



NETLAS NEWSLETTER 5-2021

This newsletter marks another success in terms of recruitment of this year, we welcome the 13th ESR, Ammar, to NETLAS!

PhD11: Ammar Javaid

Host: Innolume

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



PhD Project: Tunable sampled grating (SG) distributed Bragg reflector DBR laser diode

Previous Education

Master's in Optical Engineering with specialization in Optical Coherence Tomography (OCT) and broad band swept lasers from Sejong University, Seoul, South Korea (2018-2020).

Master thesis work on broadband swept laser by combining the optical spectrum of two semiconductor optical amplifiers and developing a swept laser using a polygon scanner.

Bachelor's in Electrical Engineering with specialization in Electronics Engineering from Pakistan Institute of Engineering and Applied Sciences, Pakistan (2013-2017).



**NETLAS MID TERM MEETING,
Friday 2nd July 2021,**

The Mid-term meeting took place online on 2nd July 2021, where all 13 recruited PhD students attended and presented their background, PhD research project, objectives and training done so far in their hosting institutions. A great surprise was participation & presentation of PhD11 Muhammad Ammar Javaid, who started his fellowship hosted by Innolume just one day before the meeting (01.07.2021). Another fortunate unexpected presence at the meeting was PhD2 Ifte Khairul Alam Bhuiyan already recruited but waiting for a visa appointment at the Indian Embassy. Ifte is so much looking forward to start his position at Tampere University, Finland.

Dr. Fabrizio Martone Research Programme Administrator, European Research Executive Agency, European Commission, Marie Skłodowska-Curie Doctoral Networks, made general comments about the NETLAS project: *This project looks like an EID project, being very industry driven: great team of experts from universities, companies and hospitals. Feeling optimistic about the project's future, confident in catching up despite delays.*

Agenda of the day is presented below.



**AGENDA MID TERM MEETING, 2nd DAY ONLY, NETLAS ITN
Friday 2nd July 2021, ONLINE, ALL**

**All times: CET (Brussels)
Start: 10:30 in Brussels, Denmark and Germany
Start 9:30 in UK and Ireland
Start 11:30 in Finland**

10:30 – 10:35 Adrian Podoleanu, general introduction for the house keeping

10:35 – 10:40 Fabrizio Martone, Research Programme Administrator, EC, Welcome to the Mid Term Meeting

10:40 – 11:15 Adrian Podoleanu, presentation of the NETLAS History, ITN structure and activities and presentation of the UK partner

11:15 - 11:25 Coffee Break

11:25 – 12:00
Presentations of each partner/1, 5 minutes each,
DTU, TUDA, UZL, TAU, Innolume, NKT, Superlum

12:00 – 13:30 Lunch

13:30 – 14:35
Student presentations, 13 x 5 minutes = 65 minutes

14:35 – 15:05
Presentation of each partner/2, 5 minutes each
Centervue, OCTLight, Optores, RECENDT, UCL, NPHL

15:05 – 15:30 Fabrizio Martone, Feedback

15:30 – 15:40 Coffee

15:40 – 15:50 Administration, from the coordinator, Rob Whiteing

15:50 – 16:30 Supervisory board of the network

Closure 16:30

Beneficiaries and the associated partners also presented their teams and expertise, opportunities they offer to training of PhD Students. The ESRs have learned about the great team of NETLAS specialists, who will prepare them ALL for life by training in general skills. Some print screens from the event are presented in the following section.

SUPERLUM

High power Master Oscillator Power Amplifier (MOPA) devices

PhD1: Andrey Anikeev
Supervisor: Alexander Chamorovskiy

NetLaS

Membrane external-cavity surface-emitting lasers (MECSELs)

PhD3: Philipp Tatar-Mathes
Supervisor: Mircea Guina

DTU

Esteban Andres Proano Grijalva
Supervisor: Kresten Yvind
Co-supervisor: Ane Jensen

Electrically pumped MEMS VCSEL

DTU

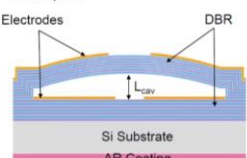

Long wavelength MEMS VCSELs for swept source OCT

Masoud Payandeh
Supervisors: Kresten Yvind and Elizaveta Semenova

MEMS Filter geometry & work principle

TECHNISCHE UNIVERSITÄT DARMSTADT

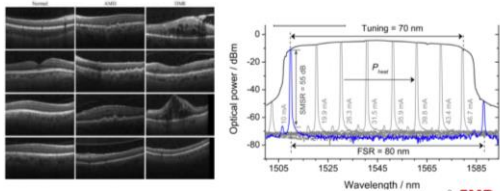
- Plane-concave cavity $\text{SiN}_x/\text{SiO}_2$ (theoretical reflectivity ~ 99.9%)
- Fabrication process based on deposition and etching techniques.
- $\text{FSR} \propto 1/2L_{\text{cav}}$ & Resonant condition
- Movable membrane $\Delta L_{\text{cav}} \rightarrow \Delta \lambda_{\text{emission}}$
- Two ways of tuning:
 - Electrostatically (ΔV)
 - Electrothermally ($=RI^2$)

Development of Electro optically tunable LASERS with large frequency coverage

Mojdeh Vakili
PhD # 8

TECHNISCHE UNIVERSITÄT DARMSTADT





PhD 9 : short wavelength FDML laser

Supervisor: Prof. Robert Huber & Prof. Nino Karpf

3 countries, 3 languages, 3 teams, 3 subjects
Science for human being

MASTER
BIOMEDICAL
ENGINEERING

INTERNSHIP
PS-OCT
CARTRIDGE

PHD
800nm FDML
OCT-OCM

PhD 10 : Super Broadband FDML Laser

Supervisor: Prof. Robert Huber & Prof. Nino Karpf

Joining Date: 01.05.2021

BACHELOR of
ELECTRICAL ENGINEERING

MASTER IN OPTICAL ENGINEERING

PHD
Super Broadband FDML Laser

Phd 11: Tunable sampled grating(SG) distributed Bragg reflector DBR laser diode

M.Ammar Javadi
Phd Student at InnoLume, University of Kent

- Bachelors in Electrical Engineering (2013-2017), Pakistan
- Masters in Optical Engineering (2018-2020), South Korea

The project

Build fast tuning swept-source using low-noise supercontinuum and time-stretch

NKT Photonics

University of Kent

Prof. Adrian Podoleanu

Dr. Patrick Bowen

Rene Riha

contact: rr406@kent.ac.uk

Phd15 Gopika Venugopal

Kochi, Kerala, India

email id: G.Venugopal@kent.ac.uk, gv77@kent.ac.uk

Host: Applied Optics Group, University of Kent, UK



University of Kent
Twitter account: @aghp11; @AOGKent
AOG WEB PAGE; <https://research.kent.ac.uk/appliedoptics/news/>

Updated regularly

STEM for Britain 2019
24th March 2019

Dr Sina Farsu visits the AOG
24th March 2019

AOG at the 9th Image Guided Therapies Network meeting
24th March 2019

AOG at the "European Research Council: Celebration of the University's Success" event
2nd March 2019

AOG at SPIE Photonics West 2019
19th February 2019

AOG at the Hamlyn Christmas Showcase 2018
20th December 2018

EPiRC PhD Scholarship Available
20th December 2018

REBOT project consortium meeting
19th October 2018

Facilities

Terahertz Lab



01.07.2021 | TU Darmstadt | Terahertz Devices and Systems | Sascha Preuß | 7

OCT- Endoscopes

rigid endoscopes

single A-scan

4D video rate endoscopic OCT

Endoscopic mOCT

Endoscopic mOCT clinical trial

Intracorporeal Imaging - collaborations

Andreas Köpcke
mOCT (Klinik, Wittenberg)
EndoVivid (Habe)
Kardiologie (ent 2. Universitätsklinik, Rotterdam (Wang, van der Steen))

Bringing to market a Key Enabling Technology

OCTLIGHT has developed a key enabling technology (KET)

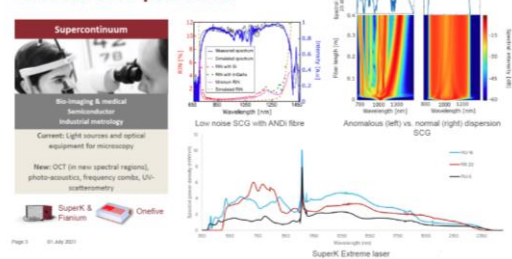
Wavelength tunable VCSEL technology enables a wide range of applications for OEMs within sensing and vision

- ✓ Medical imaging
- ✓ Non destructive testing
- ✓ 3D vision
- ✓ Environmental monitoring
- ✓ Food quality

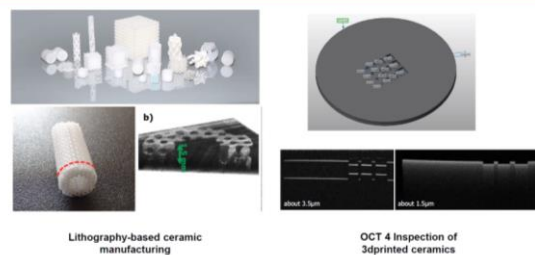


Company presentation

Markets and products



NETLAS- RECENT



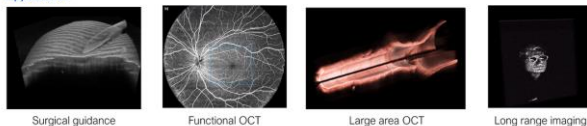
Optores NG-FDML

The only commercially available multi-MHz swept laser

- Performance
- Output power: >100 mW
 - Sweep range: >100 nm
 - 1050 nm, 1310 nm, 1550 nm wavelength
 - >10 mm coherence length
 - Speed: >3.0 MHz
 - Continuous tuning over 100 nm in less than 400 ns



Applications



Mattew et al., Investigative Ophthalmology & Visual Science July 2020; Vol 61, P80107
Wang et al., Biomed Optics Express 10(8) No. 17, 2019



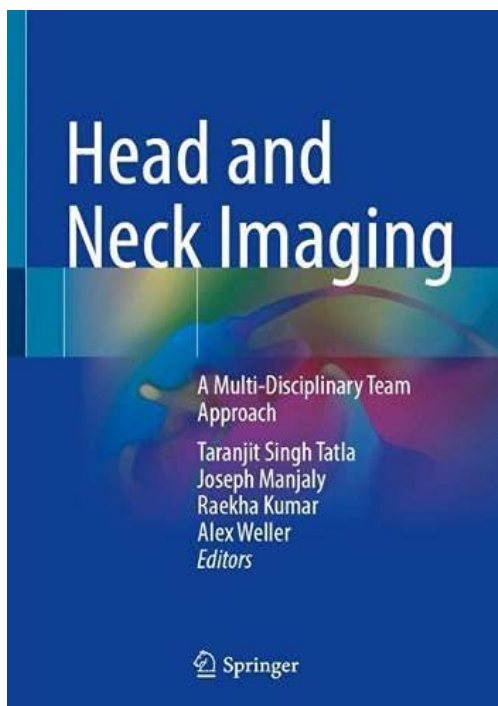


PUBLICATIONS

Head and Neck Imaging: A Multi-Disciplinary Team Approach

[Hardcover – 25 Sept. 2021](#)

by **Taranjit Singh Tatla** (Editor), Joseph
Manjaly (Editor), Raekha Kumar (Editor), Alex
Weller (Editor)



**NETLAS Associated
Partner**

[Dr. Taran Tatla](#),
**Consultant in ENT-Head
and Neck Surgery,
Northwick Park Hospital:**

*“The book will form a good
foundation for any engineering
student wanting to evaluate
novel optical imaging techniques
in the context of ENT-H&N
pathologies and other
established imaging solutions”.*



Presentation

Prof. Adrian Podoleanu, NETLAS Coordinator, delivered *Optical Coherence Tomography*, 60 minutes lecture within the Summer School Lasers in Medicine and Life Sciences, 8/07/2021, Szeged, Hungary, European University Alliance for Global Health (EUGLOH), online; this can be watched on you tube:

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

Conferences to attend

Related Conference of Optical Coherence Tomography

October 23-24, 2021
2nd International Conference on Optics and Photonics
OSAKA, JAPAN



August 09-10, 2021
International Conference on Ophthalmology
OSAKA, JAPAN



August 23-24, 2021
2nd World Congress on Ophthalmology & Optometry
BARCELONA, SPAIN



August 23-24, 2021
16th International Conference on Ophthalmology and Vision Science
BARCELONA, SPAIN



August 27-28, 2021
21st Global Ophthalmologists Annual meeting
SINGAPORE CITY, SINGAPORE



September 03-03, 2021
4th World Congress on Eye and Vision
PARIS, FRANCE





September 13-14, 2021
**20th Asia Pacific
 Ophthalmologists
 Annual Meeting**
 TOKYO, JAPAN



September 27-28, 2021
**31th International
 Congress on
 VisionScience and Eye**
 DUBLIN, IRELAND



October 27-28, 2021
**35th European
 Ophthalmology Congress**
 ZURICH, SWITZERLAND



October 28-29, 2021
**International Conference
 on Euro Ophthalmology
 and Eye Surgery**
 AMSTERDAM, NETHERLANDS



October 28-29, 2021
**4th World Eye and Vision
 Congress**
 AMSTERDAM, NETHERLANDS



October 28-29, 2021
**4th International
 Conference on Eye and
 Vision**
 AMSTERDAM, NETHERLANDS



December 06-07, 2021
**2nd International
 Conference on
 Optometry**
 PARIS, FRANCE



February 23-24, 2022
**31st World Congress on
 Ophthalmology and
 Optometry**
 ROME, ITALY



March 28-29, 2022
**7th International
 Conference & Expo on
 Euro Optometry and
 Vision Science**
 BERLIN, GERMANY



Optical Coherence Tomography Conference Speakers



AOG workshops

We all have skills to share, and we all have skills we would like to develop! With that in mind, the Applied Optics Group (AOG) at the University of Kent is starting this month a series of informal internally run workshops on various topics such as software training (LabVIEW, ImageJ, Blender) or 3D printer use. Most content is expected to be delivered online and will be also offered to members of the NETLAS network. First workshop will be led by Dr. Mike Hughes from the AOG and will focus on building and maintaining complex architectures in LabVIEW and is scheduled to start in September 2021. More details about the date of the 1st workshop will be communicated in the next Newsletter.





AOG and NETLAS PhD students support European football!

It's not coming home! The Euro 2020/2021 came to an end with the victory of Italy after an ultimate penalty shootout. Throughout the competition, students from the AOG and NETLAS gathered at home or in pubs to support their teams: Spain, Czech Republic, France, Wales, Finland, and finally England in the electric atmosphere of the streets of London on Sunday 11th July, day of the final. After a long struggle to find a pub to watch the match, they finally found a seat outside one of them and even managed to get a direct angle on a TV screen through the window (1st photo on second row!)



***Photos: Adrián Fernández Uceda, Julien Camard and NETLAS PhD
Student Alejandro Martinez***





Streets of London on Sunday 11th July - Euro 2021 Final



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.



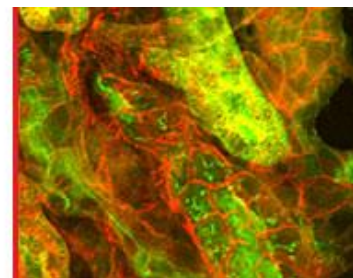
Coming Soon! Advanced Imaging Techniques for Laser Scanning Systems

The fifth installment of our *How to Build a Microscope* series will discuss advanced imaging techniques that can be used to enhance laser scanning microscopy.



Presented by Jeff Brooker, Life Science CTO, and Brian Mehl, Sr. Systems Engineer, Thorlabs Imaging Research Group

Click to Register!



Composite Two-Photon Image of Mouse Kidney



Coming Soon! Understanding and Using Single Mode Fiber

In this webinar, Dave will discuss how single mode fibers operate and offer practical tips for working with this type of fiber, including alignment, launching, mode filtering, and power handling.



**Presented by Dave Gardner,
Senior Process Engineer,
Thorlabs Advanced Photonics**

[Click to Register!](#)



Cross-Section of Single Mode Fiber



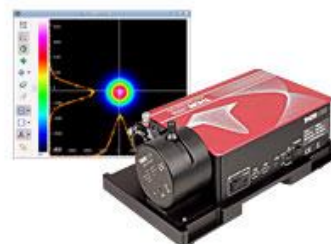
Coming Soon! Profiling Beam Shape and Waist Laser Science

The third installment of our light characterization series will discuss how to measure key parameters of a beam, how the M^2 factor is related to beam quality, and what methods can be used to characterize beams.



**Presented by Manfred
Gonnert, Team Leader, Light
Detection and Analysis**

[Click to Register!](#)



**Thorlabs Beam Profiler with
 M^2 Measurement Extension Set**



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