NETLAS NEWSLETTER 8-2022

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

Organizers are preparing the event and more details will follow soon.

SECONDMENTS

PhD7: Irene Rodriguez Lamoso

Host: **Technical University of Darmstadt** (TUDa)

Secondment started 1st of April 2022 at
University of Kent, **Applied Optics Group (AOG)** for four months

PhD Project: Large tuning range lasers based on FP-MEMS and MEMS-VCSEL for OCT applications

Two weeks have already passed since I came back from my secondment at the University of Kent, which was prepared for months in advance. Sending all my equipment to Canterbury was a really hard job that I could not have managed without my excellent colleagues from TU Darmstadt. My colleagues from Kent helped me with the housing (Alejandro, René, Julien - thank you All) and after a couple of weeks getting to know the Applied Optics Group (AOG) my boxes arrived and we were ready to work 100% equipped. (*ADVICE*: make sure you have the ATA carnet when you get your equipment). While we were starting the research, all these difficulties achieving our goals appeared as well. It was an amazing experience being able to work with my colleagues from NETLAS and the AOG. It was very fruitful sharing, helping and learning from each other. (Fig.1.).

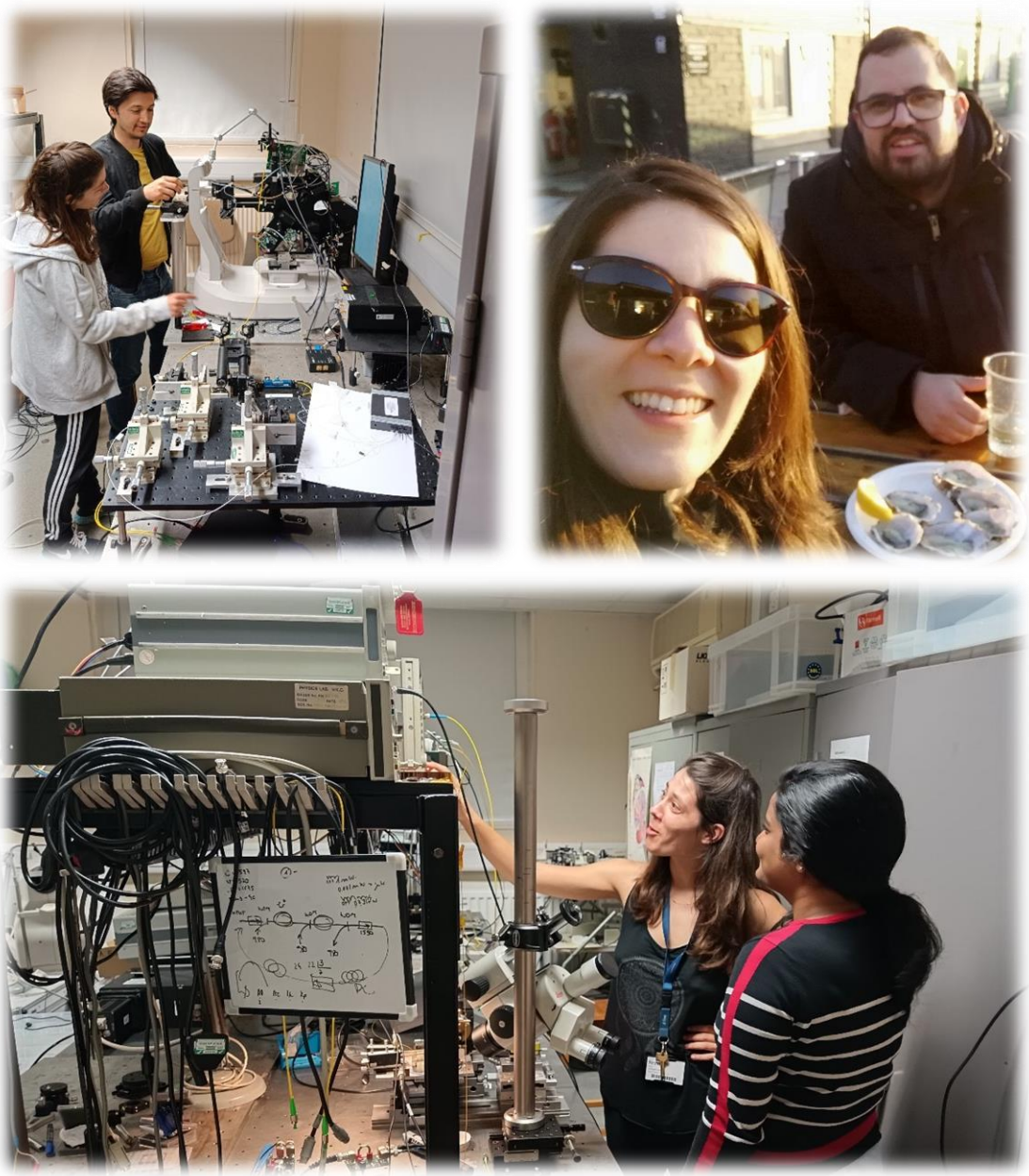


Fig. 1. Top left Esteban and me working on Esteban's set-up. Top right Alejandro and me having oysters. Bottom Gopika and me pretending to work on my set-up to take a picture.

At the same time as we were advancing on the research, I had the opportunity to discover Canterbury, which is a lovely city full of interesting places (Fig.2.). During my secondment another two students from the Technical University of Denmark (DTU) were doing their secondment in the AOG too, Esteban, from NETLAS, and Rasmus. The three of us started playing Gaelic football together with other members of the AOG (*RECOMMENDATION*: This is an essential activity if you do your secondment in Kent). I also participated in the Salsa Society (*RECOMMENDATION*: If you like dancing this is the second essential).

Fig 2. On the left photo is the bridge that crosses the canal close to the Marlowe Theatre, really beautiful spot, my favourite in the city. On the right is a bookshop in the city centre.

Another important event was Prof. Adrian Podoleanu's Career Celebration, where scientists from all over the world, including some ESR from NETLAS came to celebrate the work of Adrian in OCT during all these years. It was a very interesting and motivational event where the PhD students participated with our posters. (Fig. 3.)

Fig. 3. Celebration of Adrian Podoleanu's Career. Picture taken by Julien Camard.

During this whole time we also did a lot of activities with the group: we had a picnic, we visited a company and we celebrated every birthday, welcome, farewell or just that it was Friday in Ye Old Beverly. (Fig. 4.)

Fig. 4. On the left AOG picnic on campus. On the right Esteban's farewell celebration.

I was working until the last day, taking results until the last minute. As it always happens when we solve a problem a new one appears, but that is the name of the game, *i´nit?*
Now that I am back in Darmstadt, Alejandro and me managed to send an abstract with part of the work that we did during my secondment to Photonics West. *Wish us luck!*
I have to say that England surprised me a lot this time even thought I spent two years of my life living there in the past. The cathedral is very impressive (*and free with the student card from the University of Kent*). A good way to know the city and lose yourself around is to search for the 7 fat trees of Canterbury (*their locations are on the internet*) (Fig. 5.). We did a hiking trip from Folkstone to Dover, it's just incredible. There are oyster stands near the beach. I also visited Maidstone a couple of times, that is such a beautiful city near Canterbury (Fig. 6.) (*ADVICE: with the RailCard you can get very nice discounts in train transport*).

Fig. 5. On the left visit to the Canterbury's cathedral with NETLAS ESR and other friends (left to right, Marie, Carla, Alejandro, Sacha and Esteban). On the right Rasmus and me searching for the seven trees (*we found two*).

Fig. 6. On the right view from hiking path from Folkestone to Dover. On the left a small town close to Maidstone.

I would like to say thank you to everybody that I met during this experience. It was such a wonderful time that would not be possible without all the people that were part of it. I am sure every one of you that will spend time in the AOG in the future would have similar words like me. Looking forward for Dresden conference in September and for the Autumn school in Darmstadt in October. I hope my experience helps some of you or that at least that you enjoyed reading it.

Fig. 7. On our left last day in Kent, Rasmus and me, celebrating in Ye Old Beverly. Picture taken by Ramona Cernat. On the right evolution of a potato over which Alejandro and Esteban did OCT and I adopted it after as a pet.

AOG Journal Club

Presentation by Dr Mike Hughes

Friday 05/08/2022 at 12 pm

Title of the talk: "*Computational approach to high resolution fibre-based endoscopic imaging".*

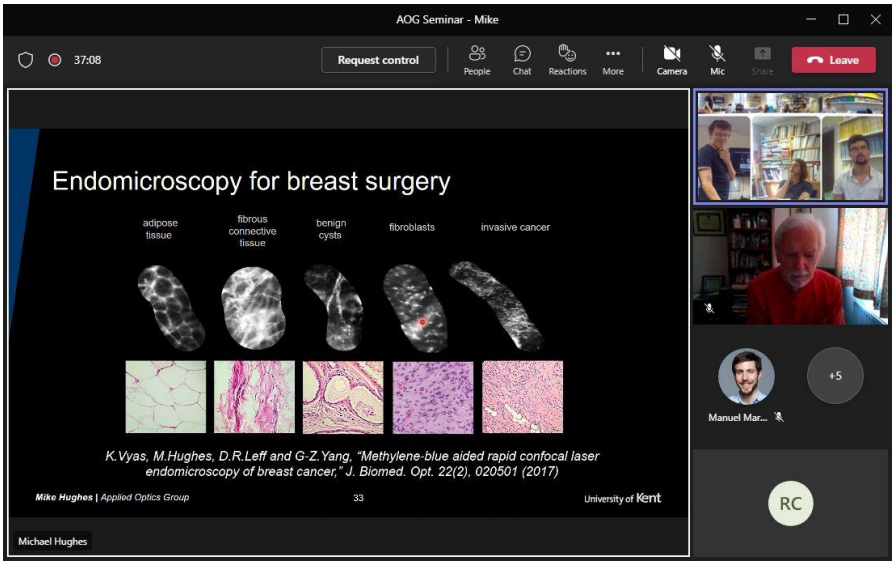
My lab develops high-resolution imaging technology for biomedical applications. We want to make microscopic imaging more accessible and practical in non-traditional settings such as point-of-care imaging. We aim to use computational imaging techniques to achieve performance similar to large and expensive bench-top microscopes, but in low-cost, small form-factor devices.

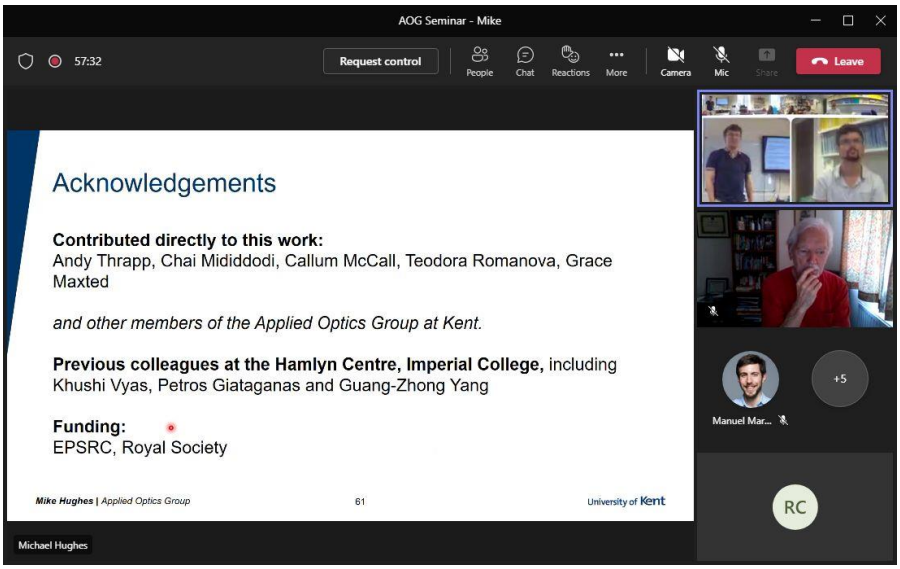
I mostly focus on endomicroscopy, a technique which allows us to image tissue in vivo at high resolution. I work on the development of new techniques for fibre bundle based endomicroscopes, with a focus on enhancing the resolution and optical strengthening power, and on making devices lower cost and more accessible. At Kent we have recently developed a new approach which allows a computational sectioning technique, structured illumination endomicroscopy, to be used with a moving probe [1, 2], and developed a technique for line-scanning endomicroscopy [3].

I also work on holographic imaging through fibre bundle. Holographic microscopy is a type of computational microscopy in which the phase of light can be recovered. This provides information about samples which are transparent, and so difficult to see by conventional microscopy, but also allows us to numerically refocus an image (a single image can be focused to any position we wish). We have recently developed a new method for building miniature holographic microscopes using fibre bundles [4], and with funding from the Royal Society we are now building prototypes and exploring applications.

A final strand of my work is to develop a fluorescence 'microscope in a needle'. To build a useful needle microscope, able to image deep inside tissue with minimal invasiveness, we need to make a high-resolution image conduit, which is less than a few hundred microns in diameter. With funding from EPSRC, we explored ways of transmitting images through single-core multimode fibres by exploiting interference between the fibre modes [5] and we are continuing to investigate how we can improve the speed and quality of the images obtained in this way.

A few slides from Mike's presentation are presented below:





A few slides from Dr. Mike Hughes's presentation

AOG rehearsal presentation for the ICO-25 Conference in Dresden (5-9 Sept 2022)

NETLAS PhD Student René Riha

19th August 2022 at 12 pm

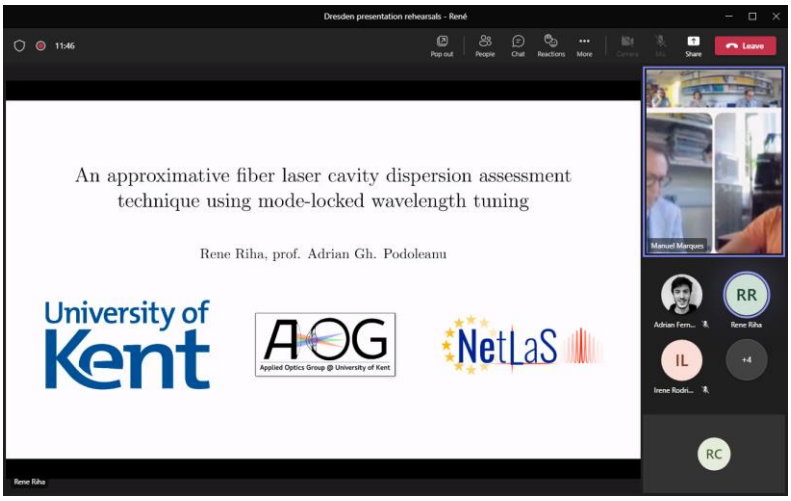
NETLAS PhD Student René Riha had a rehearsal of his talk "***An Approximate cavity dispersion assessment technique using dispersive mode-locked cavity wavelength tuning***" which is going to be presented at the conference ICO-25 (25th Congress of the International Commission for Optics) Friday 9th September 2022. René is also one co-author of his NETLAS colleague talk's Alejandro Martinez Jimenez.

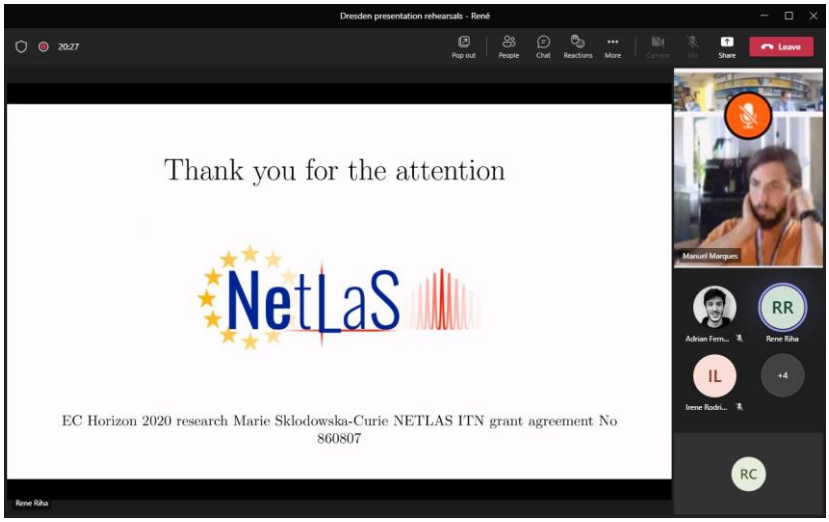
TS 13-7-02 – Measuring chromatic dispersion for fibre laser cavities on mode-locked lasers (#538)

A. Martinez Jimenez, R. Riha, A. Podoleanu
Session: TS 13-7 - Sensors and Cavities 1
Date: Friday, 9 September, 2022, 11:00 AM
Room: Room 304 (R7)

TS 13-7-04 – An approximative cavity dispersion assessment technique using dispersive mode-locked cavity wavelength tuning (#588)

R. Riha
Session: TS 13-7 - Sensors and Cavities 1
Date: Friday, 9 September, 2022, 11:45 AM
Room: Room 304 (R7)





A few slides from the [NETLAS PhD Student Rene Riha's] presentation rehearsal

AOG rehearsal presentation for the ICO-25 Conference in Dresden (5-9 Sept 2022)

NETLAS PhD Student Gopika Venugopal

26th August 2022 at 12 pm UK time

NETLAS PhD Student Gopika Venugopal had a rehearsal of her talk "***Development of a Swept Source based on galvo scanner filter in the wavelength range 850 nm***". A few slides are presented below.

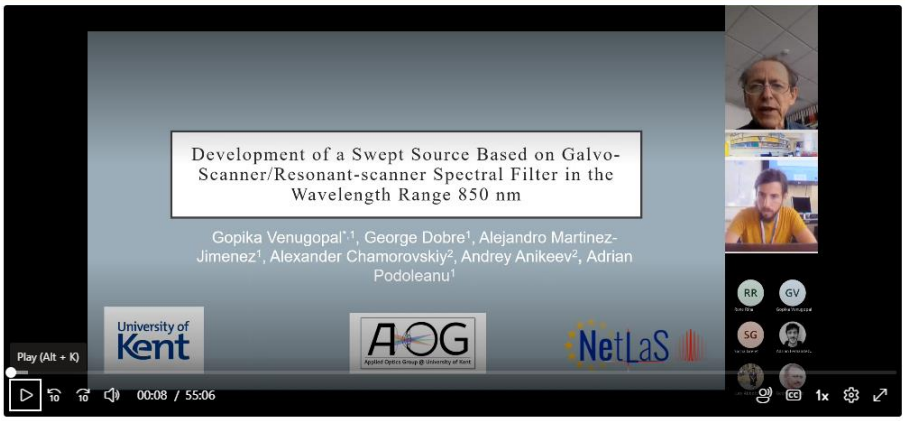
TS 8-6-03 – Development of a Swept Source based on galvo scanner spectral filter in the wavelength range 850 nm (#628)

G. Venugopal, G. Dobre, A. M. Jimenez, A. Chamorovskiy, A. Anikeev, A. Podoleanu

Session: TS 8-6 - Optical Coherence Tomography

Date: Thursday, 8 September, 2022, 10:00 AM

Room: Lecture Hall 3 (R6)



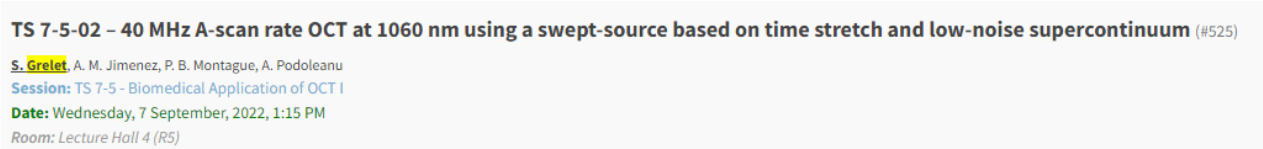
Slides from the NETLAS PhD Student Gopika Venugopal presentation rehearsal

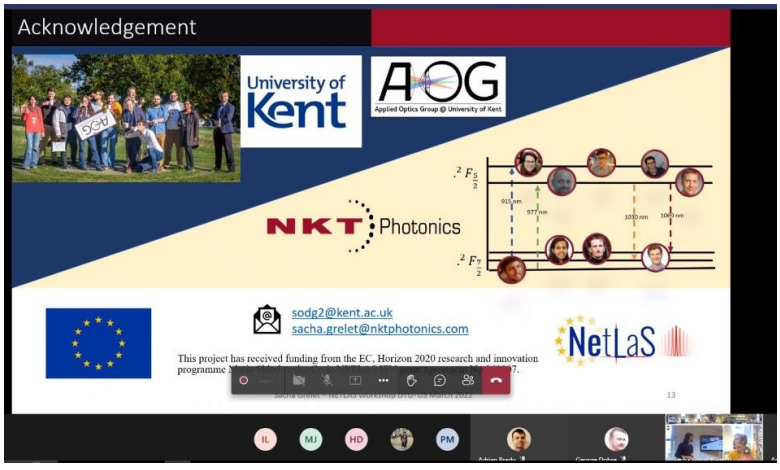
AOG rehearsal presentation for the ICO-25 Conference in Dresden (5-9 Sept 2022)

NETLAS PhD Student Sascha Grelet

30th August 2022 at 12 pm UK time

NETLAS PhD Student Sascha Grelet had the rehearsal of his talk "***40 MHz A-scan rate OCT at 1060 nm using a swept-source based on time stretch and low noise supercontinuum***". A few slides are presented below.





Slides from the NETLAS PhD Student Sascha Grelet presentation rehearsal

AOG rehearsal presentation for the ICO-25 Conference in Dresden (5-9 Sept 2022)

NETLAS PhD Student Alejandro Martinez Jimenez

1st September 2022 at 12 pm UK time

NETLAS PhD Student Alejandro Martinez Jimenez had a rehearsal of his talk "***Measuring chromatic dispersion for fiber laser cavities on mode-locked lasers***". A few slides are presented below.

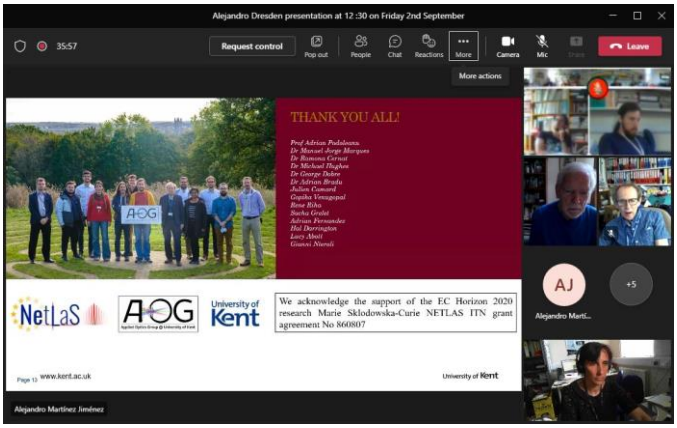
TS 13-7-02 – Measuring chromatic dispersion for fibre laser cavities on mode-locked lasers (#538)

A. Martinez Jimenez, R. Riha, A. Podoleanu

Session: TS 13-7 - Sensors and Cavities 1

Date: Friday, 9 September, 2022, 11:00 AM

Room: Room 304 (R7)



Slides from the NETLAS PhD Student Alejandro Martinez Jimenez presentation rehearsal

Institute of Ophthalmology Inaugural Lecture with Professor Pearse Keane (NETLAS Associated Partner)

27 July 2022, 5:00 pm–7:00 pm

Congratulation to our NETLAS Associated Partner Consultant at Moorfields Prof. Pearse Keane for the presentation with the title "***Artificial intelligence in ophthalmology – reinventing the eye exam***" with the occasion of his inaugural lecture as Professor of Artificial Medical Intelligence at UCL Institute of Ophthalmology, London, UK

Post from Twitter by

National Institute for Health and Care Research (NIHR) Moorfields **Biomedical Research Centre** (BRC)

PUBLICATIONS

900 kHz dual resonance akinetic dispersive cavity swept source using a cFBG and an intensity modulator

Rene Riha, Adrian Bradu, and Adrian Podoleanu

Optics Letters, July 2022, Doc. ID 463675

DOI:10.1364/OL.463675

Abstract: In this paper, a fast dual resonance akinetic optical swept source operating at 1550 nm is demonstrated. In-stead of modulating the optical amplifier gain reported in our previous studies, here we employ a fiber intensity modulator as a mode-locking element. A chirped fiber Bragg grating is used to provide sufficient dispersion in the laser cavity. A tuning range of 25 nm is obtained fora sweep frequency of ≈ 900 kHz with a 6 dB drop-off insensitivity at 2.6 mm optical path difference.

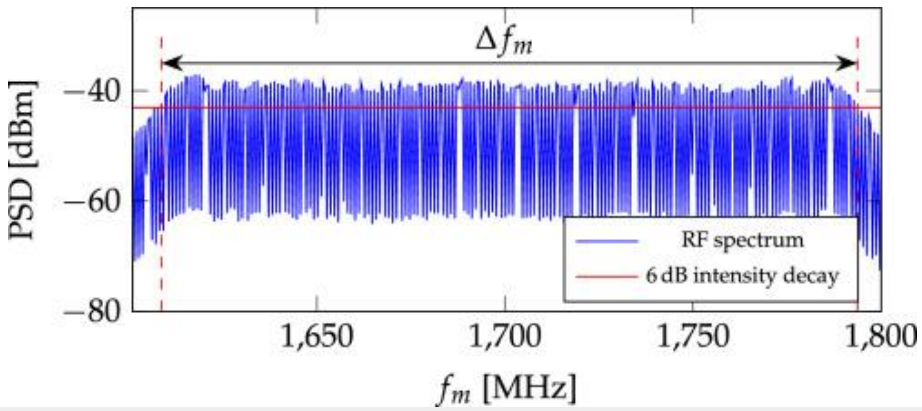


Fig. 3. Experimentally recorded RF spectrum at the output of the VCO swept at $fs0$=912kHzfs0=912kHz over Δfm≒185MHzΔfm≒185MHz giving a number of frequency components NRF≳200NRF≳200. PSD, power spectral density.

Niamh Brennan: 100 rules for publishing in top journals

A checklist for success.

Credit: University of College Dublin/Supplied

Niamb Brennan, is a professor of management at the University College Dublin in Ireland, who published "100 research rules of the game", which draws on her own experiences as an early-career researcher.

The paper, subtitled "**How to make your research world class; how to successfully publish in top international refereed journals**" published in the *Accounting, Auditing & Accountability Journal* in May 2019, is a checklist for researchers to consider before hitting 'send' on their manuscript.

Nature Index spoke to Brennan about the pitfalls researchers face when getting their work reviewed, and how to ensure the best chance of success. Read More

Find the PDF of the article here

(source **https://www.natureindex.com)**

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.

October 12 2022 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

Click to Register!

LIGO Laboratory Detects Gravitational Waves Using Interferometers

Kent University - Diamond Garden project- looking ahead to the University's 60th anniversary

Our beautiful, green and biodiverse environment is such a special feature of Kent University campuses. We are also ambitious for how we can develop this further in the future as we look ahead to the University's 60th anniversary.

Starting this year, we are going to be working with students on the exciting new Diamond Garden project, planting 300 fruiting trees to create an orchard on the Southern Slopes of the Canterbury Campus.

We are also planting a fruit tree and wildflower meadow on the Rochester Lawn at our Medway campus. The trees will be planted at an event this year with incoming undergraduates, marking the start of their special journey to becoming the Class of 2025, and growing with them before they graduate in our Diamond Anniversary year. This marks the start of a three-year project as we develop the Diamond Garden to become a space that will support people and wildlife in this area of the campus. Read More

Source: Staff news Kent's Diamond Garden – Grow With Us! **By Miriam Sandiford**

Kent's International Family Arts Festival! Sat 27 and Sun 28 August: A magical weekend of performance and creativity for all ages

BOing! is an annual event run by the Gulbenkian Arts Centre, University of Kent, free to enter thanks to funding from Arts Council England. On Sat 27 and Sun 28 August our annual @boingfestival again welcomed the most innovative and exciting performers from across Europe to the Gulbenkian Arts Centre and the beautiful University of Kent campus in Canterbury.

It was fantastic to welcome an amazing 12,000 people coming together from across the community to enjoy a weekend of exciting and innovative theatre, music and dance on campus. For more details visit the **bOing website**.

University of Kent Twitter post about the @bOing festival

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