



## NETLAS NEWSLETTER 1-2023

**Happy New Year 2023 to all  
our NETLAS community & all  
those reading our monthly  
Newsletters!**



**[Why Does the New Year Start on January 1?](#)**



## SECONDMENTS

### Netlas PhD Student

**Alejandro Martinez Jimenez**

**Recruited by:** University of Kent, UK, **Applied Optics Group (AOG)**

**Secondment started on 20<sup>th</sup> June till 17<sup>th</sup> December 2022 at NKT Photonics, Denmark**

**Duration: six months**

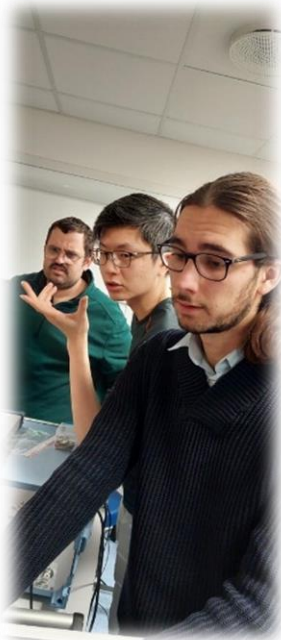


**Returning to Kent with two lasers in my suitcases & taking the plane**

**PhD Project:** Nonlinear polarization rotation laser followed by time stretch

.....and the secondment also comes to an end ☹️ At NKT Photonics I had the opportunity to learn from a great international and diverse research team. I would like to thank the hospitality of their entire research group called “Future Technologies”. After 6 months at NKT Photonics I accumulated a lot of experience from their researchers. Thanks for all the help and learning moments that I take now with myself, all these hours in the splicing room with Dung-Han and the theoretical moments with Rasmus Dybbro. These are moments that for sure I’ll never forget. Also I had the opportunity to show some of my research in the National Optical Conference in Aarhus, sharing with the team an amazing experience. Doing that I did understand the primary focus of the research group, which is to open novel venues in technology.

Last but not least I wish all success to everyone in the Future Technologies group and looking forward to see more of their research in the near future! Thank you everyone for making my secondment possible!!



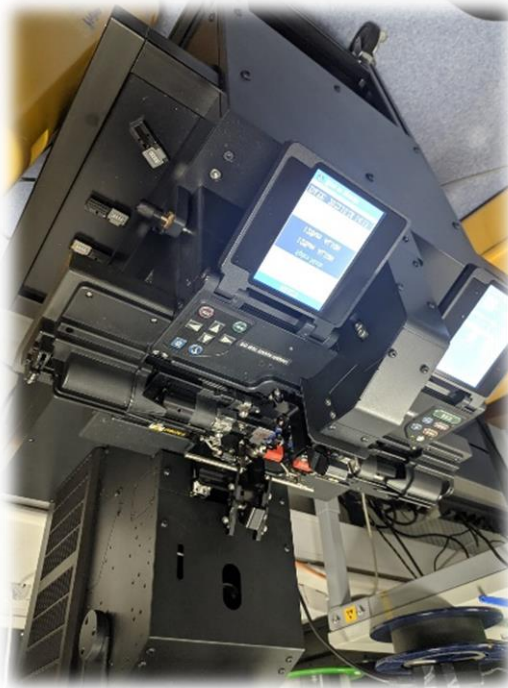
*From right to left,  
**Sacha Grelet,**  
**Dung-Han Yeh,**  
and **Alejandro**  
working in the lab  
trying to mode-lock  
the laser*



*NKT building in a snowy day!*



*Ytterbium fiber viewed  
from an IR viewer*



*New CO2 splicer in the labs  
where I spent a long time*

@Photos by [Alejandro Martinez Jimenez](#)



## SECONDMENTS

### Netlas PhD Student

#### [Gopika Venugopal](#)

**Recruited by:** University of Kent, UK,  
**[Applied Optics Group \(AOG\)](#)**

**Secondment started on 23<sup>th</sup>  
September till 2nd December 2022 at**  
Research Center for Materials  
Characterization and Non-Destructive  
Testing **[RECENDT](#)** GmbH , Austria

**Duration: two months**



#### **PhD Project: Multiple bands swept source using a fast scanner and multiple emitters**

I had a great time at [RECENDT](#), this secondment gave me an insight into how such organisation operates, giving importance to both being a company and a research facility. Though I encountered my own visa struggles reaching Austria for the secondment, I really enjoyed my stay in Linz. From being introduced to industrial applications of OCT and machine learning to exploring the country, everything was really interesting and fun. I was mainly working on characterising a wavefront division interferometric set-up for OCT applications and using it to image test samples. I would like to thank everyone at RECENDT for being so nice and welcoming. Special thanks to [Dr. Bettina Heise](#) and her OCT group for helping me in my work at the [NETLAS Associated Partner RECENDT](#), for all those German translations and suggestions for food to try and places to visit (and for personally taking me to some of the places). I would also like to thank my supervisors, [Dr. George Dobre](#) and [Prof. Adrian Podoleanu](#), for their constant support and help. My stay in Austria also gave me the opportunity to meet my friends after so long and spend some time with them. I was also able to explore some parts of the country, and I found them really beautiful. Here are some photos from my stay in Austria.





*Windischgarsten with Bettina*



*With OCT group at RECENDT*



*Mozart's Birthplace  
at Salzburg*



*Christmas market at Linz*



*Hallstatt*



*Pleschinger see, Linz*



*Hallstatt with my  
friends*



*Christmas market at Vienna*

@Photos by [Gopika Venugopal](#)



[NETLAS PhD Student Mojdeh Vakili Tabatabaei's](#)  
visit to Max Planck Institute for the Science of Light,  
Germany  
12-16<sup>th</sup> December 2022

Last month I had a chance to visit [Max Planck Institute for the Science of Light](#) (MPL) in [Erlangen](#) for part of the processing of my samples. I would like to take you on a short journey through it. I will write about some non-scientific and fun parts of my visit.



My journey started with snow, my first real snow experience in Germany

I was fascinated with the events that they hold regularly. I got the vibe that you can work and have simultaneously. For instance, every Monday one PhD student presents her/his work; this is a great opportunity to brainstorm and receive ideas from different perspectives. Every Friday, they discuss over breakfast, people bring what they enjoy or that belongs to their culture for others to taste. I was lucky to participate in Christmas party of the institute. It started with live music from a band formed by members of MPL. Toward the end of the event, there was a fun competition between research groups with the idea of making the tallest still standing tower out of cartons.



Fun competition between research groups at the Christmas party: who can make the tallest still standing tower out of cartons

Ok! And a word about where I worked at MPL. I was spending my whole day in the cleanroom, which was one of the best-organized and well-equipped labs which I had the chance to visit till now. Each section has a responsible person: an electrical engineer, a chemical engineer, a photonics engineer, and so on... bringing their expertise together: I find this type of collaboration is one of the key points to success.

At the end, I would like to thank my advisor [Prof. Sascha Preu](#) from [TUDa](#) for making this opportunity happen and all the lovely people at MPL especially [Dr. Florentina Gannott](#) and [Dr. Irina Harder](#) for their support and guidance.

I leave here a photo of me, fully covered and ready to start the work in the cleanroom.



@ Mojdeh Vakili Tabatabaei





## Optica Fair Event, University of Kent

On Tuesday 24<sup>th</sup> of January, '[The Big Fair](#)' was held by [Kent Union at University of Kent](#) to showcase a variety of societies they have to offer. As the [Optica Student Chapter](#) has recently become a society with Kent Union, a stall was held at this event for Applied Optics PhD students to share their activities and plans and to encourage interest in joining.

Being held in the University Sports Hall meant that everybody was protected from the cold outside, which made for a lovely environment for students to stroll around and see what's on offer. Participants from the [Optica Chapter](#) included [NETLAS](#) PhD Students [Alejandro Martinez Jimenez](#), [Philipp Tatar-Mathes](#), [Gopika Venugopal](#) and AOG PhD Students [Julien Camard](#), and [Lucy Abbott](#).

To encourage visitors to the stall the chapter provided an array of sweet treats as well as a fun game. The game was in the form of a whiteboard maze, but with a twist. **Participants were tasked with completing the maze whilst wearing prism glasses, inverting their vision.** Each participant was timed and **the fastest time won a prize** on behalf of the student chapter.



A friend of the student chapter, [Carla Canedo Ribeiro](#), after completing the maze game.  
Photo by Julien Camard.



PhD students [Gopika Venugopal](#) and [Lucy Abbott](#) representing the student chapter.

Overall the day was very successful and all who were there appeared to have a great time promoting and talking about optics. **The chapter looks forward to welcoming any new members who may arise from this event.** Hopefully, some new faces will appear at the next event, being a board game social on the evening of the 26<sup>th</sup>!

@Article by AOG PhD Student [Lucy Abbott](#).





## AOG rehearsal presentations for [Photonics West in San Francisco](#) (28 January - 2 February 2023)

### [NETLAS PhD Marie Klufts](#)

19<sup>th</sup> January 2023 at 1 pm

[NETLAS PhD Student Marie Klufts](#) rehearsed her talk entitled “**850 nm FDML: performance and challenges**” which was going to be presented at the Photonics West in San Francisco on 30<sup>th</sup> January 2023. Marie’s abstract, the date and the presentation time can be found in the conference program under [paper number 12367-9](#). A few slides from Marie’s rehearsal will follow.

Marie is also a **co-author** for another [paper number 12367-11](#) entitled “**1190 nm Fourier domain mode locked (FDML) laser for optical coherence tomography (OCT)**” which is going to be presented at the conference in the same day by her [Netlas](#) colleague [PhD Student Asim Bashir](#) (University of Lubeck).

The screenshot shows a Zoom window titled "Photonics West Conference 2023 Rehearsal presentations Marie and Alejandro". The main content is a presentation slide from the University of Lübeck, Institute of Biomedical Optics. The slide title is "850 nm FDML: Performance and Challenges". It lists the authors: Marie Klufts, S. Lotz, M. A. Bashir, T. Pfeiffer, A. Mlynec, W. Wieser, A. Chamorovskiy, V. Shidlovski and R. Huber. Contact information for Marie Klufts is provided: marie.klufts@uni-luebeck.de, +49 451 3101 3234, and www.bmo.uni-luebeck.de. The dates "28. Jan - 2. Feb 2023" are at the bottom. Logos for NetLaS, OptoRes, and SUPERLUM are also visible. On the right side of the Zoom window, there is a video gallery showing Marie Klufts (Guest) and Adrian Pod... (7). At the bottom right, there is a video feed of Marie Klufts (Guest).



Photonic West Conference 2023 Rehearsal presentations Marie and Alejandro

10:11 Request control Pop out People Chat Reactions Rooms Apps More Camera Mic Share Leave

UNIVERSITÄT ZU LÜBECK Institute of Biomedical Optics, University of Lübeck

### Typical applications of FDML lasers

**Optical coherence tomography (OCT)**

- SS-OCT with MHz repetition rate<sup>1</sup>
- 4D-OCT in a virtual environment (VR-OCT)<sup>2</sup>
- long range OCT<sup>3</sup>
- ...

**Other fields of application**

- sensing<sup>4</sup>
- TCO-Raman<sup>5</sup>
- picosecond pulse generation<sup>6</sup>
- SLIDE microscopy<sup>7</sup>
- microwave generation<sup>8</sup>
- LiDAR<sup>9</sup>
- spectroscopy<sup>10</sup>
- ...

SLIDE microscopy (Karpf et al.)

marie.klufts (Guest)

18:16 Request control Pop out People Chat Reactions Rooms Apps More Camera Mic Share Leave

UNIVERSITÄT ZU LÜBECK Institute of Biomedical Optics, University of Lübeck

### Dual Amplification FDML Laser

**Double the gain in each round trip**

- Find the right timing
- Sweep coming back to the filter
- Avoid two active sweeps in the cavity

SOA ON – ASE emission

19:23 10

marie.klufts (Guest)

20:53 Request control Pop out People Chat Reactions Rooms Apps More Camera Mic Share Leave

UNIVERSITÄT ZU LÜBECK Institute of Biomedical Optics, University of Lübeck

### Acknowledgment

**Lübeck group**

Robert Huber  
Sebastian Karpf  
Wolfgang Drexinger  
Madita Göb  
Philipp Lamminger  
Simon Lotz  
Muhammad Asim Bashir  
Sazgar Burhan

**Optores**

Wolfgang Wieser  
Tom Pfeiffer  
Alexander Mlynsek

**Superlum Diodes Ltd.**

Vladimir Shidlovski  
Alexander Chomarovskiy

**University of Kent**

**Deutsche Forschungsgemeinschaft DFG**

**NetLaS**

**OptoRes**

**SUPERLUM**

**European Commission**

**Marie Curie**

**erc**

**Bundesministerium für Bildung und Forschung**

marie.klufts (Guest)

A few slides from the [NETLAS PhD Student Marie Klufts's](#) rehearsal presentation



## AOG rehearsal presentations for [Photonics West in San Francisco](#) (28 January - 2 February 2023)

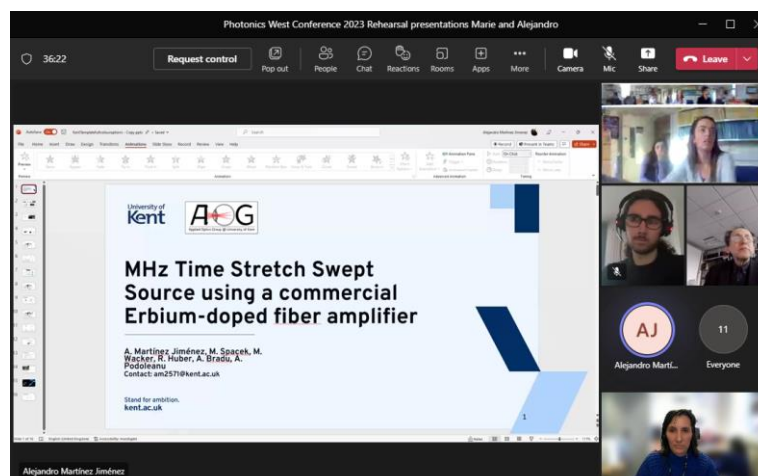
### [NETLAS PhD Student Alejandro Martinez Jimenez](#)

19<sup>th</sup> January 2023 at 1 pm

[NETLAS PhD Student Alejandro Martinez Jimenez](#) also rehearsed his talk entitled “***MHz time stretch swept source using a commercial erbium-doped fiber amplifier***” which was going to be presented at the Photonics West in San Francisco on 30<sup>th</sup> January 2023. Alejandro’s abstract, the date and the presentation time can be found in the conference program under [paper number 12367-10](#). A few slides from Alejandro’s rehearsal will follow.

Alejandro is a co-author for the [paper number 12367-8](#) entitled “***Novel 1.6 MHz swept source for real-time volumetric in-vivo OCT imaging of the human retina***” which was going to be presented at the conference in the same day by his colleague [Netlas PhD Student Esteban Andres Proano Grijalva](#) from Technical University of Denmark (DTU).

Alejandro is also co-author of another [paper number 12367-106](#) entitled “***Characterization of SiN/SiO<sub>2</sub> based MEMS-VCSEL at 1550 nm for optical coherence tomography***” which is going to be presented as a poster at the conference in the same day by his colleague [Netlas PhD Student Irene Rodriguez Lamoso](#) from Technical University of Darmstadt (TUDa).







Photonics West Conference 2023 Rehearsal presentations Marie and Alejandro

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### Time Stretch Swept-Source

University of Kent

- Allow MHz and multi-MHz sweeping rates.

What is needed?

- A **broadband pulse**; which then launched into a **dispersive element**.

BROADBAND PULSE SOURCE

DISPERSIVE ELEMENT

4

Alejandro Martínez Jiménez

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Photonics West Conference 2023 Rehearsal presentations Marie and Alejandro

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### Setup

University of Kent

MODE-LOCKED LASER

EDFA

PC

ISO

CIRC

DL

STRETCHING ELEMENT

INTERFEROMETER

11

Alejandro Martínez Jiménez

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Photonics West Conference 2023 Rehearsal presentations Marie and Alejandro

48:52 Request control Pop out People Chat Reactions Rooms Apps More Camera Mic Share Leave

### THANK FOR YOUR ATTENTION!

University of Kent

Prof Adrian Podoleanu	Dr Adrian Bradu
Dr Manuel Jorge Marques	Dr George Dobre
Dr Ramona Cernat	Dr Michael Hughes
Hal Darrington	Lucy Abbott
Adrian Fernandez	Gianni Nteroli
Julien Camard	Rene Riha
Gopika Venugopal	Sacha Grelet
Marie Klufits	Philip Tatar-Mathes

We acknowledge the support of the EC Horizon 2020 research Marie Skłodowska-Curie NETLAS ITN grant agreement No 860807

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Alejandro Martínez Jiménez

A few slides from the [NETLAS PhD Student Alejandro](#)'s rehearsal presentation



## AOG rehearsal presentations for [Photonics West in San Francisco](#) (28 January - 2 February 2023)

### [NETLAS PhD Student Sascha Grelet](#)

20<sup>th</sup> January 2023 at 1 pm

[NETLAS PhD Student Sascha Grelet](#) rehearsed his talk “*Towards sub-5  $\mu\text{m}$  axial resolution OCT from a multi-MHz swept source*” which was going to be presented at the Photonics West in San Francisco on 30<sup>th</sup> January 2023. Sacha’s abstract, the date and the presentation time can be found in the conference program under [paper number 12390-42](#). A few slides from Sacha’s rehearsal will follow.

20th January 2023 PWest Conf Rehearsal presentation Rene and Sacha

**SPIE. PHOTONICS WEST**

**Toward sub-5  $\mu\text{m}$  axial resolution OCT from a multi-MHz swept source**

Sacha Grelet<sup>1,2,\*</sup>, Patrick Bowen Montague<sup>1</sup>, Adrian Podoleanu<sup>2</sup>

<sup>1</sup> NKT Photonics A/S, Blokken 84, DK-3460, Birkerød, Denmark  
<sup>2</sup> School of Physical Sciences, University of Kent, CT2 7NH, Canterbury, UK  
[sacha.grelet@nktphotonics.com](mailto:sacha.grelet@nktphotonics.com)

Photonics West 2023 – High-Speed Biomedical Imaging and Spectroscopy VIII – BO507

University of Kent NKT Photonics NetLaS

Sacha Grelet (Guest)

20th January 2023 PWest Conf Rehearsal presentation Rene and Sacha

**Swept Source Optimization**

Design of the supercontinuum generation:

- Pulse peak power: **broadening**
- Fiber nonlinear parameter: **broadening**
- ANDi fiber length: **flatness and steepness of the spectrum**

(a) Intensity (a.u.) vs Wavelength (nm) for different peak powers: 80 W, 200 W, 340 W, 550 W. The graph shows the spectrum after the ANDi fibre for different input average power, same pulse duration.

(b) Intensity (a.u.) vs Wavelength (nm) for different peak powers: 80 W, 200 W, 340 W, 550 W. The graph shows the spectrum after the ANDi fibre for different input average power, same pulse duration.

(c) Intensity (a.u.) vs Wavelength (nm) for different peak powers: 80 W, 200 W, 340 W, 550 W. The graph shows the spectrum after the ANDi fibre for different input average power, same pulse duration.

Supercontinuum generation simulation + experiment

Photonics West – BO507 – 30/01/2023

SPIE. PHOTONICS WEST

Sacha Grelet (Guest)



20th January 2023 PWest Conf Rehearsal presentation Rene and Sacha

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### OCT

Swept source  
 Balanced Photodetector  
 Oscilloscope  
 Computer  
 Variable optical delay line  
 Silver Mirror (Example)

Axial resolution	12 $\mu\text{m}$
Axial Range	4 mm
A-scan speed	10 MHz
Sensitivity	-41 dB

NKT Photonics  
 Sacha Grelet - Photonics West - BO2507 - 30.01.2023  
 SPIE PHOTONICS WEST 9

Sacha Grelet (Guest)

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20th January 2023 PWest Conf Rehearsal presentation Rene and Sacha

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### Conclusion

- OCT is a tool that allows faster and faster imaging while keeping good axial resolution
- The **development of new swept sources** is critical to continue improving the technology
- Combining two new technologies**, we present a promising solution that can overcome current limitations

ANDi Supercontinuum

+

Time Stretch

→

High-Speed Broadband Swept-Source

NKT Photonics  
 Sacha Grelet - Photonics West - BO2507 - 30.01.2023  
 SPIE PHOTONICS WEST 10

Sacha Grelet (Guest)

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20th January 2023 PWest Conf Rehearsal presentation Rene and Sacha

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### Acknowledgement

Gopika Venugopal  
Julien Camard  
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Giannis Nteroli

Adrian F. Uceda  
Alejandro M. Jimenez  
Ramona Cernat  
Hal Dorrington

Patrick Bowen Montague  
Ole Bang  
Rasmus D. Engelholm  
Poul Varming

Erik N. Christensen  
Dung Han Yeh  
Andrea Pertoldi  
Anamika K. Nair

NKT Photonics  
 sode2@kent.ac.uk  
 sacha.grelet@nktphotonics.com  
 This project has received funding from the EC Horizon 2020 research and innovation programme Marie Skłodowska-Curie NETLAS ITN grant agreement No 860807.  
 NetLaS  
 SPIE PHOTONICS WEST 11

Sacha Grelet (Guest)

Slides from the [NETLAS PhD Student Sascha's](#) rehearsal presentation





## AOG rehearsal presentations for [Photonics West in San Francisco](#) (28 January - 2 February 2023)

### [NETLAS PhD Student René Riha](#)

20<sup>th</sup> January 2023 at 1 pm

[NETLAS PhD Student René Riha](#) also rehearsed his talk “*A dual resonance sweeping regime in dispersion tuned akinetic swept source at 1550 nm*” which was going to be presented at the Photonics West in San Francisco on 30<sup>th</sup> January 2023. René’s abstract, the date and the presentation time can be found in the conference program under [paper number 12367-12](#). A few slides from René’s rehearsal will follow.

20th January 2023 PWest Conf Rehearsal presentation Rene and Sacha

View 08:02

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Dual resonance sweeping regime - a fully akinetic  
FDML-like swept source for SS-OCT

Rene Riha<sup>a</sup>, prof. Adrian Gh. Podoleanu<sup>b</sup>  
<sup>a</sup>rr406@kent.ac.uk, <sup>b</sup>undefined@jag.h.podoleanu@kent.ac.uk

University of Kent AOG Applied Optics Group @ University of Kent NetLaS

Rene Riha

20th January 2023 PWest Conf Rehearsal presentation Rene and Sacha

View 08:19

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Swept source OCT

- linewidth  $\delta\lambda$  ( $\sim 0.1$  nm), tuning range  $\Delta\lambda$  ( $\sim 100$  nm), sweep frequency  $f_s$  ( $\sim 100$  kHz - 1 MHz)
- mechanical based: FDML, polygon mirror scanner, ...
- akinetic based: time stretching, **dispersion tuned akinetic SS (AKSS)**, ...

- axial resolution

$$\delta z \sim \frac{\lambda^2}{\Delta\lambda}$$

- axial range

$$\Delta z \sim \frac{\lambda^2}{\delta\lambda}$$

Diagram illustrating the swept source OCT setup. A SWEEP SOURCE emits light through a BEAM SPLITTER. One path goes to a REFERENCE MIRROR, and the other path goes to a SAMPLE. Both paths recombine at the BEAM SPLITTER and are detected by a PHOTO DETECTOR. The output is an OCT image.

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Rene Riha



20th January 2023 PWest Conf Rehearsal presentation Rene and Sacha

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### Dual resonance regime

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Rene Riha

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20th January 2023 PWest Conf Rehearsal presentation Rene and Sacha

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### FDML vs. dual resonance regime

parameter	FDML	dual resonance
wavelength filter	tunable FP filter	intensity modulator
cavity length $L$	$\sim 100 - 1000 \text{ m}$	$\sim 100 - 1000 \text{ m}$
cavity dispersion TDD	$\sim 0 \text{ ps/nm}$	$\sim 1 \text{ ps/nm (?)}$
sweep frequency $f_s$	$\sim 100 - 1000 \text{ kHz}$	$\sim 100 - 1000 \text{ kHz}$
sweep function	sinusoidal	adjustable
optical field	long pulses $\tau_p \sim 1/f_s$	short pulses $\tau_p \sim 1/f_m$

Dual resonance dispersion tuned AKSS

FDML<sup>3</sup>

<sup>3</sup>Kranendonk, L. A. et al. *Opt. Express*, 2007, 15.

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Rene Riha

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20th January 2023 PWest Conf Rehearsal presentation Rene and Sacha

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### Conclusion and further research

- dual resonance regime's feasibility proven at 1550 nm
- research and first image (ever) in the dual resonance at 1060 nm
- dual resonance at 850 nm

Thank you for the attention

EC Horizon 2020 research Marie Skłodowska-Curie NETLAS ITN grant agreement No 860807

Rene Riha

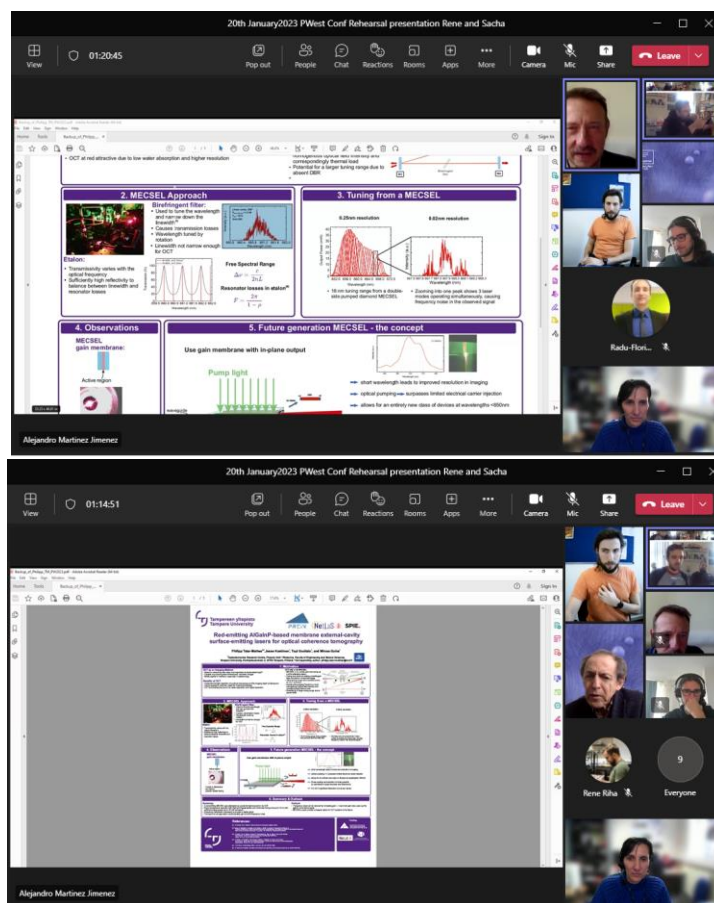
A few slides from the [NETLAS PhD Student Rene's](#) rehearsal presentation



## AOG rehearsal presentations for [Photonics West in San Francisco](#) (28 January - 2 February 2023)

20<sup>th</sup> January 2023 at 1 pm

[NETLAS PhD Student Philipp Tatar-Mathes](#) will be presenting a poster entitled “*Investigation of a red-emitting MECSEL for OCT applications*” at the Photonics West conference in San Francisco on 31<sup>st</sup> January 2023. Philipp’s abstract, the date and the presentation time can be found in the conference program under [paper number 12404-3](#). Two slides from Philipp’s rehearsal presentation will follow.



Slides from [NETLAS PhD Student Philipp's](#) rehearsal poster presentation



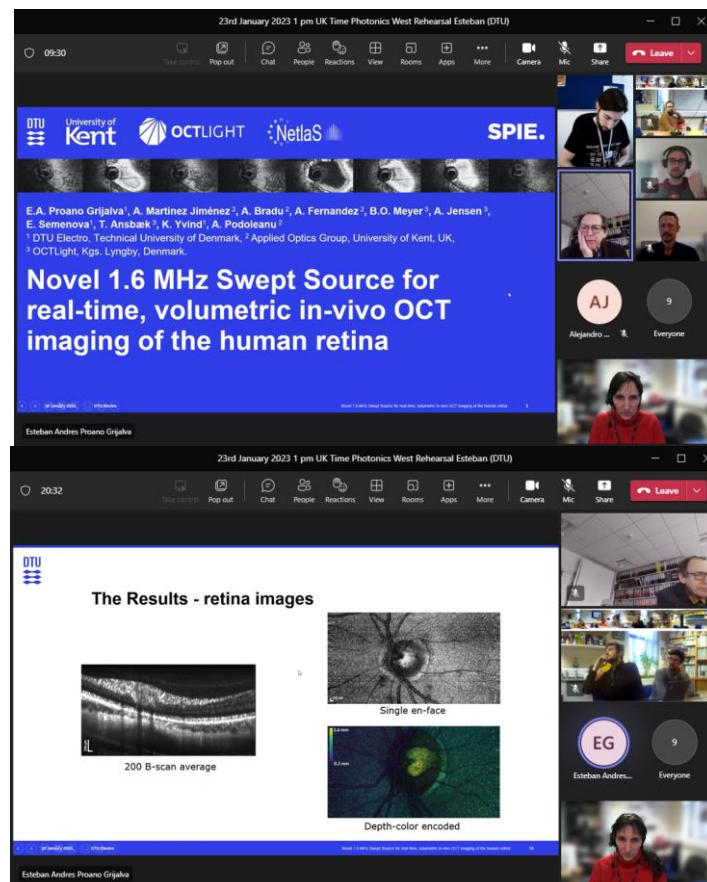


## AOG rehearsal presentations for [Photonics West in San Francisco](#) (28 January - 2 February 2023)

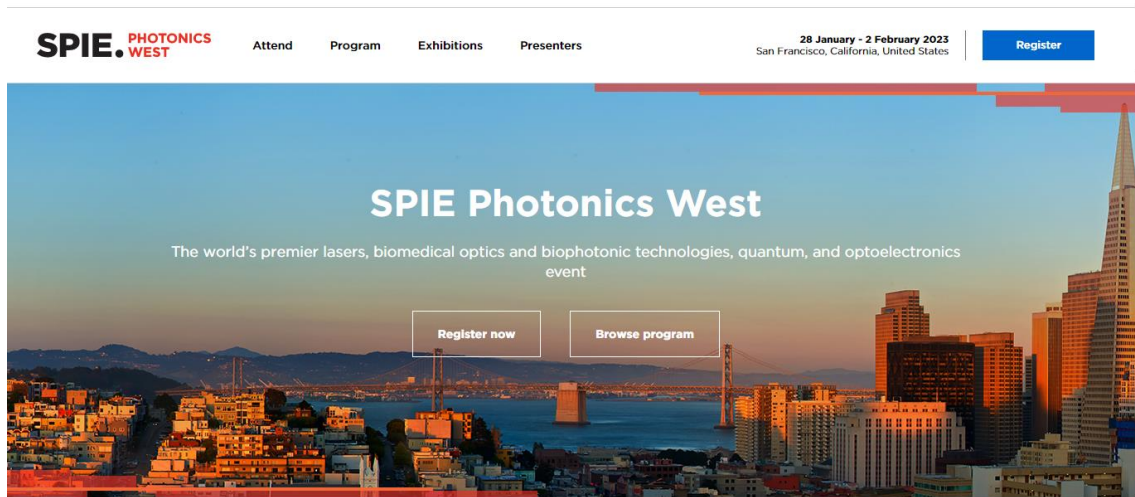
### [NETLAS PhD Student Esteban Proano Grijalva](#)

23rd January 2023 at 1 pm

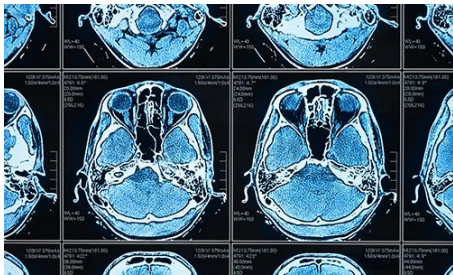
[NETLAS PhD Student Esteban Andres Proano Grijalva](#) also rehearsed his talk entitled “*Novel 1.6 MHz swept source for real-time volumetric in-vivo OCT imaging of the human retina*” which was going to be presented at the Photonics West in San Francisco on 30<sup>th</sup> January 2023. Esteban’s abstract, the date and the presentation time can be found in the conference program under [paper number 12367-8](#). A few slides from Esteban’s rehearsal will follow.



Slides from the [NETLAS PhD Student Esteban’s](#) rehearsal presentation



**Technical conferences with thousands of papers and presentations**



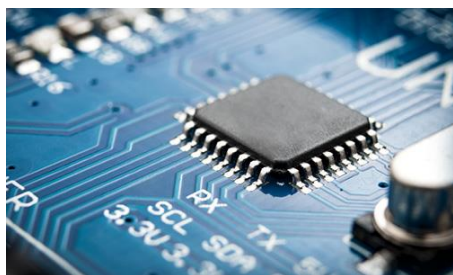
### [BIOS](#)

**Biophotonics, biomedical optics, and imaging conference**



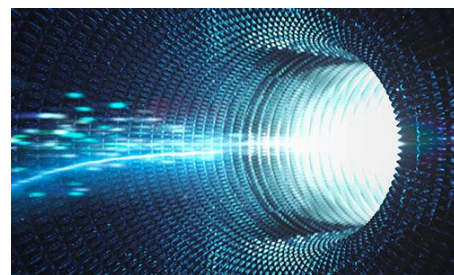
### [LASE](#)

**Industrial laser, laser source, and laser application conference**



### [OPTO](#)

**all facets of optoelectronics, photonic materials, and devices**



### [Quantum West](#)

**the future of applied quantum technologies**

**[Browse the 2023 Photonics West program](#)**



## Industry sessions



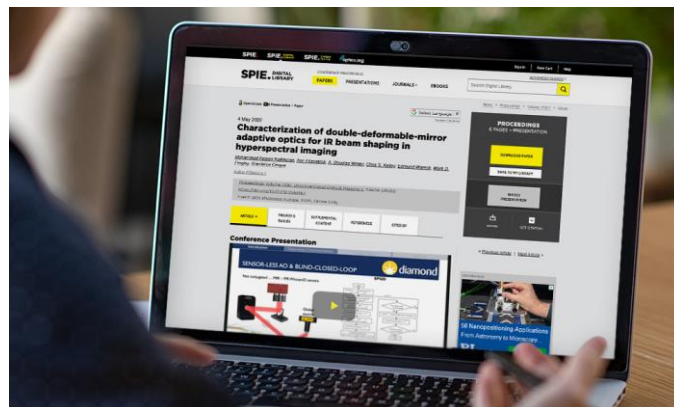
## Courses



## Plenary events



## Special events



Access the research you need: **Presentations and manuscripts presented at Photonics West are published in the Proceedings of SPIE on the [SPIE Digital Library](#).**





Good luck & Safe Journey to all  
our NETLAS PhD Students and  
their colleagues travelling to San  
Francisco to attend the  
Photonics West 2023  
conference!





## Prof. Maciej Wojtkowski

Chair at [ICTER](#) (International Centre for Translational Eye Research)

[Institute of Physical Chemistry, Polish Academy of Sciences](#)

[Nicolaus Copernicus University, Poland](#)



**[Prof. Maciej Wojtkowski](#)** is a renowned scientist active in the field of biomedical imaging. His research interests include optical coherence imaging and microscopy applied to biomedical imaging. He has a **pioneering contribution to design and development of ultra-high speed Optical Coherence Tomography (OCT)**, which is commonly used in ophthalmic and cardiologic diagnosis. **Multiple OCT prototypes developed by Prof. Wojtkowski served as the basis for many instruments in ophthalmology clinics across the World.**

Prof. Maciej Wojtkowski authored more than 200 publications, including 1 book and 130 full papers in peer reviewed journals ([Google Scholar](#) and [Research Gate](#)). During his academic career Prof. Maciej Wojtkowski gained international experience, while working at the Massachusetts Institute of Technology, Cambridge, MA (USA) and New England Eye Center, Boston, MA (USA). He was also on research internships in Vienna University and **University of Kent**.

Currently, he is the Head of the Department of Physical Chemistry of Biological Systems at the **Institute of Physical Chemistry of Polish Academy of Sciences**. He **won the international competition** for the ERA Chair holder in the [CREATE project \(EU HORIZON 2020\)](#). Check his group website [here](#).

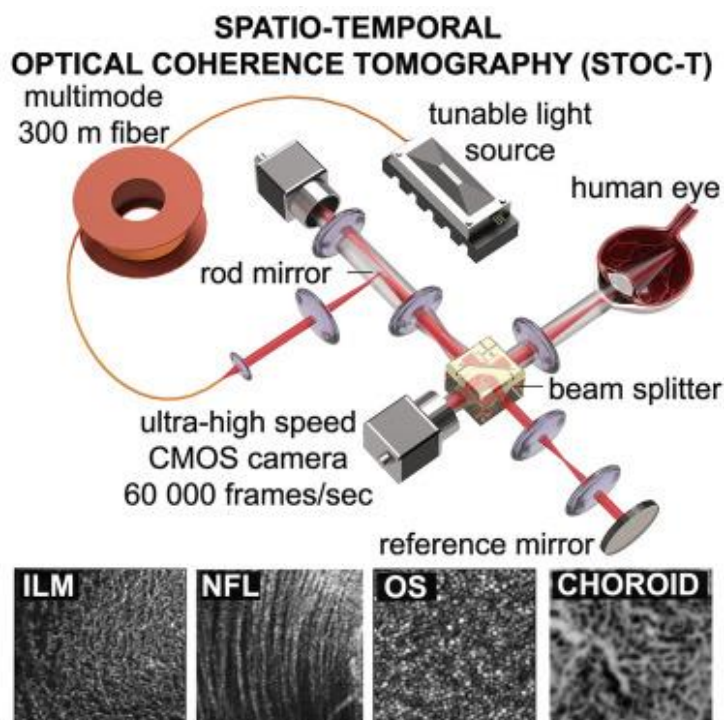
## PUBLICATIONS

**Retina and choroid without secrets. STOC tomography enables unprecedented views of eye structure – **new paper in iScience** by Prof. M. Wojtkowski et al.**

**Spatio-temporal optical coherence tomography provides full thickness imaging of the chorioretinal complex**

iScience, Volume 25, Issue 12, 2022,

<https://doi.org/10.1016/j.isci.2022.105513>



### Highlights

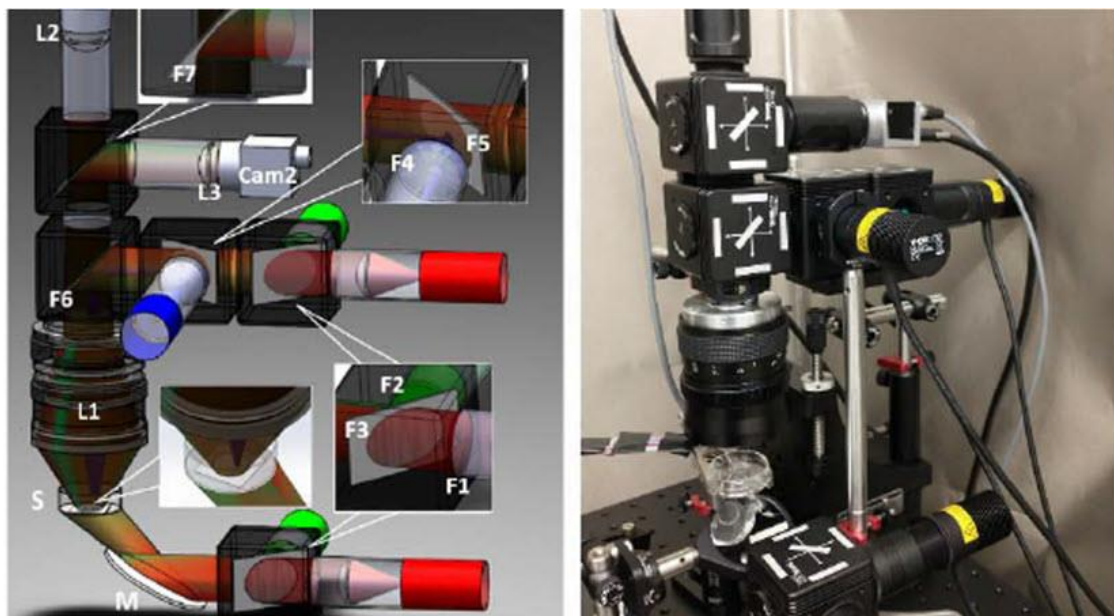
- STOC-T enables uniform 5  $\mu\text{m}$  resolution imaging of the chorioretinal complex
- Full-field detection and digital defocus correction ensure >1 mm axial imaging range
- High contrast coronal projections of choroid are obtained for selected depths
- Quantitative morphometry metrics are derived from choriocapillaris image

**[Read the article](#)**



## Portable and affordable all-optical system for testing lab-on-a-chip human hearts

A novel system utilizes optogenetics, machine vision cameras, and off-the-shelf components to stimulate and image engineered networks of human heart cells



Researchers developed a portable and low-cost macroscopic mapping system for all-optical cardiac electrophysiology with applications in drug development and personalized treatments. (a) Schematic of the imaging system. (b) The actual setup. Image credit: Heinson, Han, and Entcheva

Read the Gold Open Access article, by Y. W. Heinson, J. L. Han, and E. Entcheva, “[Portable low-cost macroscopic mapping system for all-optical cardiac electrophysiology](#),” *J. Biomed. Opt.* **28**(1), 016001 (2023), doi [10.1117/1.JBO.28.1.016001](#).

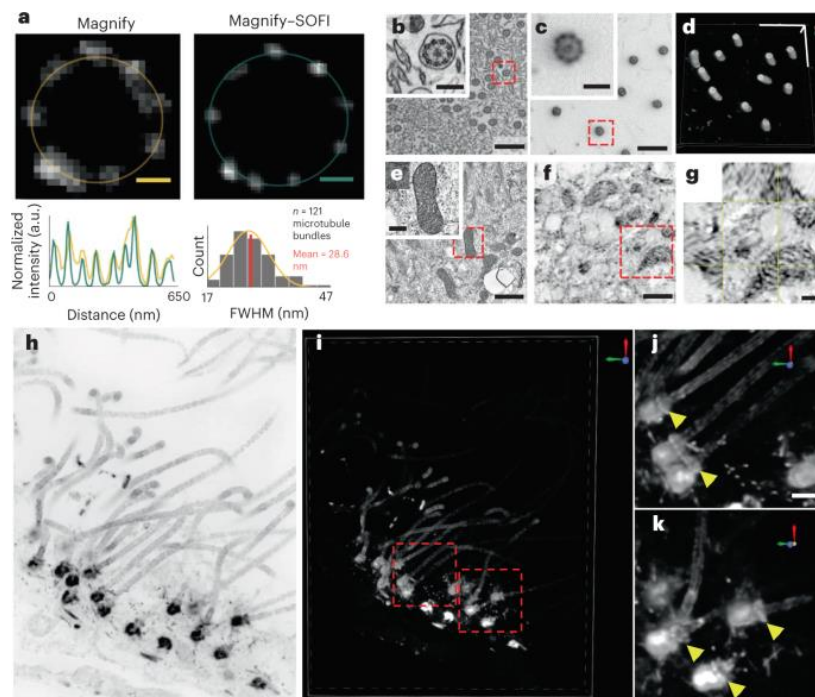


## Magnify is a universal molecular anchoring strategy for expansion microscopy

Aleksandra Klimas et. all.

*Nature Biotechnology* ( Published on 02 January 2023)

Expansion microscopy enables nanoimaging with conventional microscopes by physically and isotropically magnifying preserved biological specimens embedded in a crosslinked water-swelling hydrogel. Current expansion microscopy protocols require prior treatment with reactive anchoring chemicals to link specific labels and biomolecule classes to the gel. We describe a strategy called Magnify, which uses a mechanically sturdy gel that retains nucleic acids, proteins and lipids without the need for a separate anchoring step. Magnify expands biological specimens up to 11 times and facilitates imaging of cells and tissues with effectively around 25-nm resolution using a diffraction-limited objective lens of about 280 nm on conventional optical microscopes or with around 15 nm effective resolution if combined with super-resolution optical fluctuation imaging. We demonstrate Magnify on a broad range of biological specimens, providing insight into nanoscopic subcellular structures, including synaptic proteins from mouse brain, podocyte foot processes in formalin-fixed paraffin-embedded human kidney and defects in cilia and basal bodies in drug-treated human lung organoids.



**Fig.5 a**, Comparison between Magnify and Magnify-SOFI. Top, Cross-section of a basal body in human bronchial basal stem-cell-derived lung organoid processed with Magnify (left) and Magnify-SOFI (right). [Read More](#)



## Biomedical Optics Express

welcomes submissions to a feature issue: "30 Years of Optical Coherence Tomography"

### **30 Years of Optical Coherence Tomography**

Submission Opens: **28 November 2022**

Submission Deadline: **28 February 2023**

*Biomedical Optics Express* welcomes submissions to a feature issue, "30 Years of Optical Coherence Tomography." Since its first appearance more than 30 years ago, Optical Coherence Tomography (OCT) has undergone multiple generations of rapid technology development and has become a standard-of-care diagnostic technology in several medical specialties. Many of these developments were first described in *Optica* (formerly *OSA*) journals and meetings.

Submissions of contributed original papers describing novel technology development and applications are particularly encouraged. The issue will also include invited review papers summarizing progress in particular sub-fields of technology and applications of OCT and invited research papers on hot topics in current OCT research. Topics of interest include, but are not limited to, the following:

- New light sources and other OCT system component technologies
- New OCT system designs and implementations
- New contrasting schemes including exogenous, endogenous, as well as pure software-based methods
- Progress in OCT image processing, visualization and interpretation
- Artificial Intelligence applied to OCT
- Data management of high speed 3-and 4-dimensional OCT applications
- Functional imaging extensions of OCT, including OCT angiography, OCT elastography, or dynamic OCT
- Pre-clinical studies and applications of OCT in biological applications and animal models or organoids
- Technologies enabling clinical translation of OCT in ophthalmology, cardiology, and other medical disciplines
- Multimodal combination of OCT and complementary imaging and sensing methods
- Existing or proposed standards for conducting and reporting OCT-related research
- Analysis and meta-analyses of the research, clinical, and economic impact of OCT technology

All submissions need to present original, previously unpublished work and will be subject to the normal standards and peer review processes of the journal. The standard *Biomedical Optics Express* [Article Processing Charges](#) will apply to all published articles.



Please prepare manuscripts according to the [author instructions](#) for submission to *Biomedical Optics Express* and submit through the [Prism electronic submission system](#), specifying from the drop-down menu that the manuscript is for the feature issue on 30 Years of OCT.

### Feature Editors

**Rainer A. Leitgeb**, *Medical University of Vienna, Austria* (Lead Editor)

**Brett Bouma**, *Wellman Center of Medicine, Harvard Medical School, USA*

**Kate Grieve**, *Quinze Vingts Hospital and Vision Institute, France*

**Christine Hendon**, *Columbia University, USA*

**Adrian Podoleanu**, *University of Kent at Canterbury, UK*

**Maciej Wojtkowski**, *Polish Academy of Sciences, Poland*

**Yoshiaki Yasuno**, *University of Tsukuba, Japan*

**OPTICA PUBLISHING GROUP** | Formerly OSA

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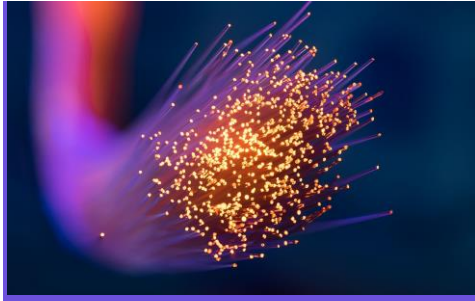
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**Biomedical Optics EXPRESS**

**Biomedical Optics Express**  
Ruikang (Ricky) Wang, Editor-in-Chief  
Editorial Board >

FEATURE ISSUE OF *BIOMEDICAL OPTICS EXPRESS*

**30 Years of Optical Coherence Tomography**  
Submission Opens: 28 November 2022  
Submission Deadline: 28 February 2023



## **Novel Light Sources and Luminescent Materials for Biophotonic Applications**

Frontiers in Photonics welcome the submission of Reviews, Mini-Reviews, Perspectives, and Original Research. **Topics of interest include**, but are not limited to, **the following fields**:

- The utilization of **novel lasers**, LEDs, and other **light sources for biomedical applications**;
- **Light sources and luminescent materials** seeking to enhance the performance, efficiency, and the wavelength ranges for specific **bio-sensing and imaging applications**;
- **Biocompatible and degradable optical emitters**;
- Research pertaining to underlying material research and photophysical mechanisms in life science applications;
- Luminescent Biosensors.

### **Author Guidelines**

**Manuscript Submission Deadline extended to 10 March 2023**





## Another special feature of interest to NETLAS community

A special issue of [Applied Sciences](#) (ISSN 2076-3417)

### **"Ultrasonic and Photonic Technologies for Biomedical Imaging and Elastography"**

(This special issue belongs to the section "[Biomedical Engineering](#)")

Topics of particular interest include, but are not limited to, the following topics:

- **bio-optical imaging**
- ultrasound imaging
- elastography
- multimodal imaging
- machine learning and image processing
- microscopy
- tissue optics and spectroscopy
- focused ultrasound
- photoacoustic imaging and spectroscopy
- clinical ultrasound

Dr. Chunhui Li

Dr. James Joseph

Prof. Dr. Zhihong Huang

***Guest Editors***

[Manuscript Submission Information](#)

**Deadline for manuscript submissions: 20 April 2023**



## Student Theses -Optical Coherence Tomography News

### Development and Application of Polarization Sensitive Optical Coherence Tomography



**By Peijun Tang**

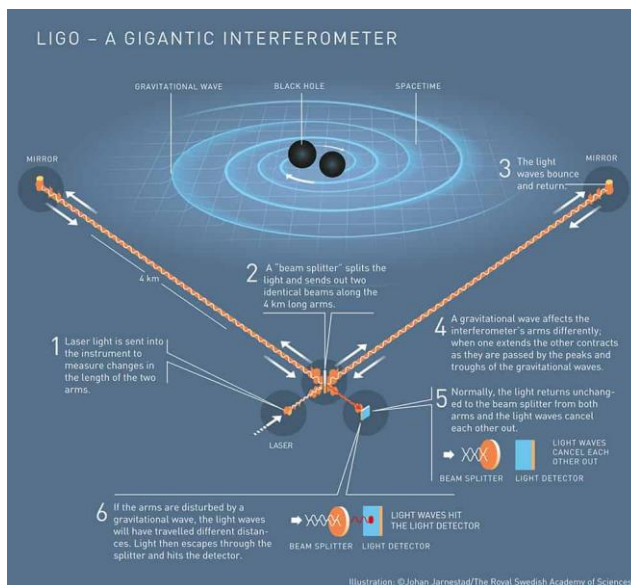
**University of Washington**

Optical coherence tomography (OCT), a three-dimensional optical imaging technique based on low coherence interferometry, can be extended to measure the functional property of the biological sample. As a functional extension of OCT, polarization sensitive optical coherence tomography (PSOCT) enables 3D imaging of the anisotropic biological samples, such as scar, tendon, muscle, collagen, and nerve fiber bundles. **This thesis focuses on the development and application of PSOCT.** This goal includes four specific aims. **The first aim** is to develop a single input PSOCT imaging system with an improved image contrast. To achieve this aim, the polarization state is utilized as the imaging parameter and visualized using the Stokes parameters-based color-encoded algorithm. **The second aim** is to develop an algorithm that can derive depth-resolved polarization parameters with the single input PSOCT system. Towards this aim, a PSOCT-based polarization state transmission model is proposed. Based on this model, a novel method that utilizes discrete differential geometry (DDG) combined with a series of 3D rotations is developed to derive the local axis orientation and phase retardation. **The third aim** is to use the developed DDG-based PST method to extract the collagen organization embedded within the soft biological tissues. To achieve this aim, the proposed method is utilized to image the local axis orientation of the collagen fibers of the rodent heart and human facial skin. **The fourth aim** is to use the multiparameter provided by the PSOCT to detect and characterize the white spot lesions in the enamel of the tooth. Towards this aim, multiple parameters in the PSOCT: scattering, attenuation, degree of polarization (DOP), local axis orientation and local phase retardation of the sample are provided simultaneously for the comprehensive investigation of the location, depth, and severity of the white spot lesions. [Read More](#)



## What is an interferometer?

In the mid-1880s, [Albert Michelson](#) developed a device called an [interferometer](#), which could measure lengths as well as velocities of light with great precision. His invention earned him the [1907 Nobel Prize in Physics](#). Over a century later, the [LIGO Scientific Collaboration](#) used an interferometer to detect gravitational waves, **leading to the 2017 physics prize** for [Rainer Weiss, Kip Thorne and Barry Barish](#).



LIGO: a gigantic interferometer

[LIGO's device](#) shares many similarities with Michelson's original device, invented in the 1880s. However it is a far more sophisticated instrument - the size and complexity of LIGO's interferometers are far beyond anything Michelson could have envisioned or that his original interferometer could have achieved

@ [https://lnkd.in/d6BH\\_agX](https://lnkd.in/d6BH_agX)

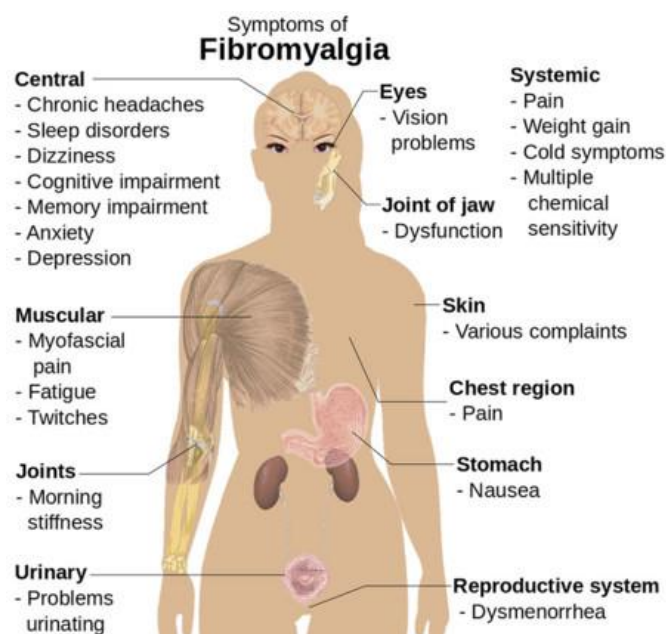
@ <https://physicsworld.com/>

# Fibromyalgia Signs Visible in Retina

## Spectral-domain OCT parameters enabled the identification of affected eyes

@ [News from Heidelberg Engineering](#)

A study of 50 patients with fibromyalgia and 232 healthy controls reported that the **SPECTRALIS spectral-domain OCT was able to differentiate between controls and fibromyalgia patients**. OCT imaging revealed significantly decreased peripapillary RNFL (retinal nerve fiber layer) in the superonasal, nasal, inferonasal, temporal and inferotemporal sectors in fibromyalgia patients.



**Spectralis OCT was able to effectively differentiate between healthy patients and those with FM**

@Mikael Häggström, Public domain, via Wikimedia Commons

Read More on [Fibromyalgia Signs Visible in Retina \(reviewofoptometry.com\)](http://reviewofoptometry.com)





# BIONABU

Connecting the dots in a global marketplace  
for medical technology.

A public Medtech platform building the expert advice & education from professionals on healthcare and business-related topics. We connect healthcare professionals, businesses, and organizations to medical technology. Our goal is to make access affordable and barrier-free worldwide.

Join us today, it's free: <https://www.bionabu.com/>



## Meet Esh Tatla!

- Founder and Host of the MedTech Podcast
- Head of Innovation at Bionabu
- Medical Student at University of Nottingham



The MedTech Podcast with Esh Tatla is a must-listen for anyone interested in staying up-to-date on the latest developments in the medical field.

Join the conversation with industry experts, entrepreneurs, and thought leaders about the future of healthcare.

We discuss and share stories about MedTech innovation arising from BIONABU's community of clinicians, entrepreneurs and techies!

Stay informed, inspired, and engaged with the latest trends and innovations in healthcare.



## EPISODES OUT NOW

### **#3 The Modern Medical Mindset: Embracing Diversification in Your Career** with Dr Joel Brown

**Dr. Joel Brown**, a portfolio GP, discusses how to modernise and diversify your career as a clinician. Learn about the benefits of diversifying your skillset and exploring new opportunities to enhance your professional growth. Dr. Brown shares practical tips and valuable insights on navigating the medical industry, while still maintaining your passion for patient care. This is an episode not to be missed for anyone looking to stay relevant and advance in the medical field

Join Esh and Dr. Brown for a thought-provoking discussion on the future of medicine and the role of the modern clinician

### **#2 The Art of Personal Branding: Navigating the Digital Age in Healthcare** with Mark Walmsley

Esh welcomes Mark Walmsley, a marketing and branding expert with a wealth of experience in the music and web design industry, to discuss the ever-evolving landscape of personal branding in the digital age. Mark delves into the rise of the portfolio career, the importance of building a strong personal brand, and the impact of technology on branding and marketing strategies. He shares valuable insights on how to effectively communicate one's unique value proposition, emphasizing the importance of being clear, concise, and engaging. Mark also highlights his award-winning brand discovery workshop, designed to help individuals and businesses tap into their unique strengths and differentiate themselves in a crowded market.

Join Esh and Mark for this engaging and informative episode as they explore the importance of personal branding in healthcare

### **#1 Artificial Intelligence in Healthcare, ChatGPT and the Machine Learning Workflow** with Dr Avneesh Khare

Dr Avneesh Khare, an expert in artificial intelligence (AI) in healthcare, joins Esh to discuss the different types of AI, common misconceptions surrounding it, and the potential benefits and drawbacks of using chatbots like ChatGPT in healthcare and education settings. They also delve into the machine learning workflow and the importance of clinicians being aware of AI and its applications in order to stay current and make informed decisions about its use in clinical practice. Dr Khare also addresses the ethical considerations of AI in healthcare. Don't miss this exciting, yet informative episode on the intersection of AI and healthcare.



**LISTEN NOW ON ALL MAJOR PLATFORMS [CLICK HERE](#)**



## Physics course at the University of Kent, UK

**Come and visit!**

Kent is a dynamic, creative and inclusive university, where your ambitions for the future meet ours!

Open Days: hear from staff and students about the courses University of Kent offer at Canterbury and Medway, find out about accommodation and experience our stunning campuses from wherever you are in the world.

**Whatever your interests, whatever your goals, we can help you make your ambition count.**

Open to **Potential undergraduates** (and their families and supporters) and **Potential postgraduate students (Master's and PhD)** and their supporters.

**Who to contact:** Recruitment and Events Team,  
**[opendays@kent.ac.uk](mailto:opendays@kent.ac.uk)**

[Dr Michael Hughes](#) and [AOG PhD student Lucy Abbot](#) talk about the Physics course at the University of Kent, UK:

Watch their YouTube video:

[Dr Michael Hughes and Lucy Abbott, Physics BSc - YouTube](#)



# OPTICS & PHOTONICS NEWS



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

- [Photonic Computing for Sale](#)
- [Advancing Nanolasers](#)
- [Two Breakthroughs That Revolutionized Optics](#)

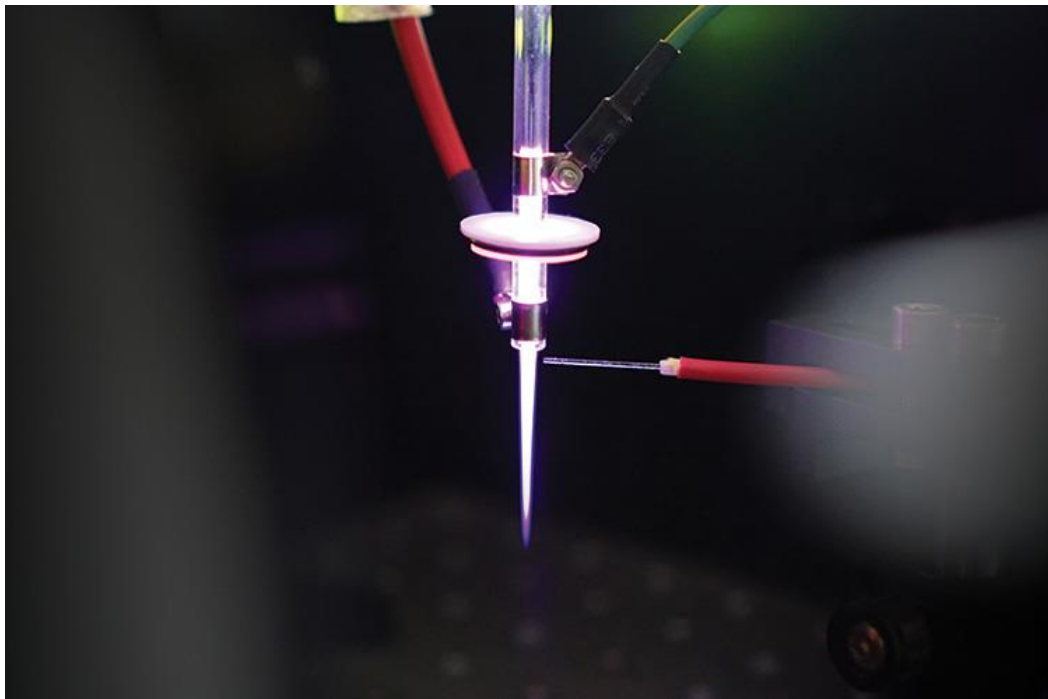
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[Browse all Issues](#)



## Image of the Week

Striking images of optics and photonics, contributed by Optics & Photonics News (OPN) readers



## **Cold Plasma**

A cold atmospheric-pressure plasma jet in a helium/deuterated-water (HDO) mixture in the lab of Grant Ritchie, University of Oxford, UK. The plasma is pulsed at 20 kHz and is probed by the laser beam of a fast mid-infrared dual-comb spectrometer (IRsweep, IRis-F1) to study changes in the energy state population density of HDO. [OPN 2022 Photo Contest Honorable Mention]

—*Michele Gianella, Empa, Dübendorf, Switzerland*



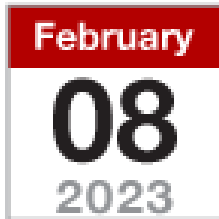
## Webinars

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!](#)

## Galvanometers 101: Selection Process

oin Thorlabs' product line expert, Carol Borsa, as she highlights galvanometer systems and how to choose the best configuration for your application. Carol will provide a breakdown of the system's main parts, an explanation of the different levels of integration that are available, and a review of the considerations that should be taken into account during product selection.



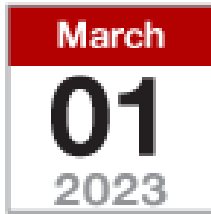
### Presented by Carol Borsa, Inside Account Manager, Thorlabs

Carol Borsa has been with Thorlabs since a merge that occurred in 2020 and is currently working as the subject matter expert for the galvanometer product line. Within this role, Carol works to help customers choose catalog galvanometers that work for their application. She additionally works with customizations and alternative configurations for projects that have specific requirements within both R&D and OEM.

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



Thorlabs Offers a Variety of [1-Axis](#), [2-Axis](#), and [3-Axis](#) Galvanometers



[Coming Soon!](#)

## **Silicon Photonic Integrated Circuits**

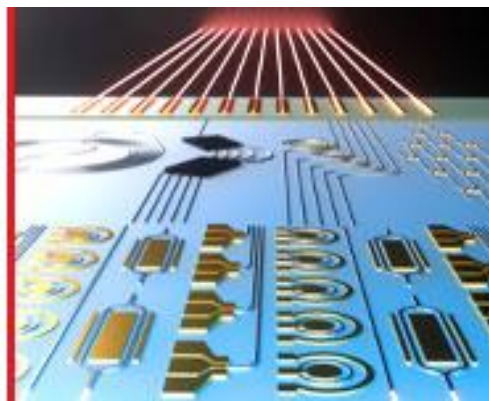
A variety of communication and sensing applications require higher levels of photonic integration and enhanced levels of photonic performance. Recently, materials advances have enabled significant gains in the performance of lasers, modulators, photodetectors, and photonic integrated circuits on silicon. 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**





# OSA Chapter webinar 1 of Woman in Optics 2023

**Women in Optics** is a webinar series that **promotes women empowerment** for those **pursuing academic careers and working in optics and photonics**.

The main goal is to Establish a precedent to encourage more women to pursue careers in the field, boosting diversity and gender inclusion in the STEM fields (science, technology, engineering, and mathematics). Through the contributions of great professionals in the area, **Women in Optics celebrates the remarkable accomplishments of women in the scientific field.**

**Woman in Optics 2023 - Webinar # 1**  
**Feb 7, 2023 10:30 AM Puerto Rico**

**February Plenary Speakers:**

[Alessandra Carmichael-Martins](#) Time: 10:35 am

[Hyeon Jeong Lee](#) Time: 11:00 am

[Maria Vinas](#) Time: 11:25 am

**Register in advance for Woman in Optics 2023 -- Webinar # 1:**

<https://lnkd.in/eBdCsVpK>

Youtube Link:

<https://lnkd.in/eX-mBY2G>



## **NETLAS Beneficiary NKT Photonics attended Photonics Spectra Conference 2023**

**9-12 January 2023**



"The new developments that **quantum computing** is driving in fiber lasers and frequency conversion."

On **Monday 9 Jan** at  
8:35 AM EST/2:35 PM CET



The virtual event comprised **four technology tracks** featuring webinars presented by experts in **Lasers, Optics, Test and Measurement, and Photonic Integrated Circuits (PICs)**.

Please find the program of the event here:

[Program | Photonics Spectra Conference 2023](#)



## **NETLAS Beneficiary NKT Photonics is attending Photonics West 2023**

**28 January - 2 February 2023**

San Francisco, California, United States

**NKT Photonics are launching a range of new lasers  
at BIOS & Photonics West: The most important  
annual event featuring the best in photonics  
research and technology**

**They can be found at booth #3201**



**Check their new lasers at BIOS &  
Photonics West 2023**

Read More about the conference on [Attend Photonics West 2023 \(spie.org\)](https://www.spie.org/Attend-Photonics-West-2023)



## **NETLAS Beneficiary OCTLight is attending Photonics West 2023**

**28 January - 2 February 2023**

San Francisco, California, United States

Meet us at booth 5519

**SPIE. PHOTONICS WEST**

We will be there from  
January 31st to February 2nd



Come talk about how our Caliper-HERO make possible OCTA imaging with MHz A-scan rate



Their product [Caliper-HERO](#) make possible a 5-10X improvement in OCTA imaging speed. This is of key importance to increase the quality and field-of-view to advance eye care.

The image is a 12x12 mm OCTA (field-of-view defined by OCT imaging system) that shows how blood-vessels around the fovea and retina of the eye can be clearly seen.

Photo & text from [OCTLight Linkedn post](#)





## NEWS from [NETLAS Beneficiary](#) [Technical University Of Denmark](#) (DTU)

### Spinout behind laser chip rides DTU's innovation wave

The number of new companies emerging from DTU tripled between 2008-2019. One of the companies that's taken this journey is [OCTLIGHT](#) which has developed a laser chip for use in eye diagnostics.

The laser chip company **OCTLIGHT is one of 850 companies** that have been created based on DTU projects over the past ten years. During the same period, DTU has built up an extensive ecosystem for entrepreneurship.

#### **LASER CHIP FOR DIAGNOSING EYE DISEASES**

It took eight years for OctLight to develop the laser chip. A chip that is similar to the chip used for facial recognition in mobile phones. The components are so small that they're invisible to the naked eye but integrated into the right electronic circuits, a laser diode can take retina measurements and diagnoses of visual function and eye diseases to a whole new level.

The company's first finished units are being tested at MedTech companies that develop products for ophthalmologists, who make up the primary market for the product.

Even before his studies at DTU, **OctLight's founder and CEO, [Thor Ansbaek](#)**, wanted to develop technology that could be used for something concrete:

***"I was very attracted to DTU's slogan 'making it matter'—designing something that can make a difference in the world. And when I first started specializing in making microsystems on chips in DTU's cleanroom, I was keen to start a high-tech company."***

Fast laser helps doctors image full eye in 3D ([video news story](#))

Read More from [DTU News](#)




**innolume**

**NETLAS Beneficiary Innolume is**  
**attending Photonics West 2023**

**28 January - 2 February 2023**

San Francisco, California, United States



DATA COMPRODUCTSAPPLICATIONCOMPANY

# SPIE. PHOTONICS WEST

28 January - 2 February 2023  
San Francisco, California, United States

Latest  
Company's  
News

**Exhibition Photonics West. Booth 4320**  
Innolume is joining world's largest photonics technologies event.  
Please visit us at our partner Booth 4320 - Alfalume.

Read More about their participation on [Innolume Website](#) and check their products [here](#).



## **NETLAS Beneficiary Superlum is attending Photonics West 2023**

**28 January - 2 February 2023**

San Francisco, California, United States

At this year's [#SPIEBiOS](#), SUPERLUM will be situated in Hall D of the Moscone Center in San Francisco, USA. Superlum booth number is 8441, it is located very close to the entrance of the hall.

You are very welcome to arrange a meeting with [Superlum](#) in advance by sending a message to [sales@superlum.ie](mailto:sales@superlum.ie) or by visiting their websites: [www.superlumdiodes.com](http://www.superlumdiodes.com) and [www.superlum.ie](http://www.superlum.ie)



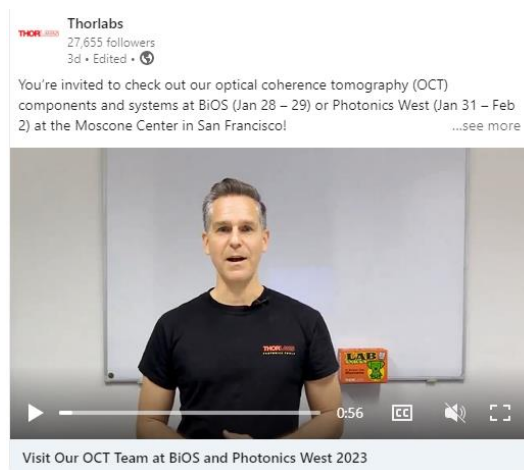
@ [Superlum LinkedIn post](#)



If you are attending Photonics West Conference 2023 you are invited to check Thorlabs's Optical Coherence Tomography (OCT) components and systems at BiOS (Jan 28 – 29) or Photonics West (Jan 31 – Feb 2) at the Moscone Center in San Francisco!

[Thorlabs](#) have **live swept source** and **spectral domain OCT system demos**, and their experts will be on hand to discuss your specific application. Be sure to stop by booth # **8331 at BiOS** and booth # **627 at Photonics West** to see all their new products and get this year's **Thorlabs t-shirt** 😊

Check out their turnkey OCT systems **and bring your own samples for a live demo!** On top of that we will be showing a variety of OCT components, including theirs [MEMS-VCSEL benchtop lasers](#) and brand-new [OCT spectrometers](#).



Former AOG PhD Student  
[Michael Leitner](#) – educated under [HIRESOMI project](#)- a Marie Curie training network co-ordinated by Prof Adrian Podoleanu which ran from 2006 to 2010 –  
now working as **Product and Sales Manager OCT at Thorlabs** - is inviting you to visit their boots at the Moscone Center in San Francisco  
28th Jan - 2nd Febr.

@ [Thorlabs LinkedIn post](#)

[Visit Thorlabs OCT Team at BiOS and Photonics West 2023](#)





## Happy Birthday to Isaac Newton

### English physicist and mathematician

**4 January 1643** [[O.S.](#) 25 December 1642]<sup>[a]</sup> - **31 March 1727** [[O.S.](#) 20 March 1726]<sup>[a]</sup>

During Newton's lifetime, two calendars were in use in Europe: the [Julian](#) ("Old Style") calendar in [Protestant](#) and [Orthodox](#) regions, including Britain; and the [Gregorian](#) ("New Style") calendar in Roman Catholic Europe. At Newton's birth, Gregorian dates were ten days ahead of Julian dates; thus, his birth is recorded as taking place on 25 December 1642 Old Style, but it can be converted to a New Style (modern) date of 4 January 1643. Read Isaac Newton's biography's [here](#).

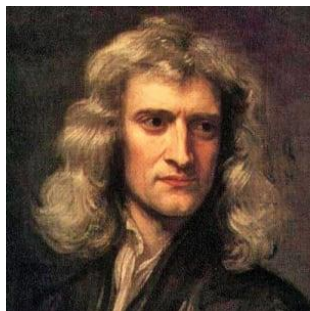


Photo: Painting by Godfrey Kneller, [Public Domain], via Wikimedia Commons

Isaac Newton was a physicist and mathematician who **developed the principles of modern physics**, including the laws of motion and is credited as one of the great minds of the 17th-century [Scientific Revolution](#).

In 1687, he published his most acclaimed work, *Philosophiæ Naturalis Principia Mathematica* (Mathematical Principles of Natural Philosophy), which has been called the single most influential book on physics. In this work he described the [three laws of motion](#) as well as the law of universal [gravity](#). In 1705, he was knighted by Queen Anne of England, making him Sir Isaac Newton.

Isaac Newton made many scientific discoveries and inventions throughout his career. Here is a list of some of the [most important and famous ones](#).

- [Gravity](#) - Newton is probably most famous for discovering gravity. Outlined in the *Principia*, his theory about gravity helped to explain the movements of the planets and the Sun. This theory is known today as Newton's law of universal gravitation.
- [Laws of Motion](#) - Newton's laws of motion were three fundamental laws of physics that laid the foundation for classical mechanics.
- [Calculus](#) - Newton invented a whole new type of mathematics which he called "fluxions." Today we call this math calculus and it is an important type of math used in advanced engineering and science.
- Reflecting Telescope - In 1668 Newton invented the [reflecting telescope](#). This type of telescope uses mirrors to reflect light and form an image. Nearly all of the major telescopes used in astronomy today are reflecting telescopes.
- [Newton's rings](#), Please see the paper [Coherence imaging by use of a Newton rings sampling function](#), A. Podoleanu et.al, © 1996 Optical Society of America



## **A Happy New Year from Comanesti, Moldova/Romania on 30 Dec 2022**

This is my home town! The capital of Bear Dancing during the New Year's Eve! A lot of sound, movement, and color, essential to recharge batteries for a new year. A few images of 'bear teams' going to the council to get their permission to dance for several days straddling the two years.

The pelts have been passed down from generation to generation and can weigh tens of kgs. Despite this fact, many women join the parade as well as small children in mini furs.



You can get the sound of a preamble dance on 25th Dec 2022 from:

<https://www.youtube.com/watch?v=VTxh74AnpmU>

More images at:

<https://apimagesblog.com/blog/2018/1/5/bear-dance-ritual-connects-romania-with-the-past>

[191 Comanesti Photos and Premium High Res Pictures - Getty Images](#)

@ Prof. Adrian Podoleanu



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