



## NETLAS NEWSLETTER 9-2021

### Last newsletter of 2021

NETLAS COORDINATOR Prof. Adrian Podoleanu

Last newsletter of 2021

What a year I said last year!

However, this year end does not look much different.

However, there is a difference, and this is on the positive, we have managed to recruit fantastic fellows on all 15 positions, the 15<sup>th</sup> declaration planted on the portal on 28 October 2021, ie with 9 months delay. The delays were due to consulates not open for many months.

With this important milestone, which is Number 3 on the portal, we are facing a bright new year in 2022. Looking forward for all of us to meet in person beginning of March at DTU. Several secondments are already planned.

On this positive note, please enjoy the attached Greeting Card drawn by Maria (6y and a half), Ramona's daughter.

A Happy New Year and let us make NETLAS successful!





## **Science meetings**

NETLAS PhD Student Alejandro Martinez and other members of the AOG team took the initiative to organize Science Meetings.

The idea is for the ESRs to present their work in a few slides starting with the background of their research, results they have obtained in the lab, and discuss problems and possible solutions. They plan to meet every two weeks on Friday mornings, 1st meeting took place on 26<sup>th</sup> November followed by a 2<sup>nd</sup> one on 10<sup>th</sup> December 10 am UK time. Next meeting is going to be scheduled for mid of January 2022.

Alejandro Martinez said: “I didn’t expect to have almost all of NETLAS students participating at the 1<sup>st</sup> meeting and that was a nice surprise. I felt like this kind of meeting was productive for almost all of us”.

The students have full support from other AOG members and NETLAS Coordinator Prof. Adrian Podoleanu who said: “Communication is everything; This exercise determines you to make graphs and document the results you obtained in the lab; This also allows you to exercise how to quickly and directly explain a concept to people who although technically minded, are not familiar with your project; The next even more difficult step would be to explain it to someone non technically minded, example would be, to a child”!

A few print screens from the 2<sup>nd</sup> meeting are presented below.



Science meeting - Friday 10th at 10:00am

01:04:57

SHOW TASKBAR DISPLAY SETTINGS END SLIDE SHOW

0:00:03 12:05 PM

## Meeting with PhDs

10-12-2021

*Data processing, writing and patient fiber coupling: my PhD life*

University of Kent NetLaS NKT Photonics

Slide 1 of 14

Next slide

Fast SS OCT

No Notes.

AJ +4

RC

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Science meeting - Friday 10th at 10:00am

10:30

## 1310 nm MEMS VCSEL for OCT

DTU

Objectives:

1. Develop Optically pumped MEMS VCSEL devices with a bandwidth larger than 150 nm at 1310 nm.
2. Assemble a SS-OCT system for NDT using the VCSEL source.

1310 nm 980 nm

Laser anode

Laser cathode and MEMS contact

(a) Optical Pumping (e) Electrical Pumping

- Poly-Si
- QWs
- TiO<sub>2</sub>
- Tunnel Junction
- Proton Implanted
- Metal Contact
- InP
- SiO<sub>2</sub>
- Si

10 December 2021 DTU Patrick

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Science meeting - Friday 10th at 10:00am

46:30

Developing Strong Research Questions

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Home Knowledge Base Starting the research process Developing strong research questions

Search...

### Research process

Starting your research

- Choose your topic
- Define your problem
- Research questions
- Research proposal

### Interesting topics

Research paper

### Developing strong research questions

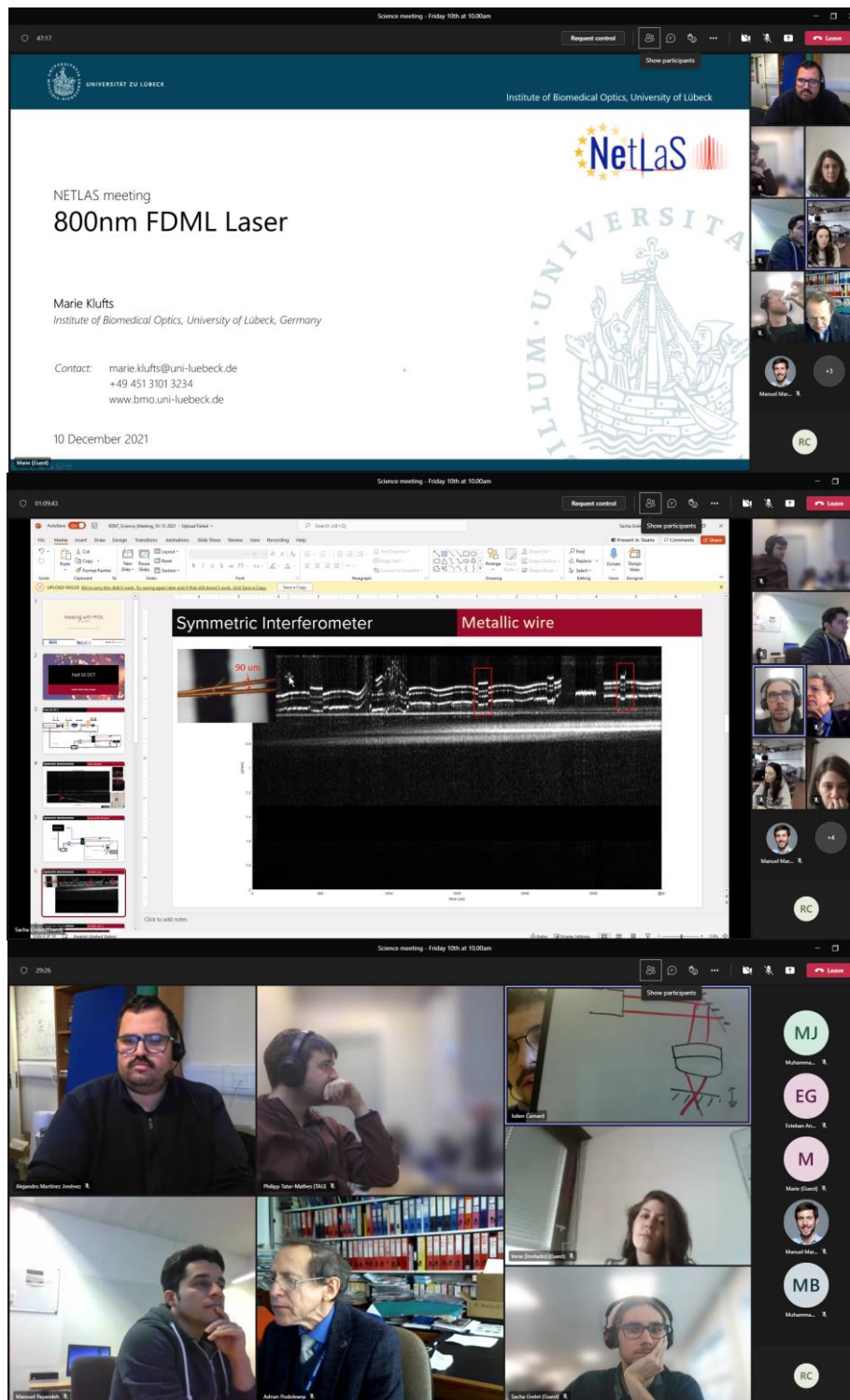
Published on April 16, 2019 by Shona McCombes. Revised on March 22, 2021.

A good research question is essential to guide your research paper, project or thesis. It pinpoints exactly what you want to find out and gives your work a clear focus and purpose. All research questions should be:

- ✓ **Focused** on a single problem or issue
- ✓ **Researchable** using primary and/or secondary sources
- ✓ **Feasible** to answer within the timeframe and practical constraints
- ✓ **Specific** enough to answer thoroughly
- ✓ **Complex** enough to develop the answer over the space of a paper or thesis
- ✓ **Relevant** to your field of study and/or society more broadly

I +5

RC





## CONFERENCES

### 1st International Conference Advances in 3OM: Opto-Mechatronics, Opto - Mechanics and Optical Metrology

The Conference was held in the beautiful city of [Timisoara – 2021](#)  
[European Capital of Culture](#), in the Western part of Romania,  
honouring 2021 International Day of Light (IDL) and celebrating 100 years  
of the Polytechnic University of Timisoara.



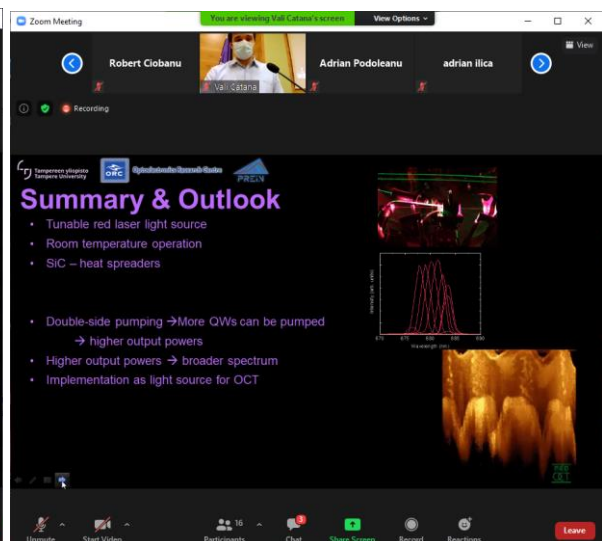
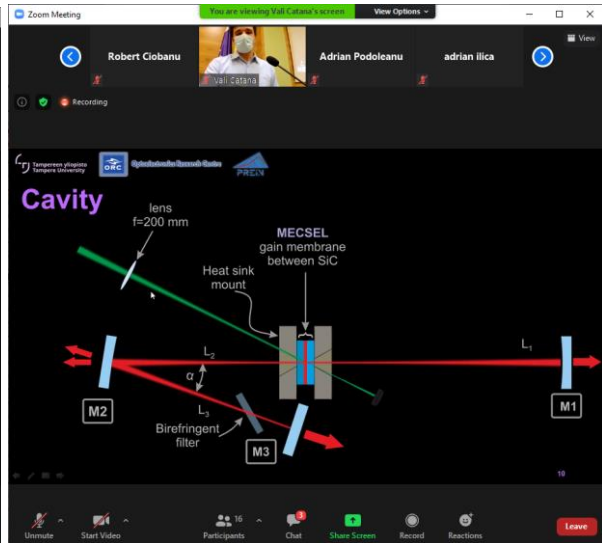
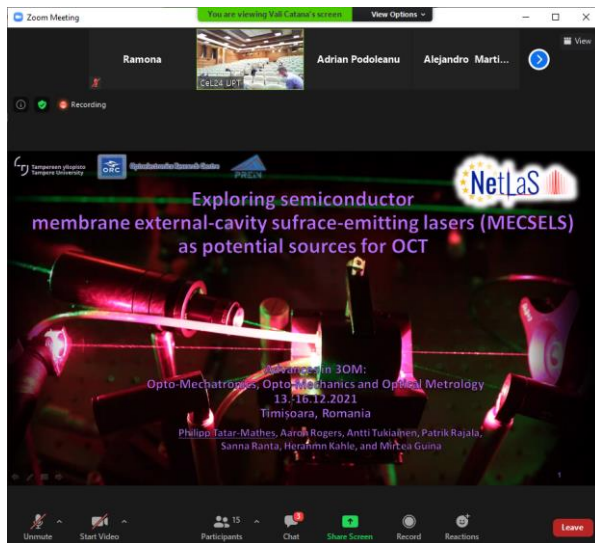
## CONFERENCE PROGRAM

The Framework of the Conference Program can be found [here](#).

The detailed Conference Program can be found [here](#).



NETLAS PhD Student Philipp Tatar-Mathes, currently hosted by Tampere University in Finland, attended the conference in person with an oral presentation “**Exploring MECSELS as potential sources for OCT**” (Paper 3OM100-10). Print screens of Phillipp’s presentation are presented below.





**Other presentations from the NETLAS teams  
to 1st International Conference Advances in 3OM:  
Opto-Mechatronics, Opto - Mechanics and Optical  
Metrology**

**Monday**

**13<sup>th</sup> December 2021**

Paper 3OM100-53

9<sup>30</sup> - 10<sup>30</sup>: **Optical coherence tomography (OCT)** (Plenary Presentation)

Author: **Adrian Podoleanu**, University of Kent (United Kingdom)

Paper 3OM100-53

11<sup>40</sup> - 12<sup>20</sup>: **Progress towards designs for customizable swept sources operating in multiple wavebands for coherence imaging** (Keynote Presentation)

Author: **George M. Dobre**, University of Kent (United Kingdom)

Paper 3OM100-

16<sup>40</sup> - 17<sup>20</sup>: **Combining Photoacoustic and Optical Coherence Tomography Imaging for Non-destructive testing applications** (Keynote Presentation)

Author: **Adrian Bradu**, University of Kent (United Kingdom)

**Tuesday**

**14<sup>th</sup> December 2021**

Paper 3OM100-66

11<sup>00</sup> - 12<sup>00</sup>: **Frontiers in the development of semiconductor lasers: new technologies and applications** (Plenary Presentation)

Author: **Mircea Guina**, Tampere University (Finland)

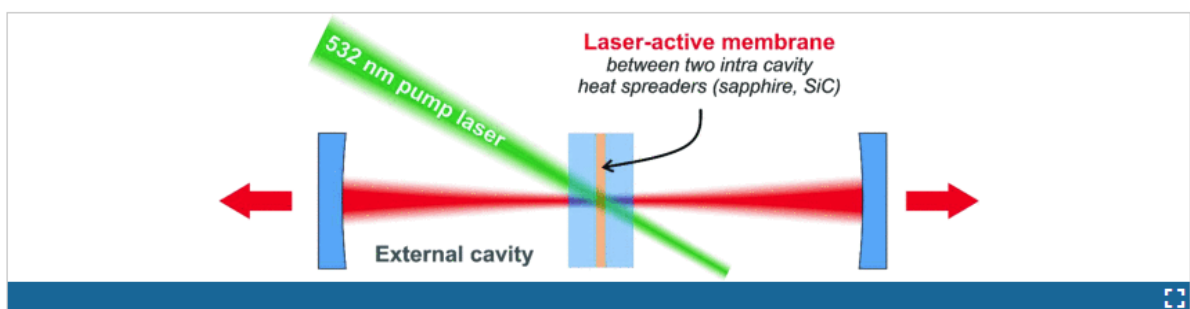
## PUBLICATIONS

### Thermal management analysis of a membrane external-cavity surface-emitting laser (MECSEL)

Hoy-My Phung; **Philipp Tatar-Mathes**; Aaron Rogers; Patrik Rajala; Sanna Ranta; **Hermann Kahle**; **Mircea Guina**

Published in: [2021 27th International Semiconductor Laser Conference \(ISLC\)](#)

DOI: [10.1109/ISLC51662.2021.9615757](#)



**Fig. 1.** Schematic drawing of the MECSEL with a linear cavity. Double-side cooling with two transparent intra cavity heat spreaders made of SiC or sapphire enables a more efficient, symmetric cooling of the laser-active membrane.

### Thermal management analysis of a membrane external-cavity surface-emitting laser (MECSEL)

Publisher: IEEE

[Cite This](#)

[PDF](#)

Hoy-My Phung; **Philipp Tatar-Mathes**; Aaron Rogers; Patrik Rajala; Sanna Ranta; **Hermann Kahle**; **Mircea Guina**; [All Authors](#)



<b>Abstract</b>	<b>Abstract:</b> A thermal management analysis based on the finite-element method is presented for an 800 nm-emitting MECSEL. The heat flow is examined for two different types of intra cavity heat spreaders, sapphire and silicon carbide (SiC) with varying heat spreader thicknesses.	
Document Sections	<b>Published in:</b> 2021 27th International Semiconductor Laser Conference (ISLC)	
I. Introduction	<b>Date of Conference:</b> 10-14 Oct. 2021	<b>DOI:</b> 10.1109/ISLC51662.2021.9615757
II. Results	<b>Date Added to IEEE Xplore:</b> 26 November 2021	<b>Publisher:</b> IEEE
Authors	<b>► ISBN Information:</b>	<b>Conference Location:</b> Potsdam, Germany
Figures	<b>► ISSN Information:</b>	
References		
Keywords		

## Resonant and off-resonant designs of membrane external-cavity surface-emitting lasers emitting at 800 nm

Philipp Tatar-Mathes; Hoy-My Phung; Aaron Rogers; Patrik Rajala; Sanna Ranta; **Hermann Kahle**; **Mircea Guina**

Published in: [2021 27th International Semiconductor Laser Conference \(ISLC\)](#)

DOI: [10.1109/ISLC51662.2021.9615818](https://doi.org/10.1109/ISLC51662.2021.9615818)

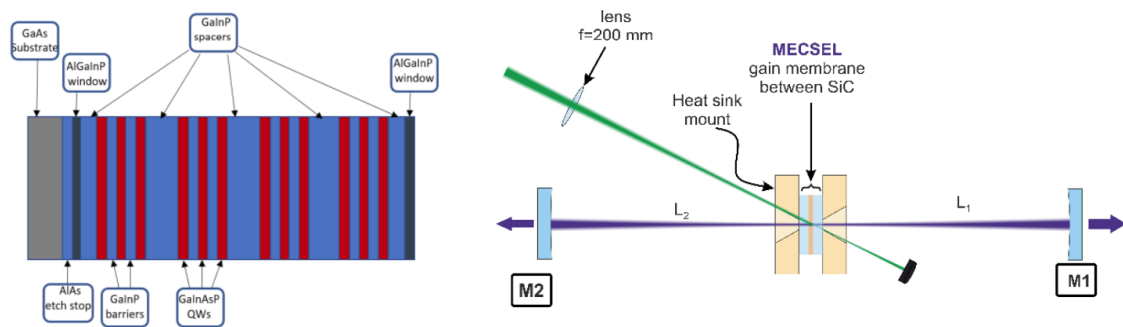


Fig. 1. Left: Schematic illustration of the structural design. Both active regions consist of 4x3 GaInAsP QWs that are embedded and spaced in GaInP barriers and spacers, respectively. The investigated structures differ in the thickness of the outermost spacer layers. Right: Schematic illustration of the linear cavity. M2 is HR ( $R=99.8\%$ ),  $r=200$  mm, M1 is  $R=97\%$ ,  $r=75$  mm. The distances are  $L_1=73$  mm,  $L_2=198$  mm.

### Resonant and off-resonant designs of membrane external-cavity surface-emitting lasers emitting at 800 nm

Publisher: IEEE

[Cite This](#)

[PDF](#)

[Philipp Tatar-Mathes](#); [Hoy-My Phung](#); [Aaron Rogers](#); [Patrik Rajala](#); [Sanna Ranta](#); [Hermann Kahle](#); [Mircea Guina](#); [All Authors](#)

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#### Abstract

##### Document Sections

I. Introduction

II. Results

[Authors](#)

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[Keywords](#)

#### Abstract:

We present our latest results of two MECSELS emitting around 800 nm for the investigation on the impact of the outermost spacing layer thickness to overall performance of the device under same conditions. The structures both consist of GaInAsP quantum wells embedded in GaInP spacers.

Published in: 2021 27th International Semiconductor Laser Conference (ISLC)

Date of Conference: 10-14 Oct. 2021

Date Added to IEEE Xplore: 26 November 2021

► ISBN Information:

► ISSN Information:

DOI: [10.1109/ISLC51662.2021.9615818](https://doi.org/10.1109/ISLC51662.2021.9615818)

Publisher: IEEE

Conference Location: Potsdam, Germany



## Membrane external-cavity surface-emitting lasers for high power broadband emission in the 1 $\mu\text{m}$ range

Hermann Kahle; Hoy-My Phung; Philipp Tatar-Mathes; Patrik Rajala; Mircea Guina

Published in: [2021 27th International Semiconductor Laser Conference \(ISLC\)](#)

DOI: [10.1109/ISLC51662.2021.9615904](#)

### Abstract:

A membrane external-cavity surface-emitting laser (MECSEL) with a gain element consisting of an intra-cavity heat spreader sandwiched InGaAs quantum well structure is presented. The quantum well structure is optimized for high-power ( $> 100 \text{ mW}$ ) continuous wave broadband tunability of more than 25 THz.

### Membrane external-cavity surface-emitting lasers for high power broadband emission in the 1 $\mu\text{m}$ range

Publisher: IEEE

[Cite This](#)



[PDF](#)

[Hermann Kahle](#) [Hoy-My Phung](#) [Philipp Tatar-Mathes](#) [Patrik Rajala](#) [Mircea Guina](#) [All Authors](#)



<b>Abstract</b>	<b>Abstract:</b> A membrane external-cavity surface-emitting laser (MECSEL) with a gain element consisting of an intra-cavity heat spreader sandwiched InGaAs quantum well structure is presented. The quantum well structure is optimized for high-power ( $> 100 \text{ mW}$ ) continuous wave broadband tunability of more than 25 THz.	
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I. Introduction		
II. Results		
Authors	<b>Date of Conference:</b> 10-14 Oct. 2021	<b>DOI:</b> 10.1109/ISLC51662.2021.9615904
Figures	<b>Date Added to IEEE Xplore:</b> 26 November 2021	<b>Publisher:</b> IEEE
References	<b>► ISBN Information:</b>	<b>Conference Location:</b> Potsdam, Germany
Keywords	<b>► ISSN Information:</b>	



## Comparison of electrically and optically pumped buried-heterostructure photonic crystal lasers

Evangelos Dimopoulos, Yi Yu, Aurimas Sakanas, Andrey Marchevsky, Meng Xiong, Kristoffer S. Mathiesen, Elizaveta Semenova, **Kresten Yvind**, and Jesper Mørk


2021 Conference on Lasers and Electro-Optics Europe and European Quantum Electronics Conference

[OSA Technical Digest \(Optical Society of America, 2021\)](#)

Conferences > CLEO\_Europe > 2021 > cb\_1 > cb\_1\_2

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2021 Conference on Lasers and Electro-Optics Europe and European Quantum Electronics Conference OSA Technical Digest (Optical Society of America, 2021), paper cb\_1\_2



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Evangelos Dimopoulos, Yi Yu, Aurimas Sakanas, Andrey Marchevsky, Meng Xiong, Kristoffer S. Mathiesen, Elizaveta Semenova, **Kresten Yvind**, and Jesper Mørk

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**PDF Article**

**Abstract**

The properties of buried-heterostructure photonic crystal nanolasers are studied by employing electrical and optical pumping. Using the rate equations and the spectral evolution of the laser the thermal properties and injection efficiency are being investigated.

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**The European Conference on Lasers and Electro-Optics 2021**  
Munich Germany  
21–25 June 2021  
ISBN: 978-1-6654-1876-8

From the session  
[Photonic Crystal and Membrane Lasers \(cb\\_1\)](#)

**Related Topics**

- [Optics & Photonics Topics](#)
- [Nanolasers](#)
- [Optical interconnects](#)
- [Optical pumping](#)



## 2- $\mu\text{m}$ -band Coherent Transmission of Nyquist-WDM 16-QAM Signal by On-chip Spectral Translation

D. Kong, Y. Liu, Z. Ren, Y. Jung, C. Kim, Y. Chen, N. Wheeler, M. Pu, **K. Yvind**, M. Galili, L. Oxenløwe, D. Richardson, and H. Hu,

Conference on Lasers and Electro-Optics, Technical Digest (Optical Society of America, 2021), paper SF1C.1.

Published in: [2021 Conference on Lasers and Electro-Optics \(CLEO\)](#)

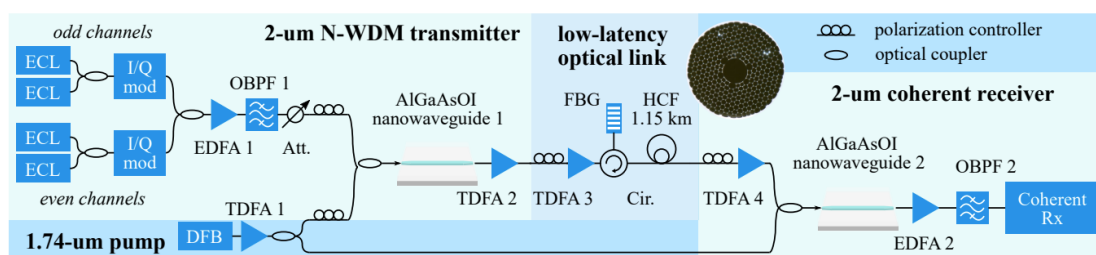


Fig. 1: Experiment setup. (ECL: external cavity laser; EDFA: erbium-doped fibre amplifier; Att.: attenuator, Cir.: circulator; DFB: distributed feedback laser.)

Conferences > 2021 Conference on Lasers and Electro-Optics

### 2- $\mu\text{m}$ -band Coherent Transmission of Nyquist-WDM 16-QAM Signal by On-chip Spectral Translation

Publisher: IEEE

[Cite This](#)

[PDF](#)

Deming Kong ; Yong Liu ; Zhengqi Ren ; Yongmin Jung ; Chanju Kim ; Yong Chen ; Natalie Wheeler ; Minhao Pu ; **Kresten Yvind** ; Michael Galili ; Leif K Oxenløwe ; David J Richardson ; ... [All Authors](#)



#### Abstract

#### Authors

#### Figures

#### References

#### Keywords

#### Abstract:

We propose and demonstrate the first low-latency 2- $\mu\text{m}$ -band coherent N-WDM transmission by on-chip spectral translation of 4 $\times$ 32-Gbaud 16-QAM signals with 33-GHz spacing. 318.25 Gbit/s net-rate is achieved with error-free performance after 1.15km hollow-core fiber transmission.

Published in: [2021 Conference on Lasers and Electro-Optics \(CLEO\)](#)

Date of Conference: 9-14 May 2021

Publisher: IEEE

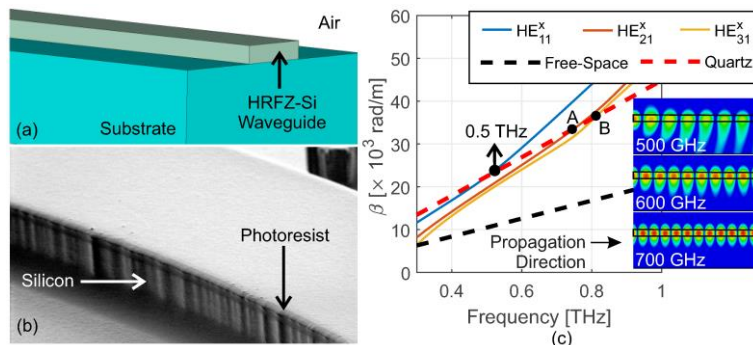
Date Added to IEEE Xplore: 29 October 2021

Conference Location: San Jose, CA, USA

► ISBN Information:

Print on Demand(PoD) ISSN: 2160-8989

## Broadband Terahertz Photonic Integrated Circuit with Integrated Active Photonic Devices



**Figure 1.** (a) Topology of the designed dielectric waveguides. (b) Microscopic image of an etched waveguide. The photoresist mask is visible on top of the waveguides. Side-wall irregularities are caused due to the pixelated nature of the lithographic mask. (c) Simulated values of the propagation constant ( $\beta$ ) of the first 3 modes.

Amlan Kusum Mukherjee, Mingjun Xiang, **Sascha Preu**

*Photonics* **2021**, *8*(11), 492; <https://doi.org/10.3390/photonics8110492>

Open Access Article

## Broadband Terahertz Photonic Integrated Circuit with Integrated Active Photonic Devices

by  Amlan Kusum Mukherjee ,  Mingjun Xiang  and  Sascha Preu 

Department of Electrical Engineering and Information Technology, Technical University of Darmstadt, Merckstr. 25, 64283 Darmstadt, Germany

\* Author to whom correspondence should be addressed.

*Photonics* **2021**, *8*(11), 492; <https://doi.org/10.3390/photonics8110492>

Received: 29 September 2021 / Revised: 28 October 2021 / Accepted: 1 November 2021 / Published: 3 November 2021

(This article belongs to the Special Issue Frontiers in Terahertz Technology and Applications)

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### Abstract

Present-day photonic terahertz (100 GHz–10 THz) systems offer dynamic ranges beyond 100 dB and frequency coverage beyond 4 THz. They yet predominantly employ free-space Terahertz propagation, lacking integration depth and miniaturisation capabilities without sacrificing their extreme frequency coverage. In this work, we present a high resistivity silicon-on-insulator-based multimodal waveguide topology including active components (e.g., THz receivers) as well as passive components (couplers/splitters, bends, resonators) investigated over a frequency range of 0.5–1.6 THz. The waveguides have a single mode bandwidth between 0.5–0.75 THz; however, above 1 THz, these waveguides can be operated in the overmoded regime offering lower loss than commonly implemented hollow metal waveguides, operated in the fundamental mode. Supported by quartz and polyethylene substrates, the platform for Terahertz photonic integrated circuits (Tera-PICs) is mechanically stable and easily integrable. Additionally, we demonstrate several key components for Tera-PICs: low loss bends with radii  $\sim 2$  mm, a Vivaldi antenna-based efficient near-field coupling to active devices, a 3-dB splitter and a filter based on a whispering gallery mode resonator. [View Full-Text](#)

# ADVANCED OCT ANALYSIS OF BIOPSY PROVEN VITREORETINAL LYMPHOMA: OCT findings in vitreo-retinal lymphoma

Francesco Pichi<sup>1, 2</sup>, Rosa Dolz-Marco<sup>3</sup>, Jasmine H Francis<sup>4, 5</sup>, Adrian Au<sup>6</sup>, Janet L Davis<sup>7</sup>, Amani Fawzi<sup>8</sup>, Sarra Gattousi<sup>9, 10</sup>, Debra A Goldstein<sup>11</sup>, **Pearse A Keane**<sup>12</sup>, Elisabetta Miserocchi<sup>12</sup>, Alessandro Marchese<sup>13</sup>, Kyoko Ohno-Matsui<sup>13</sup>, Mandeep S Sagoo<sup>11, 14</sup>, Scott D Smith<sup>1, 2</sup>, Ethan K Sobol<sup>4, 5</sup>, Anastasia Tasiopoulou<sup>11</sup>, Xialou Yang<sup>15</sup>, Carol L Shields MD<sup>15</sup> ... David Sarraf<sup>6, 18</sup>

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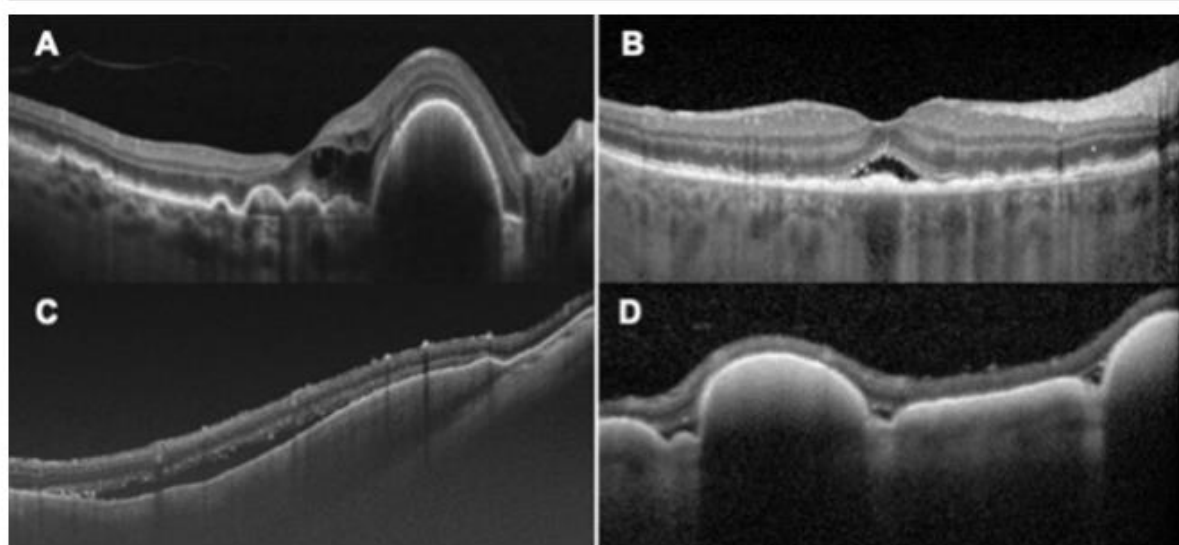


Figure 4. Optical coherence tomography (OCT) showing intraretinal and subretinal fluid in cases of vitreo-retinal lymphoma.



## Endoscopic en-face optical coherence tomography and fluorescence imaging using correlation-based probe tracking

**Manuel J. Marques, Michael R. Hughes, Adrián F. Uceda, Grigory Gelikonov, Adrian Bradu, Adrian Podoleanu**

Forward-viewing endoscopic optical coherence tomography (OCT) provides 3D imaging in vivo, and can be combined with widefield fluorescence imaging by use of a double-clad fiber. However, it is technically challenging to build a high-performance miniaturized 2D scanning system with a large field-of-view. In this paper we demonstrate how a 1D scanning probe, which produces cross-sectional OCT images (B-scans) and 1D fluorescence T-scans, can be transformed into a 2D scanning probe by manual scanning along the second axis. OCT volumes are assembled from the B-scans using speckle decorrelation measurements to estimate the out-of-plane motion along the manual scan direction. Motion within the plane of the B-scans is corrected using image registration by normalized cross correlation. En-face OCT slices and fluorescence images, corrected for probe motion in 3D, can be displayed in real-time during the scan. For a B-scan frame rate of 250 Hz, and an OCT lateral resolution of approximately 20 micrometers, the approach can handle out-of-plane motion at speeds of up to 4 mm/s.

[Cite: arXiv:2110.09450](https://arxiv.org/abs/2110.09450)

arXiv.org > physics > arXiv:2110.09450

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Physics > Optics

(Submitted on 18 Oct 2021)

**Endoscopic en-face optical coherence tomography and fluorescence imaging using correlation-based probe tracking**

Manuel J. Marques, Michael R. Hughes, Adrián F. Uceda, Grigory Gelikonov, Adrian Bradu, Adrian Podoleanu

Forward-viewing endoscopic optical coherence tomography (OCT) provides 3D imaging in vivo, and can be combined with widefield fluorescence imaging by use of a double-clad fiber. However, it is technically challenging to build a high-performance miniaturized 2D scanning system with a large field-of-view. In this paper we demonstrate how a 1D scanning probe, which produces cross-sectional OCT images (B-scans) and 1D fluorescence T-scans, can be transformed into a 2D scanning probe by manual scanning along the second axis. OCT volumes are assembled from the B-scans using speckle decorrelation measurements to estimate the out-of-plane motion along the manual scan direction. Motion within the plane of the B-scans is corrected using image registration by normalized cross correlation. En-face OCT slices and fluorescence images, corrected for probe motion in 3D, can be displayed in real-time during the scan. For a B-scan frame rate of 250 Hz, and an OCT lateral resolution of approximately 20 micrometers, the approach can handle out-of-plane motion at speeds of up to 4 mm/s.

Comments: 16 pages

Subjects: Optics (physics.optics), Medical Physics (physics.med-ph)

Cite as: arXiv:2110.09450 [physics.optics]  
(or arXiv:2110.09450v1 [physics.optics] for this version)

Submission history

From: Michael Hughes [view email]

[v1] Mon, 18 Oct 2021 16:39:38 UTC (14,968 KB)



## **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 started a series of informal internally run workshops on various topics such as software training (LabVIEW, ImageJ, Blender) and 3D printer use.

First workshop took place in October 2021 and was presented by Dr. Manuel Marques about 3-D modelling and printing. Its recorded version can be found on the following link:

[AOG workshop - 3D modelling & printing by Dr Manuel Marques - YouTube](#)

We hope this will be useful for all of you, as it will minimize the need for time-consuming and expensive workshop hours.





## **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](#).

## **Miscellaneous**

### **University of Kent alumnus and emeritus Professor Abdulrazak Gurnah wins Nobel Prize for Literature 2021**

The Nobel Committee awarded this year's Prize to Professor Gurnah for 'his uncompromising and compassionate penetration of the effects of colonialism and the fate of the refugee in the gulf between cultures and continents.'

Kent alumnus and emeritus professor Abdulrazak Gurnah was presented with his Nobel Prize for Literature medal and diploma by Swedish Ambassador Mikaela Kumlin Granit on Monday 6 December 2021. The presentation took place during a special ceremony at the Ambassador's Residence in London. A video of the presentation is available [here](#).

[This story](#) was originally published on 7 October 2021.



## Fun in spare time

### Dr Manuel Marques AOG:

I saw this challenge on science twitter account where I generated artwork following the website <https://app.wombo.art> by putting a research topic as a title. Here's what OCT looks like. One could mistake this for a particularly beautiful OCT-A image...

**PhD Student Sacha Grelet:** This creates beautiful images! Let me introduce to you the supercontinuum. Here I can recognize the spectrogram, after supercontinuum generation ^^





## AOG Christmas celebration

AOG has the tradition of gathering together every year to celebrate Christmas. This year was again challenging due to pandemic, but the team managed to find a local cosy pub with the top floor reserved to the AOG only. Like every year, the celebration ended with the traditional speech of the head of the group, Prof. Adrian Podoleanu, who highlighted the achievements of the year 2021.



*Merry Christmas from AOG*



**AOG wishes everyone Merry Christmas &  
Happy New Year!**



Night view of the  
Canterbury Cathedral  
November 2021



NETLAS PhD Student  
Alejandro Martines: Rudolph the  
Red-Nosed Reindeer  
([Enjoy Motion film from 1964](#))



AOG Christmas celebration: part of the students' corner



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## 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)