



NETLAS NEWSLETTER 9-2022

Remembering Queen Elizabeth II

Queen Elizabeth II had a long association with [Kent University](#). From the signing of the [University Charter in 1965](#), to a **Canterbury campus visit in 1987**, and the opening of the **Medway campus in 2002**, her relationship with Kent resulted in many fond and happy memories among students and staff. A record of the Queen's visit to Canterbury in March 1987 was filmed by Les Holtum, a keen amateur filmmaker, can be seen [here](#).



The Queen meets students
on her visit to open the
Cornwallis Extension in
1987.

Queen Elizabeth II's visit to our Medway campus

The Queen's second visit to Kent was when she opened the Medway campus in 2002, a collaboration between the University of Kent, Canterbury Christ Church University and the University of Greenwich



Vice-Chancellor's statement on behalf of the University

We are deeply saddened by the death of Her Majesty Queen Elizabeth II. We stand united in grief with the nation, the Commonwealth and all those around the world who have been touched by her dignity, devotion, exemplary service, and unfailing sense of duty.

The thoughts of our entire University community are with the Royal Family at this time.

Professor Karen Cox | Vice-Chancellor and President

Books of condolence have been opened at the libraries at our Canterbury and Medway campuses to allow our staff and students to pay their respects.



An online version of Books of condolence is also available at

[Book of Condolence - Remembering Queen Elizabeth II - University of Kent](#)



NETLAS Autumn School
Technical University of Darmstadt (TUDA)



NETLAS Autumn School is scheduled to take place at [Technical University of Darmstadt \(TUDA\)](#), Germany

04-07 October 2022

Please check the program on the [NETLAS website](#)



Program of the NETLAS Autumn School

04th-7th October 2022

The event will start on 4th of October 2022 with welcome remarks given by the NETLAS Autumn School organizer Prof. Sascha Preu. The rest of the day will continue with the NETLAS ESRs presentations about their latest research results, where all ESRs will deliver oral presentations of 12 minutes each followed by Q&A. There will be soft skills lectures arranged by TUDA on the 2nd day about Research and Innovation and Patenting and IP, followed by lectures given by NETLAS beneficiary & associated partners. The day will end with the conference dinner.

Half of the 3rd day (6th of October 2022) is dedicated to Industry, while the other half day to the lectures given by a NETLAS beneficiary & a NETLAS associated partner and finished with a tour of the [THz devices and systems laboratory](#), TUDA, led by Prof. Sascha Preu.

Last day of the event (7th October 2022) is dedicated to a Student Activity, where ESRs are divided into 5 pairs of 2 ESRs each. Within the pair, each student will present to each other their research, followed by discussions on the delivery. The rest of the ESRs which don't present, will act as judges, ask questions and will give marks/feedback on the delivery of presentation. This is a good exercise to present their research to a non-specialist, in making their research accessible to others. Supervisors will not have any input in this activity, but they will be in audience. A print screen of the program is presented below.

Schedule:	Tuesday Oct. 4th	Wednesday Oct. 5th	Thursday Oct. 6th (Industry day)	Friday Oct. 7th
9:00-10:00	Arrival	Simone Lühl (TU Darmstadt) How to turn Research into Innovation! (Soft skills: Entrepreneurship)	9:00-10:00h: Christian Neumeyr (VERTILAS)	Student Activity: Irene and Mojdeh
10:00-10:45			10:00-10:45h: Patrick Montague (NKT): Research at NKT Photonics	Student Activity: Esteban and Sacha
10:45-11:00		Coffee Break	Coffee Break	Coffee Break
11:00-11:45		Maximilian Knaus (WSL Patent Attorneys) Soft Skills: Patenting and IP	11:00-11:45h: Bettina Heise (Recendt): Optical Techniques in Non-Destructive Testing	Student Activity: Alejandro and Marie
11:45-12:30			11:45-12:30h: Vladimir Shidlovski (Superlum) Remote: SLDs and SOAs at 680-1060 nm	Ifte and Gopika Asim and Ammar
12:30-13:30		Lunch	Lunch	Lunch
13:30-14:30	Welcome remarks	13:30-14:30h: Ranjan Rajendram (UCL): Clinical Imaging of the eye	13:30-14:45h: Taranjit Tatla (LNWH): OCT Applications in Head & Neck	Departure
14:30-15:15	ESR talks: ESR 1-7	14:30-15:15h: Sascha Preu (TUDA): Non-Destructive Testing with Terahertz Radiation	14:45-15:30h: Anirban Mukhopadhyay (TUDA): Federated Continual Learning for medical imaging	
15:15-15:30	Coffee Break	Coffee Break	Coffee Break (15:30-15:45)	
15:30-16:30	ESR talks: ESR 8-15	15:30-16:30h: Zachary Taylor (Aalto)	Labtour	
16:30-17:30	Supervisory board meeting	16:30-17:30h: Adrian Podoleanu (UKent)		
17:30-18:00				
18:00- open end		Conference Dinner at Grohe		



SECONDMENTS

Netlas PhD Student [Sacha Grelet](#)

Host: [NKT Photonics](#)

**Secondment started on 30th
August 2022**

University of Kent,

[Applied Optics Group \(AOG\)](#)



Duration: four months

PhD Project: Time Stretched Pulse Supercontinuum (SPSC)
swept laser source

During my last stay at the University of Kent, I learned about OCT systems and the way OCT's parameters are influenced by swept source parameters.

Since then, I worked on two new designs of swept sources to improve our multi-MHz OCT system. The first one is a rework of the previous swept source, still working at 80 MHz, with an improved power and bandwidth. I hope it would make it suitable for ultrafast analysis, for example for cytometry. The second design aims to reduce the repetition rate to 10 MHz and improve all the OCT parameters to aim for in vivo eye imaging.

I demonstrated in NKT Photonics' labs a proof of concept for both designs and now we need to evaluate their real potential of SSOCT. Therefore, I travelled to the University of Kent and joined the Applied Optics Group (AOG) once again. I will first need to re-build and characterize the two sources. Then, with the supervision of the AOG members, I will hopefully obtain wonderful images! Only time will tell...

Whatever is the conclusion of this work, it is a pleasure to be in Canterbury once again and share the energy and optimism of this group!



SECONDMENTS

Netlas PhD Student [Gopika Venugopal](#)

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



Secondment started on 23rd September 2022 at
Research Center for Materials Characterization and Non-
Destructive Testing, RECENDT GmbH, Linz, Austria

Duration: two months and a half

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

Brief description for Gopika's Secondment plan:

- Support in design of new spectral domain/Fourier domain OCT
- Support in assembling and adjustment of new spectral domain/Fourier domain OCT
- Testing measurement schemes with MIR-OCT
- Getting knowledge about Non-destructive testing (NDT) applications in optics area
- Support in machine learning-based image data analysis



Bioscience Journal Club

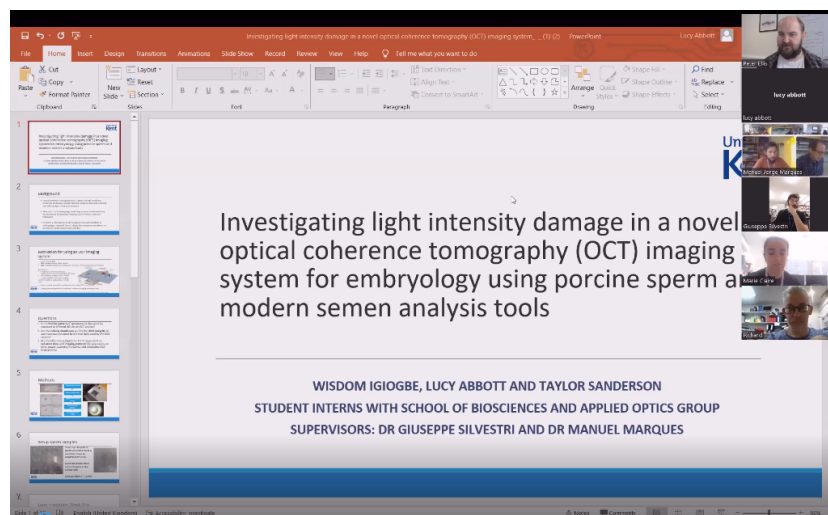
13th September 2022, 10-11 am UK time

Presentation given by **Wisdom Igiogbe** (undergraduate student 3rd year, School of Biosciences, doing a year in industry), **Lucy Abbott** (undergraduate student 3rd year, School of Physical Sciences/AOG PhD Student starting in September 2022) and **Taylor Sanderson** (4th year MPhys, School of Physical Sciences) with the title:

'Investigating light intensity damage in a novel OCT imaging system for embryology using porcine sperm and modern semen analysis tools'

[Wisdom, Lucy and Taylor](#) were between the undergraduate students which won the [Summer Vacation Research Competition \(SVRC\) 2022](#)

The results presented were obtained as a collaboration summer 2022 project between School of Biosciences and School of Physical Sciences, Kent University: Wisdom Igiogbe was working with [Dr Giuseppe Silvestri](#), (School of Biosciences), on Reproductive Sciences, while Lucy Abbott & Taylor Sanderson were working with [Dr Manuel Marques](#), (School of Physical Sciences), on Biomedical Optics. A few slides from their joint presentation will follow.





Motivation for using an OCT imaging system

- Images in **real time**
- **Non-invasive** imaging of the sample
- **High resolution** images can be obtained to provide 3D characterisation of embryos

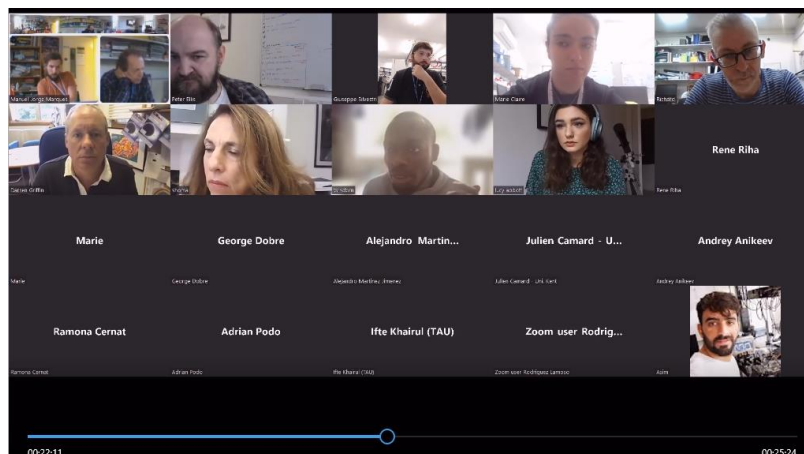
Our System:

- SLD (Super-Luminescent Diode) optical source, central wavelength 1077.9nm
- Max power at imaging probe ~20mW
- ~1mW would be used when imaging and SLD would be replaced by a tunable Laser
- Sperm samples beyond the resolution of the system
- Imaging system bypassed for irradiation, simulated imaging techniques only

University of Kent

Diagram from "Time-lapse Optical Coherence Tomography Embryo Imaging with Minimal Disturbance", used with permission of Dr Manuel Marques, adapted to our set-up by Lucy Abbott and Taylor Sanderson.

The presentation was very well received and opened a long session of questions (**having 7 NETLAS ESRs in attendance**)



Acknowledgments

- Dr Giuseppe Silvestri
- Dr Manuel Marques
- Marie-Claire Aquilina
- Carla Canedo Ribeiro
- Lucy Abbott
- Taylor Sanderson
- and the Applied Optics Group
- School of Biosciences

University of Kent

Slides from the presentation given by Wisdom, Lucy and Taylor (undergraduate students, Kent University) which was recorded with the students' consent: from left to right, Wisdon Igiogbe, Carla Canedo Ribeiro, Marie-Claire Aquilina, Dr. Giuseppe Silvestri, Lucy Abbott, Taylor Sanderson and Dr. Manuel Marques

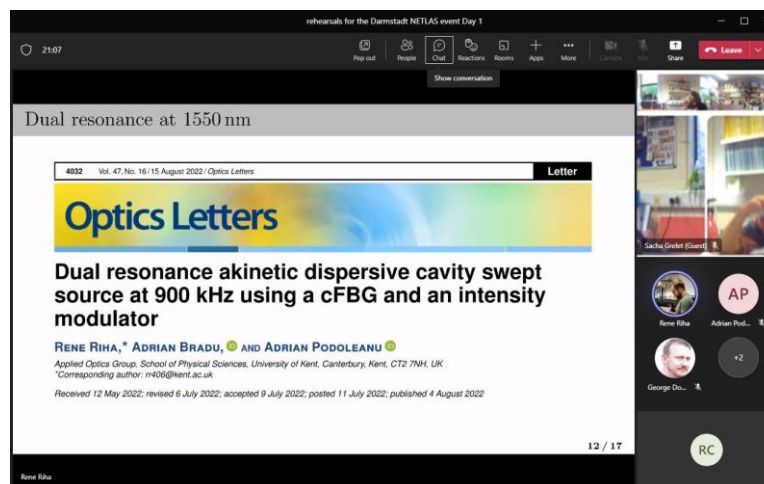


AOG rehearsal presentation for [NETLAS Autumn School](#) in Darmstadt (4-7 October 2022)

[NETLAS PhD Student René Riha](#)

27th September 2022 at 12 pm

[NETLAS PhD Student René Riha](#) had a rehearsal of his talk “*Dual resonance wavelength-tunable laser – an akinetic FDML-like swept source*” which is going to be presented at the [NETLAS Autumn School](#), Technical University of Darmstadt (TUDA), 4-7th October 2022. A few slides from Rene’s rehearsal will follow.



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



AOG rehearsal presentation for [NETLAS Autumn School](#) in Darmstadt (4-7 October 2022)

[NETLAS PhD Student Sascha Grelet](#)

27th September 2022 at 12 pm

[NETLAS PhD Student Sascha Grelet](#) had a rehearsal of his talk “*Sweeping the at speed of light: ANSi Supercontinuum and Time Stretch for High-Speed SS-OCT*” which is going to be presented at the [NETLAS Autumn School](#), Technical University of Darmstadt (TUDA), 4-7th October 2022. A few slides from Sacha’s rehearsal will follow.

The image displays two screenshots from a Zoom rehearsal presentation. The top screenshot shows a title slide with the text: "Sweeping at the speed of light: ANDi Supercontinuum and Time Stretch for High-Speed SS-OCT". Below the title, the authors are listed: Sacha Grelet^{1,2,*}, Patrick Bowen Montague¹, and Adrian Podoleanu². The affiliations are: ¹ NKT Photonics A/S, Birkelandsgade 4, DK-3460, Birkeland, Denmark; ² School of Physical Sciences, University of Kent, CT2 7NH, Canterbury, UK. The email address sacha.grelet@nktphotonics.com is provided. The event is identified as TUD NETLAS Autumn School-04.10.2022. Logos for the University of Kent, NKT Photonics, and NetLaS are visible. The bottom screenshot shows an "Acknowledgement" slide. It features a group photo of the AOG team and lists the following names: Adrian Podoleanu, Adrian F. Uceda, George Dobie, Michael Hughes, Manuel Marques, Giannis Nteroli, Gopika Venugopal, Julien Camard, and Rene Riba. It also lists names from NKT Photonics: Patrick Bowen Montague, Ole Bang, Rasmus D. Engelsholm, and Poul Varming. Names from AOG are listed as Erik N. Christensen, Dung Han Yeh, Andrea Pertoldi, and Anamika K. Nair. The slide includes logos for the University of Kent, AOG, and NetLaS. At the bottom, it mentions funding from the EC Horizon 2020 research and innovation programme Marie Skłodowska-Curie NETLAS ITN grant agreement No 860807. The date is noted as Sacha Grelet - NETLAS Workshop DTU - 03 March 2022.

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

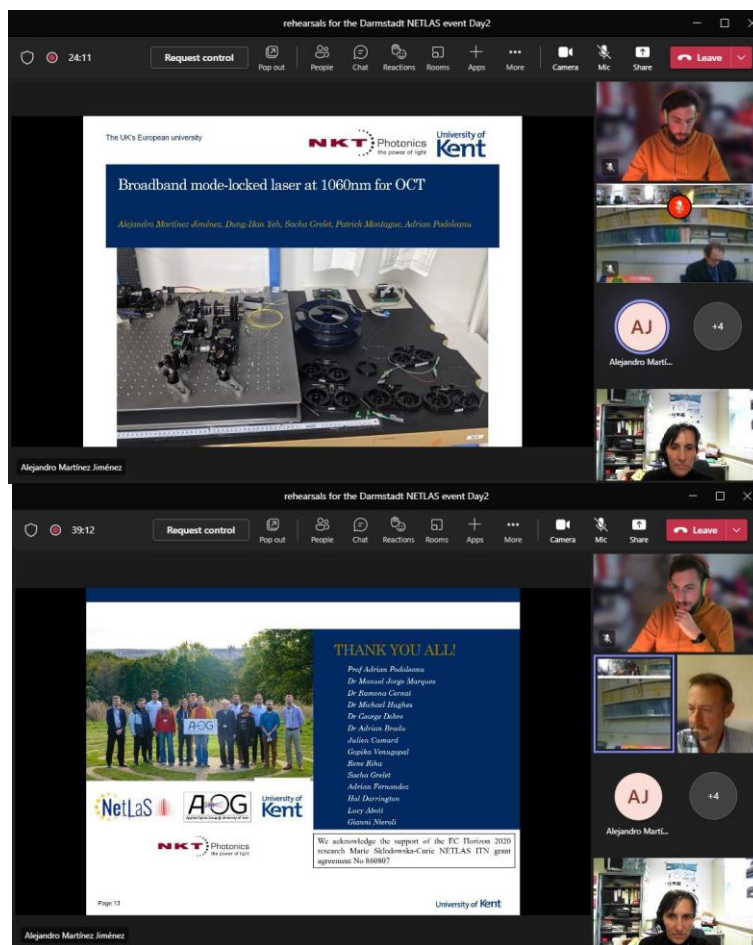


AOG rehearsal presentation for [NETLAS Autumn School](#) in Darmstadt (4-7 October 2022)

[NETLAS PhD Student Alejandro Martinez Jimenez](#)

30th September 2022 at 3 pm UK time

[NETLAS PhD Student Alejandro Martinez Jimenez](#) had a rehearsal of his talk “*Broadband mode-locked laser at 1060 nm for OCT*”, which is going to be presented at the [NETLAS Autumn School](#), Technical University of Darmstadt (TUDA), 4-7th October 2022. A few slides from Alejandro’s rehearsal are presented below.



Slides from the [NETLAS PhD Student Alejandro Martinez Jimenez](#) presentation rehearsal

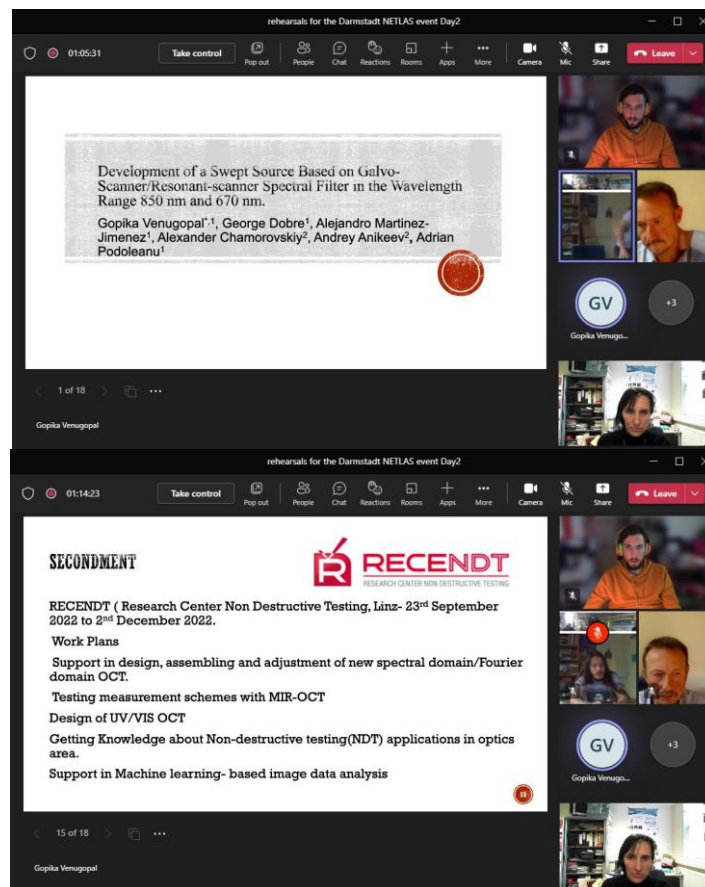


AOG rehearsal presentation for [NETLAS Autumn School](#) in Darmstadt (4-7 October 2022)

[NETLAS PhD Student Gopika Venugopal](#)

30th September 2022 at 3 pm UK time

[NETLAS PhD Student Gopika Venugopal](#) had a rehearsal of her talk *“Development of a Swept Source based on Galvo-Scanner/Resonant - scanner Spectral Filter in the Wavelength Range 850 nm and 670 nm”*, which is going to be presented at the [NETLAS Autumn School](#), Technical University of Darmstadt (TUDA), 4-7th October 2022. A few slides from Gopika’s rehearsal presentation are presented below.



Slides from the [NETLAS PhD Student Gopika Venugopal](#) presentation rehearsal



On Thursday 8th September 2022, the Applied Optics Group was honoured by the visit of Yann Amouroux, [Optica](#)'s Director for Europe. Although many AOG members were away at the 25th Congress of the International Commission for Optics [ICO-25](#) Conference in Dresden, Germany (5-9 Sept 2022), fruitful discussions took place in the University's Photonics Centre and over a nice lunch, for Yann's first visit since 2019's pre-covid times. This visit was a great occasion to raise questions about our Student Chapter (new Kent Union society status, recruitment of new members etc.) and to hear the latest news coming from Optica and other student groups. We were especially pleased to hear that a new Chapter had just been started in Southampton and we aim to visit them very soon!



Figure 1: From left to right, Yann Amouroux (Dir. Optica Europe), Julien Camard (AOG PhD), Manuel J. Marques (AOG Lecturer) and Lucy Abbott (AOG PhD)

For more information about starting or developing a Student Chapter, you can contact [Yann Amouroux](#). For more information about the Chapter at Kent, please contact its President, [NETLAS PhD Student Alejandro Martinez Jimenez](#) at a.martinez-jimenez@kent.ac.uk, or visit the [Chapter's website](#)!



CONFERENCES

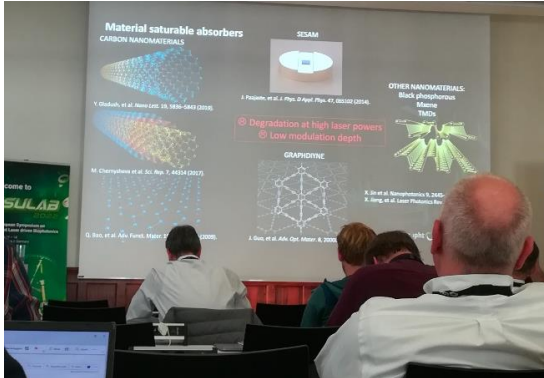
[NETLAS PhD Student Sacha Grelet](#) attended the [European Symposium on Ultrafast Laser driven Biophotonics](#) (ESULaB 2022) September 11 – 14, 2022 | Jena, Germany

ESULab 2022: a dive into bioscience

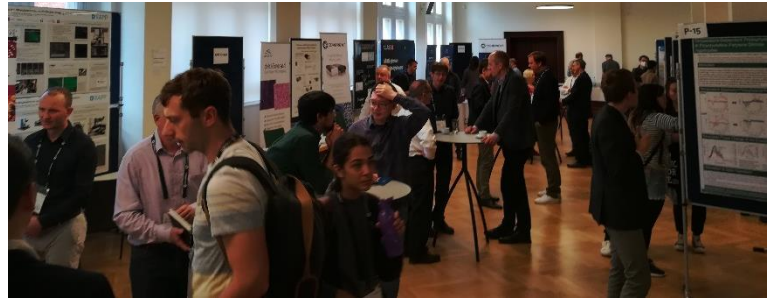
In August 2022, Dr. Peter Vogt (Director of Sales Scientific Research & Instrumentation at Coherent Inc.) invited me to attend the [European Symposium on Ultrafast Laser driven Biophotonics \(ESULAB 2022\)](#) that he organized in collaboration with Prof. Jurgen Popp (scientific director of the Leibniz Institute of Photonic Technology).

The symposium took place in Jena, Germany, between 11-14 September and was sponsored by [Coherent](#) mainly and multiple other companies (APE, Class5, Asphericon...). The program of the symposium can be found [here](#). The speakers presented their work on the use of ultrafast laser for biophotonics. This field is very broad, and I learned about imaging through multiphoton process, light-matter interaction for surgery by example, Quantum imaging. As a laser specialist, I had very little knowledge about most of the topics discussed, but it gave me nonetheless a first understanding of all the possibilities that ultrafast lasers open for biophotonics.

On Monday evening (12th September 2022), there was a poster session where I presented my work "***Fast akinetic swept source for Optical Coherence Tomography***" on swept sources for fast OCT imaging technology. I received many interesting questions from diverse experts in the field, which encouraged me to explain my project from a different perspective. That was an extremely interesting exercise. During that evening, I also had the chance to meet other students and discuss their projects.



One of the talks in the main room of the venue



The venue just before the poster session



Peter Vogt and prof. Jurgen Popp opening the conference Dinner

The event took place at [Jena](#), a city close to Leibniz and Dresden, where I discovered that many famous researchers in optics worked there: [Ernst Abbe](#), [Carl Zeiss](#)...



Ernst Abbe memorial



One of Zeiss' first planetarium


In general, that symposium was a fantastic experience to learn more about the application of laser science. I think it will influence my future work, when designing my lasers but also when I will be looking for a job!

Text and photography by @[Sacha Grelet](#)



CONFERENCES

NETLAS Beneficiary **Prof. Mircea Guina**, head of [Optoelectronics Research Center](#), [Faculty of Engineering and Natural Sciences](#), Tampere University, Finland, was attending the conference **European Conference on Optical Communication (ECOC)**, Basel, Switzerland, 18 – 22 September 2022, as an invited speaker with the presentation '**Hybrid integration of GaSb optoelectronics with thick-SOI and SiN PIC platforms**'. His presentation was scheduled on 21st September 2022.



About ECOC Programme Special Events Author Info Registration Venue Sponsors & Media Contact

University of Southampton, UK

SC2 – Photonic Devices & Technologies

Thomas Ferreira de Lima NEC Laboratories America, Inc., USA	Photonic Neural Networks for Analog-Digital Processing T. Ferreira de Lima NEC Laboratories America, Inc., USA
Mircea Guina Tampere University, Finland	Hybrid integration of GaSb optoelectronics with thick-SOI and SiN PIC platforms M. Guina Tampere University, Finland
Sangyoon Han DGIST, Republic of Korea	Silicon photonic MEMS for programmable photonics S. Han ⁽¹⁾ , and K. Yu ⁽²⁾ ⁽¹⁾ DGIST, Republic of Korea ⁽²⁾ KAIST, Republic of Korea

Full program of the conference can be found [here](#)



COMPANY VISIT - NKT Photonics UK



On Friday **16th September 2022**, a delegation of seven AOG researchers made their way to Hampshire for a visit of the **UK branch of NKT Photonics**, one of the world's leading companies in ultrafast, high power and supercontinuum lasers.

In the photo from left to right: Dr. Manuel Marques, AOG PhD Student Julien Camard, AOG PhD Student Lucy Abbott, NETLAS PhD Student Rene Riha, AOG PhD Student Adrian Fernandez, Dr Agata Witkowska, senior optical engineer NKT Photonics and NETLAS PhD Student Sacha Grelet (with the NETLAS Manager Dr Ramona Cernat taking the photo).

The initial plan was for [NETLAS PhD Student Sacha Grelet](#), who spends his research time between NKT Photonics Denmark and University of Kent, to travel on his own and collect a laser for his research project. Sacha suggested to involve the rest of the AOG members and the [Optica Student Chapter](#) to arrange a company visit, which turned out to be a great idea!

The visit started by a tour of the production lab given by Burly Cumberland and Tom Strudly, respectively Senior Engineering Manager and Senior Optical Engineer in the Ultrafast Fiber Lasers department at NKT Photonics UK. The Southampton division is mostly focused on the development and production of ultrafast lasers. We were introduced to their new Kanban production process: when an operator starts the assembly of a new laser module, they pick up components from dedicated bins placed over their workstation. When a first bin becomes empty, a second one is brought forward and an order is triggered. This ensures a constant flow of parts to avoid any shortage. This process requires fine tuning to reach full efficiency: for a given component, the number of items to order has to be correlated to the lead time, which, as Burly mentioned, has greatly lengthened for electronic components.



After that, we visited the test labs, where lasers are tested for extreme temperature and pressure conditions in environmental chambers. Mechanical resistance is also tested both on site (resistance to shock) and in another company (vibration assays).

For the next step of the tour, we were shown the R&D lab, where critical cavity alignments are optimised. Temperature changes can lead to variations of a laser's emission properties such as its repetition rate, so water cooling is used in some devices to ensure optimal temperature stability.

During the last hour of the visit, we gathered in the meeting room where Dr Agata Witkowska, senior optical engineer, gave us an overview of the branch's Aerospace and Defense activities, including high energy laser for weaponry applications, LIDAR for wind measurement or GPS-free fibre-based positioning. We then engaged in fruitful discussions about interactions between academia and industry, European collaboration, and gender gap in science.

Thank you NKT Photonics for accommodating our visit! We left Southampton with a laser in the boot and the sentiment of a day well spent!

Article written by [AOG PhD Student Julien Camard](#)



@left Photo taken by Dr. Manuel Marques behind the NKT Photonics buildings with the view of the [Solent](#); @right photo taken by Dr. Ramona Cernat with the laser being loaded in the car



University of Kent Welcome Fair – The Optica Student Chapter becomes a Student Society!

Friday 23rd September 2022, the [Optica Student Chapter at Kent](#) held a stall at Kent Union’s Welcome Fair for the first time, after it officially became part of the University’s student societies at the end of this Summer. The idea behind this new status is to improve the connection with the student community on campus and simplify the treasury.



@Sacha Grelet &
Julien Camard
photo by Lucy Abbott



@photo by Sacha Grelet



photo by Lucy Abbott

Throughout the day, many students visited our stall and competed in the complex “*Upside Down Maze*” game, in which they had to complete a maze on a whiteboard with special prism goggles that flip the vision around. The fastest time of the day was an impressive 10 seconds, and the winner won a £20 voucher. The results will be soon communicated to students, and they will be invited to a first social event on campus, where will we be playing board games and sharing drinks! @bottom photos by Julien Camard.



PUBLICATIONS

Bias-Dependent Carrier Dynamics and Terahertz Performance of ErAs:In(AI)GaAs Photoconductors

U. Nandi, M. Scheer, H. Lu, J. C. Norman, A. C. Gossard and **S. Preu**

IEEE Transactions on Terahertz Science and Technology, vol. 12, no. 4, pp. 353-362, July 2022

DOI: [10.1109/TTHZ.2022.3170523](https://doi.org/10.1109/TTHZ.2022.3170523)

Abstract:

In this article, we present the investigation of bias-dependent carrier dynamics of ErAs:In(AI)GaAs superlattice (SL) photoconductors and compare the results to a theoretical model. The carrier dynamics for materials without InAlAs layer can be modeled by a monoexponential decay that features a linear decrease in the carrier lifetime with bias. For a 10 mW laser power, the bias-free lifetime for this material is 440 fs and decreases to 97 fs at 72 kV/cm. For materials consisting of an SL with an absorbing InGaAs and a high-barrier InAlAs layer, the carrier lifetime determined by differential transmission features a bias-dependent fast decay (~ 100 fs) followed by a bias-independent slower decay (~ 2.5 ps). [Read More](#)

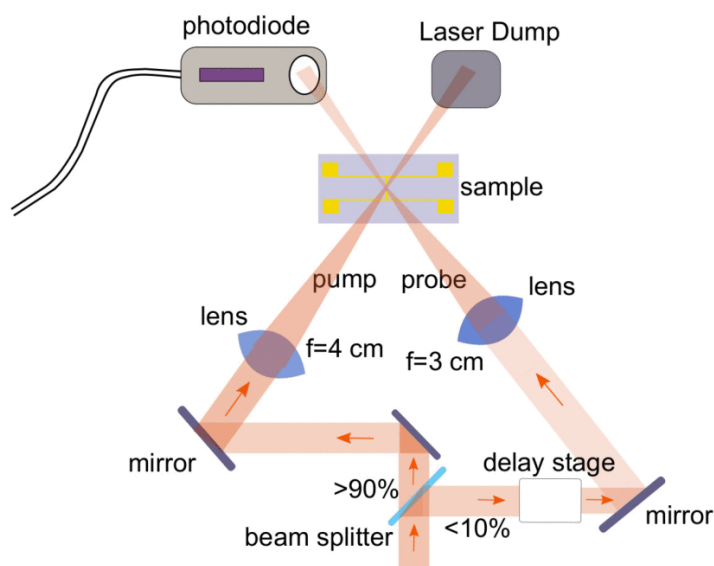


Fig.2 Schematic diagram of the DT measurement setup indicating both the pump ($> 90\%$) and probe ($< 10\%$) beams focused into the photoconductor sample. The beam splitter divides the pump-probe laser power, mirrors/lens guide the laser beam, and the delay stage scans the lifetime signal.

Optical coherence tomography

A. PODOLEANU

Journal of Microscopy, Volume 247, Issue 3, Pages: 209-299, September 2012

<https://doi.org/10.1111/j.1365-2818.2012.03619.x>

Invited Review

Summary

The review provides a concise explanation of principles of operation of different optical coherence tomography methods. A comparative analysis of their advantages and disadvantages is presented in relation to specific applications. The review will assist the reader in making an educated choice on the most suitable optical coherence tomography method to be used in a particular application. [Read More](#)

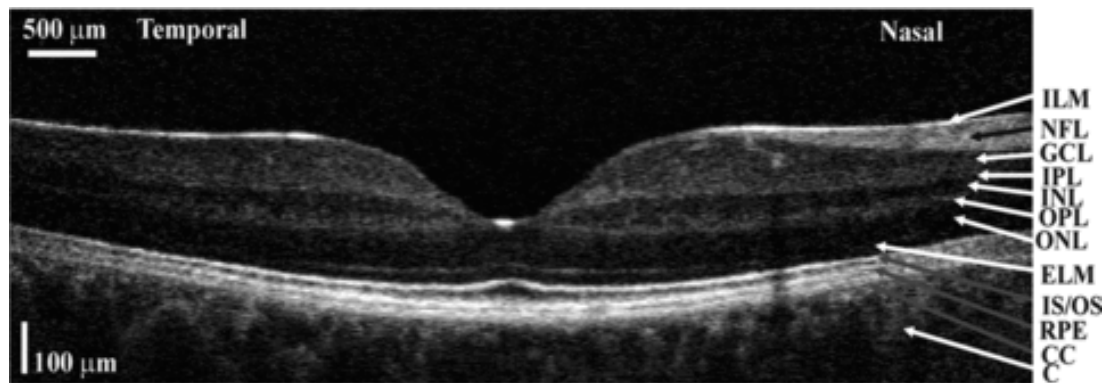


Fig.1 Cross-section image of the retina using an *en face* time domain OCT system driven by a large bandwidth source (**Cucu *et al.*, 2006**). Lateral size: 7.5 mm, vertical size is along depth, 0.725 mm measured in the retina.

ILM, inner limiting membrane; NFL, nerve fibre layer; GCL, ganglion cell layer; IPL, inner plexiform layer; INL, inner nuclear layer; OPL, outer plexiform layer;

ONL, outer nuclear layer; ELM, external limiting membrane; IS/OS, junction between the inner and outer photoreceptors; RPE, retinal pigment epithelium; CC, choriocapillaris; C, choroid.



Student Theses -Optical Coherence Tomography News

MEMS-VCSEL swept-source optical coherence tomography for multi-MHz endoscopic structural and angiographic imaging

By Jason Zhang



[ExploreDSpace@MIT](#) Jul 8

2022 [Gastroenterology](#), [Probes](#), [Student Theses](#)

Swept-source optical coherence tomography (SS-OCT) enables volumetric imaging of subsurface structure, but applications requiring wide fields of view, rapid imaging, and higher resolutions have been challenging because of the need for multi-MHz A-scan rates. Until now, achieving multi-MHz A-scan rates has been limited to Fourier-domain mode-locked lasers or stretched-pulse lasers. We describe a microelectromechanical-system, vertical-cavity surface-emitting laser (MEMS-VCSEL) for SS-OCT at A-scan rates of 2.4 and 3.0 MHz using a dual-channel acquisition system. Dual-channel operation enables simultaneous acquisition of Mach-Zehnder interferometer (MZI) fringes for sweep-to-sweep calibration and resampling, overcoming inherent optical clock limitations in state-of-the-art digitizers. We demonstrate ...

[Read Full Article](#)



Nobel Prizes in Physics

The Nobel Prize in Physics has been awarded 115 times to 219 Nobel Prize laureates between 1901 and 2021. [John Bardeen](#) is the only laureate who has been awarded the Nobel Prize in Physics twice, in 1956 and 1972. This means that a total of 218 individuals have received the Nobel Prize in Physics.



The Nobel Prize in Physics 2022 has not been awarded yet. It will be announced on **Tuesday 4 October, 11:45 CEST at the earliest**

The Nobel Prize in Physics 2018 :

“for ground breaking inventions in the field of laser physics”

[Arthur Ashkin](#) “for the optical tweezers and their application to biological systems”

[Gérard Mourou](#) and [Donna Strickland](#) “for their method of generating high-intensity, ultra-short optical pulses”



At the 25th Congress of the International Commission for Optics [ICO-25](#) Conference in Dresden, Germany (5-9 Sept 2022), NETLAS PhD Students [Irene Rodriguez Lamoso](#), [Mojdeh Vakili Tabatabaei](#), [Muhammad Ammar Javaid](#), [Sacha Grelet](#), [Alejandro Martinez Jimenez](#), [Gopika Venugopal](#), and [Rene Riha](#), together with NETLAS PI Coordinator [Prof. Adrian Podoleanu](#) and NETLAS Deputy [Dr. George Dobre](#), had the opportunity to attend and listen to the [Plenary Speaker](#) Prof. [Gérard Mourou](#), one of the Nobel prize winners which attended this conference. Check the Plenary Speaker program [here](#).



Nobel laureate Prof. Gerard Mourou giving the opening talk at the ICO Congress in Dresden 2022 @photo taken by **Dr George Dobre**



Feedback about [ICO 25 conference](#), 5-9 September 2022, Dresden, Germany,

by NETLAS PhD Student [Mojdeh Vakili](#)

‘This conference was supposed to be held back in 2020 in Dresden but because of the pandemic, they made it in 2022. The slogan was "**Advancing Society with Light**", emphasizing the importance of modern light technology for society. ICO includes numerous well-known academic societies such as OPTICA, SPIE, Photonics society of IEEE.

One of the aspects that I really liked about this conference was the contribution of fantastic **Nobel Prize awarded scientists** by their talks. **Prof. Gerald Mourou** talked about ultra-intense laser pulses that can be generated by Chirped Pulse Amplification (CPA). CPA can be used in different areas such as the generation of high-energy protons and neutrons for cancer treatment. **Prof. Stefan Hell** talked about how they defeated the diffraction barrier, which is by carrying the tiny molecules to fluorescent and dark states to make them visible for a short period of detection. **Prof. Reinhard Genzel** started with General Relativity Theory of Einstein, then carried on with black hole concept and his group's contributions to the study of mass distribution in the Center of Milky Way, complimented by **Prof. Karsten Danzmann's** talk about how they came to the conclusion that instead of looking to the universe which is mostly in black, we can listen to it.



Prof. Michal Lipson took us on a journey by explaining how she started with the field of silicon photonics and the starting point which was finding an answer to a big question back at that time: "how to get light in and out of Silicon".

I found it practical that they divided each day into different sessions which were running in parallel, and we had the opportunity to move around between rooms and participate in the presentations that we find more relevant. I had a chance to have a short discussion with some speakers about my project and exchange ideas. Also, I was lucky to find a backup plan for the problem that I am currently dealing with in my project which is etching the material that I am using with one of the industrial partners in the conference.

In a nutshell, I enjoyed my time in Dresden with my colleague [Irene Lamoso](#), people from Kent University, Prof. Adrian Podoleanu, and would like to thank Prof. Sascha Preu to give me the opportunity to participate in this event, which was my first official conference experience'.



Dinner with lovely people 😊 @[Moideh Vakili](#)



NETLAS Associated Partner OCTLIGHT is honoured to have been selected as one of the beneficiaries of the Eurostars™ programme

Eurostars has granted public R&D funding to a joint international collaboration between [Wavesense Engineering](#), [Medical University of Vienna](#) and [OCTLIGHT](#). The consortium will develop a **novel ophthalmic multimodal optical coherence tomography (OCT) device** that can provide complete optical and anatomical information of patient's eye to improve the diagnosis and treatment of eye diseases.

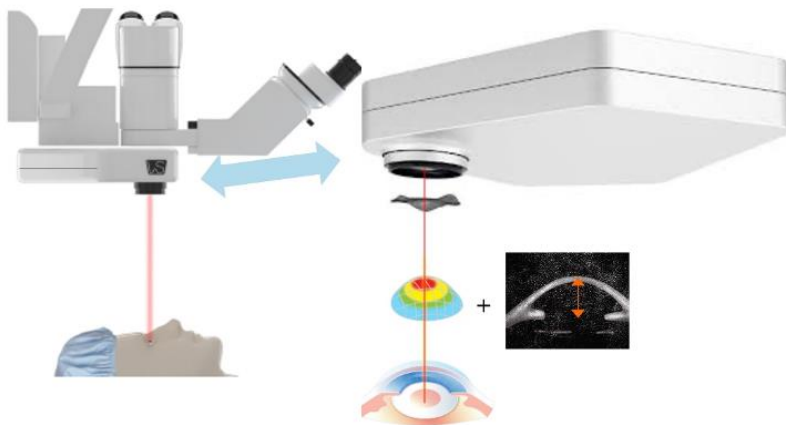


Figure caption: "A **Digital OCT-Aberrometry (DOCTA)** device will be developed in the project that can enable wavefront aberrometry together with the conventional OCT imaging of the human eye. Flexible & robust design will allow the sample arm to be mounted on a surgical microscope and to be used during the surgery."

OCTLIGHT CEO Thor Ansbæk commented: *"This project will not only be an important demonstration of our key enabling technology but will also allow us to further adapt our VCSEL swept source laser to make a cost-efficient solution for applications that require phase stabilization. The patented Highly Efficient Resonator Oscillator (HERO) underpins the unique advantages allowing MHz A-scan speeds, single channel acquisition and phase stable operation".*

Read more about the project in:

- [The official press release](#),
- [Article by optics.org](#).



OPTICS & PHOTONICS NEWS



[Optics & Photonics News Magazine](#)
[September Issue](#)

- [Glasses in a Fraction of a Second](#)
- [Deep Design for Optical Devices](#)
- [The Nonreciprocal Adventures of Light](#)

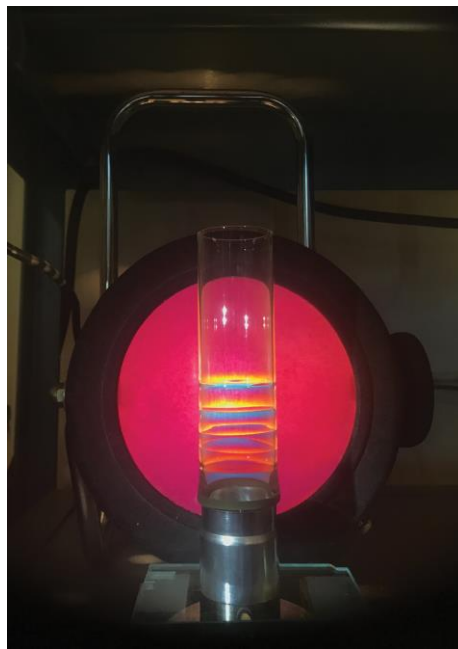
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OPTICS & PHOTONICS NEWS

Image of the Week: [Striking images of optics and photonics, contributed by OPN readers](#)

Birefringence of Glass-Metal Seal



[Birefringence of glass-metal seal viewed through crossed polarizers](#)

—Y. Esashi, M. Tanksalvala, N. Jenkins and H. Green, JILA,
University of Colorado Boulder, CO, USA



About Optica

[Optica](#) (formerly OSA), Advancing Optics and Photonics Worldwide, is the society dedicated to promoting the generation, application, archiving and dissemination of knowledge in the field. **Founded in 1916**, it is the leading organization for scientists, engineers, business professionals, students and others interested in the science of light. Optica's renowned publications, meetings, online resources and in-person activities fuel discoveries, shape real-life applications and accelerate scientific, technical, and educational achievement. Discover more at: [Optica.org](#)

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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!](#)

[The Gravitational Wave Revolution](#)

Dr. David Reitze, Executive Director at LIGO Laboratory and Research Professor at Caltech, joins us for an informative presentation on gravitational waves. He will provide an overview of gravitational wave astrophysics, highlight some of the most exciting discoveries, and discuss how we detect gravitational waves with LIGO using large interferometers capable of sensing displacements to a precision of better than 0.0000000000000000001 meters.



Presented by Dr. David Reitze, Executive Director,
LIGO Laboratory

[Bio](#)

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[LIGO Laboratory](#) Detects Gravitational Waves Using Interferometers



[Coming Soon!](#)

[Fluoride Optical Fibers for the Mid-IR](#)

Thorlabs manufactures an extensive family of mid-IR fluoride fiber using proprietary techniques that provide world-class purity, precision, and strength. These techniques give us excellent control over the fibers' optical and mechanical properties, allowing a wide range of configurations to be drawn. Dave Gardner, Senior Engineer, returns to highlight these techniques, the history of fluoride fiber R&D, and the state of fluoride fiber technology today and in the future.



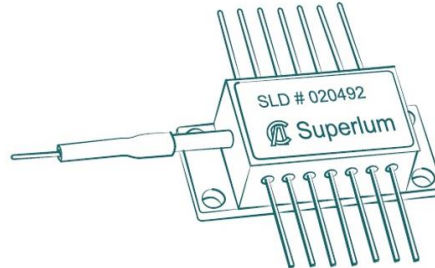
Presented by Dave Gardner, Senior Engineer,
Thorlabs Advanced Photonics

[Bio](#)

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[Fluoride Fibers](#) Are Manufactured In-House



SUPERLUM
The driving pulse of SLD technology

Did you know that 18 years ago on 23.09.2004

SUPERLUM Product line of D-series Broadlighters was upgraded?!

[Superlum](#) efforts on 780-980 nm SLD design allows further improvement of Broadlighter performance. New D-855 device at 855 nm with 80 nm spectrum FWHM is available, with output power typically 6 mW from SM fiber. High-power versions of D-890 and D-830 were developed, the last delivering more than 10 mW with 70 nm spectrum FWHM centered at 830 nm. Additionally, new cost-effective MP-rated Broadlighters were available since September 2004.



New devices for OCT application were available:

- D830-HP2 – 12 mW SM fiber output power and 70 nm FWHM at 830 nm center.
- D855-HP1 – 6 mW SM fiber output power and 80 nm FWHM at 855 nm center.
- D890-HP1 – 6 mW SM fiber output and 150 nm FWHM at 890 nm center.
- D1300-HP1 – 100 nm and 5 mW at 1300 nm.

[Check the NEW Broadband Light Sources.](#)



Meet the SUPERLUM's best-seller
in OCT and spectroscopy:
[cBLMD-T-850-HP](#)

SUPERLUM cBLMD-series Compact Broadband Light Source Modules at 850 nm with 165 nm spectral width and 15mW output power are compact, powerful and very wide spectrum SLD light sources for Ultra High-Resolution OCT, spectroscopy and other applications.

They feature compact dimensions of 190×110×31 mm and a remote control via USB or TTL. Standard models have a FC/APC mating sleeve output. cBLMD modules are available with optional optical isolators.



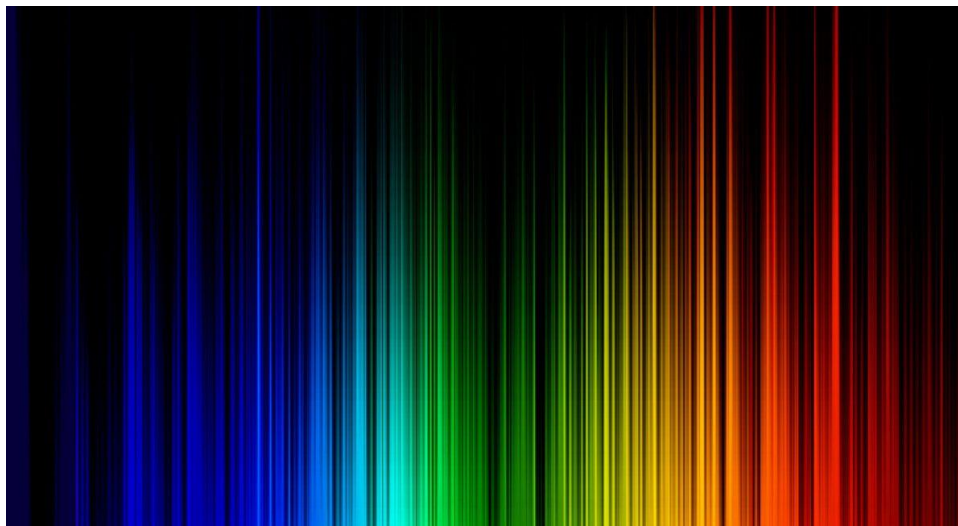
cBLMD light source companion software allows control of output spectrum by changing of driving conditions of SLDs combined. This spectrum control tool can be used to adjust the optical spectrum of the cBLMD light source to meet customer-specific application requirements.

Meet the cBLMD-T-850-HP [here](#).



Single-photon generation

Single photons can be used as information carriers in, e.g., quantum key distribution schemes or as qubits in photonic quantum computers.



You can generate single photons by reducing the output power of your laser to the point where it emits a single photon at a time. Due to the random nature of this approach, the laser emits photons spontaneously and unpredictably, which has advantages and drawbacks.

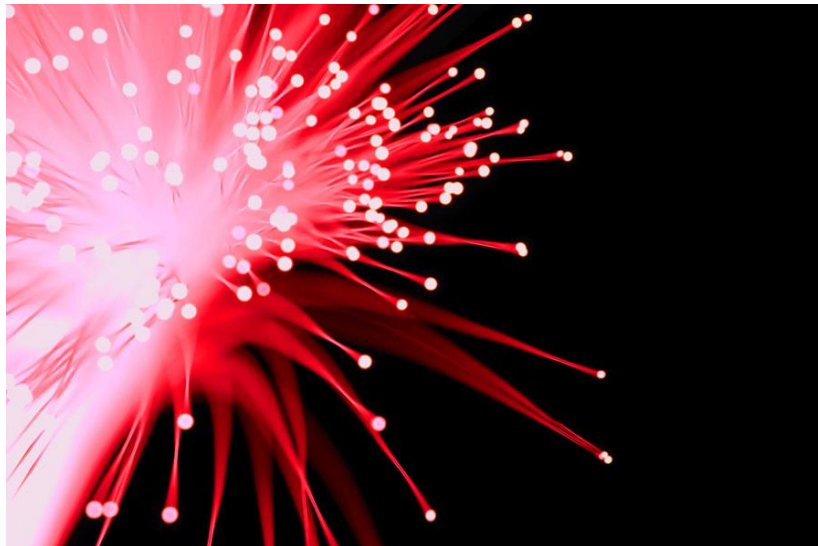
Learn more and see what lasers [NKT Photonics](#) suggest for single-photon generation.

[SHOW ME](#)



Laser Focus World has awarded NKT Photonics two Innovators Awards!

**Meet the winners: CHROMATUNE
and HARMONIK**



According to [Laser Focus World](#), a Gold Honoree “recognizes an excellent innovation, the benefits of which are clear. A Gold-level Innovators Award recipient makes a substantial improvement over previous methods employed, approaches taken, or products/systems used.”

[Head over to Laser Focus World](#) to see all the award winners.



NETWORK EVENTS

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

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