honorable Mention]

—Leah Murphy, University of Bath, UK

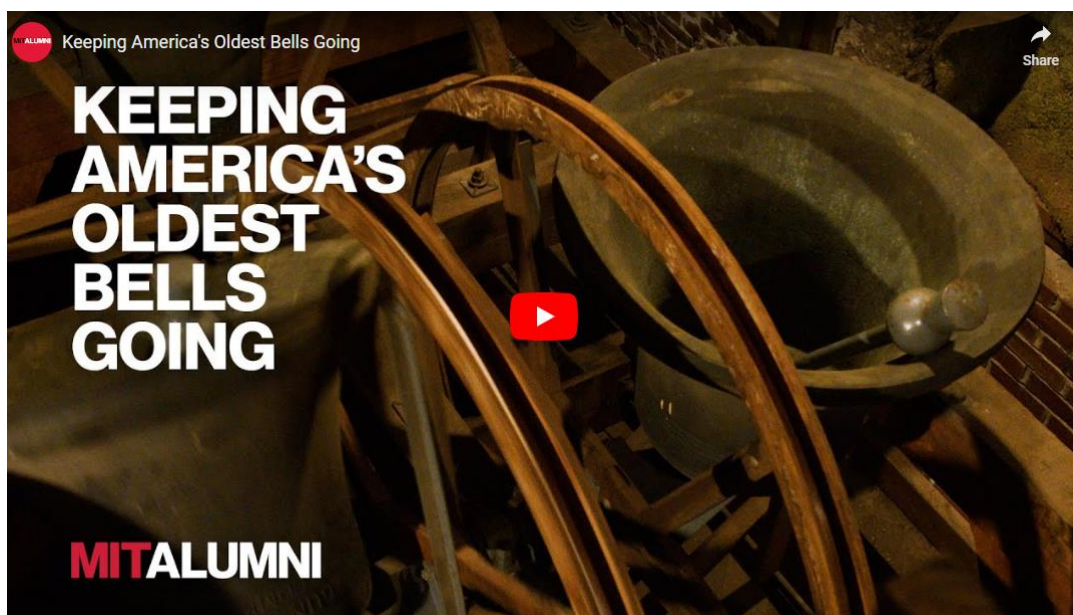


## MIT Guild of Bellringers Keeps America's Oldest Bells Going

By JULIE FOX, JAN 5, 2024

If you've ever walked through Boston's North End, you've probably seen the Old North Church or heard its ringing bells. **Cast in 1744, the bells are said to be the oldest in North America, and they are still rung by hand** thanks to a dedicated group of [MIT](#) affiliates—the [MIT Guild of Bellringers](#).

The guild, which has been the steward of the [Old North Church's bells](#) since the 1970s, practices a 1,000-year-old style of bell ringing called change ringing that started in the English countryside to call people to church. Change ringing involves multiple bells each rung by one individual to create a series of patterns, not songs.



Learn more about the MIT Guild of Bellringers in this [MITAA video](#).



**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](mailto:R.Cernat@kent.ac.uk) and to Adrian Podoleanu: [ap11@kent.ac.uk](mailto:ap11@kent.ac.uk)**