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photondelta.eu

# Welcome!

We are very happy to welcome you at the physical DutchPhotonicsEvent 2022.

Many thanks to our host for giving us this opportunity to realize our yearly event on such a fantastic location. Special thanks to Arie den Boef and Liane Wemekamp with their inexhaustible help and devotion to make it a perfect day for everyone.

Also special thanks to the Program Commission, with whom we have been preparing this event for many months. We want to introduce them:

- ➢ Carlas Smith TU Delft
- Eddy Schipper RVO
- Femius Koenderink Amolf
- Frans Harren Radboud University
- Gerrit Polder
  WUR
- Herman Offerhaus
- Johannes de Boer
  VU Amsterdam
- ➢ Jorn Smeets
  PhotonDelta
- Patty Stabile Eindhoven University of Technology
- Ruud Verdaasdonk Twente University
- Silke Diedenhofen Dutch Research Council (NWO)

We wish you a fantastic day and a fantastic event. We already look forward to meeting you at the 2023 edition!

Ron van der Kolk & Petra Wicherink





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# Time schedule

08:30 - 9:30	Registration	Reception desk building 7
09:30 - 9:40	Opening PhotonicsNL ASML	Auditorium
09:40 - 10:00	First Key note speaker: Dr. Maarten Voncken (ASML)	Auditorium
10:00 - 10:15	Second Key note speaker: Dr. Irwan Setija (ASML)	Auditorium
10:30 - 11:30	Conference session: <i>Teraherz Optics &amp; Photonic systems</i>	Auditorium
	B2BMatchmaking	Rooms 1.047, 1.049, 1.051
11:15 - 11:45	Break Exhibition Poster presentations	Exhibition floor
11:30 - 13:00	Workshop 'Prof meets CTO'	Room -1.005
11:45 - 12:45	Conference session:	Auditorium
	B2BMatchmaking	Rooms 1.047, 1.049, 1.051
12:45 - 14:00	Lunch break Exhibition	Exhibition floor
14:00 - 14:15	Third Key note speaker: Drs. Ewit Roos (PhotonDelta)	Auditorium
14:15 - 15:35	Conference session: <i>Quantum Photonics</i> B2BMatchmaking	Auditorium Rooms 1.047, 1.049, 1.051
15:35 - 16:05	Break Exhibition Poster Presentation	Exhibition floor
16:05 - 17:15	Conference Session: In vivo optics	Auditorium
	B2BMatchmaking	Rooms 1.047, 1.049, 1.051
17:15 - 18:30	Winner Poster Award Snacks & drinks Networking	Exhibition floor

21-sep-2022	Program Photonics Conference
ASML	
	'Something for everyone'
08:30	Registration at Building 7
Openina	Welcome

Opening	Welcome
	Arie den Boef and Ron van der Kolk
09.30 - 09.40	ASML and PhotonicsNL

	Chairman of the day: Prof. dr. Arie den Boef
	Key note I
	Dr. Maarten Voncken
09:40 - 10:00	ASML
	Chips industry, ASML and Photonics & Optics
	Key note II
	Dr. Irwan Setija
10:00 - 10:15	ASML
	Exploring photonic sensing methods in wafer metrology

	Teraherz Optics & Photonic systems	
	Session chair: Dr. Gerrit Polder	
	Prof. dr. Jaime Gómez Rivas	
10:15 - 10:35	Eindhoven University of Technology	
	Is it possible to make a perfect optical cavity?	
		த் ப
	Dr. Pierre Gellie	maki
10:35 - 10:55	Lytid (France)	atchr
	THz applications of CW lights sources	Ĕ

	THz applications of CW lights sources	8
-		B2
	Dr. Dook van Mechelen	
10:55 - 11:15	Eindhoven University of Technology	
	The path of THz technology to the consumer market	

11:15 - 11:45 Brook	Exhibition
11.15 - 11.45 Dreak	Poster Presentations

	Free space optical communication	
	Session chair: Arie den Boef	
	Dr. Wim Korevaar	
11.45 - 12:05	TNO	
11.45 - 12:05	Optical Laser Communications - Photonics to Enable the Next Generation of Laser	
	Communication Terminals	
		aking
	Dr. Ketema Mekonnen	chme
12:05 - 12:25	TNO	matc
	Steered narrow optical beams for next generation indoor wireless communication	B2B
		_
	Prof. Jean-Paul Linnartz	
12:25 - 12:45	Signify	
	Densifying wireless access: optical beams as a logical next step towards massive IoT	

12:45 - 14:00 Lunch break Exhibition

	Key note III
	Drs. Ewit Roos
14:00 - 14:15	PhotonDelta
14.00 - 14.15	Semiconductor sovereignty in Europe and the significance of integrated photonics and the
	Dutch National Growth Fund

	Quantum Photonics	
	Session chair: Prof. dr. ir. Herman Offerhaus	
	Prof. dr. ir. Martijn Heck	
14:15 - 14:35	Eindhoven Hendrik Casimir Institute	
	Photonic integration for quantum technology	
	Prof. dr. Erik Bakkers	
14:35 - 14:55	Eindhoven University of Technology	Bu
	Towards lasing from hexagonal SiGe	maki

	Towards lasing from nexagonal orde	5
		atchi
	Associate Prof. dr. Jan Klaers	B m
14:55 - 15:15	Twente University	B2
	Coherent network computing for the solution of optimization problems	
	Dr. Pieter de Witte	

	Dr. Pieter de Witte
15:15 - 15:35	Quantum Delta
	Introduction to Quantum Delta NL

# 15:35 - 16:05 Break Exhibition Poster Presentations

	In vivo optics	
	Session chair: Prof. dr. Johannes de Boer	
	Prof. dr. Ruud Verdaasdonk	
16:05 - 16:15	TechMed Center, Twente University	
	MDR regulations impact on photonics devices for healthcare	
	Dr. Ata Chizari	bo
16:15 - 16:35	Twente University	
10.15 - 10.35	Wireless perfusion imaging to assist plastic surgeons during free flap breast reconstruction	chmaking
		mat
	Dr. Daniel Martijn de Bruin	B2B
16:35 - 16:55	Amsterdam UMC	
	Optical Coherence Tomography during urological surgery	
	Asst. Prof. Imran Avci	
16:55 - 17:15	VU Amsterdam	
	Photonic chips for diagnostic applications	

Final	Poster winner, snacks & drinks
17:15 - 18:30	





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# Workshop 'Prof meets CTO'

#### 11:30 - 13:00 | Room -1.005

#### **Host: Jorn Smeets**

This interactive workshop is a collaboration of PhotonDelta, Saxion University of Applied Sciences, Fontys University of Applied Sciences and The Haque University of Applied Sciences.

During this workshop lecturers of the three Universities of Applied Sciences will explain current practiceoriented research projects and discuss new developments and the possibilities or ideas for new projects. But they also would like to know what subjects you, as a company, are interested in and how this can be requested and elaborated in a project. And what trends do you see and how can more research be done on this?

These three universities have lecturers and research groups who are engaged in practice-oriented research in the field of (integrated) photonics. These groups are involved in the National Growth Fund proposal PhotonDelta. You will also find them in the exhibitor area with a table top where they can also answer your questions.



# **Poster session**

#### 11:15 – 11:45 and 15:35 – 16:05 | Exhibition area, location P

To be able to increase the future workforce in photonics, the students, PhD's and PostDocs are a very important group. Students from different universities as well as from the Universities of Applied Sciences are proud to show you their work. Get to know them and discuss their posters during the **Poster Session**.

Cast your vote for the best poster, as for the winner there will be the Poster Award and a cash amount of €250!



# Job alert walls

#### During the whole event | Exhibition area, location J

Photonics is growing, photonics is booming. Do you want to work in and with this attractive and very interesting technology? Check the job offers in the job alert area and maybe your new future in photonics will start today!



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Exhibitors

Catering (2 points)



IJ

Poster session

Job alert walls



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# **Overview Golden Sponsors & exhibitors Location Poster Session & Job alert walls**

#### **Golden Sponsors**

Stand #	Company name
1	Laser2000
2	Admesy
3	Te Lintelo Systems
4	QuiX Quantum
5	Hamamatsu Photonics
6	Avantes

#### Exhibitors

Stand #	Company name
7	Edmund Optics Europe
8	LouwersHanique
9	MKS Instruments
10	Molenaar Optics
11	Photonis
12	SEDI-ATI Fibres Optiques
13	Ocean Insight
14	Delta Diagnostics (start-up)
15	ISTEQ
16	NTS Optel
17	InfraTec
18	Edhouse
19	Sensing360 (start-up)
20	PHOTON IP (start-up)
21	PhotonDelta/HHS/Saxion/Fontys
22	Anteryon
23	Keyence
24	PI Benelux
25	Somni Solutions
26	PhotonicsNL

#### **Poster Session**

P Location Poster Session
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#### Job alert walls

J	Location Job alert walls
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# Meet the



# Laser2000 Benelux

Stand #1

# The Future of Photonics

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Stand #3

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QuiX Quantum is a photonic quantum computing start-up and was founded in 2019 in Enschede (the Netherlands).

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Stand #4

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Stand #6

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Stand #15

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PHOTON IP is a deeptech startup based in Eindhoven, the Netherlands, developing cutting edge technologies for advanced photonics applications.

#### Contact details:

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- geert@photonip.tech
- <u>www.photonip.tech</u>



# PhotonDelta

In collaboration with: The Hague University of Applied Sciences Fontys University of Applied Sciences Saxion University of Applied Sciences

Stand #21

#### The Gateway to Integrated Photonics

As a European hub for the integrated photonics industry, PhotonDelta is an ecosystem that researches, designs, develops, and manufactures integrated photonic chip solutions. Together with the Universities of Applied Sciences they have opened up the possibilities for the Dutch photonics industry to collaborate with their researchers and students.

Contact details:

Erik van Oorschot | erik.vanoorschot@photondelta.com | 06 2834 0951| <u>www.photondelta.com</u>



# PhotonicsNL

Stand #24

The national association for Photonics and Optics in the Netherlands

PhotonicsNL stimulates photonics and optics innovation and economic activity. We enable collaborations and cross-fertilization in the photonics value chain. We propagate the importance of photonics for our economy and in all levels of education. And we promote the national photonics community in the Netherlands and abroad.

Among other things we do this by organizing networking, knowledge and matchmaking events, by participating in international trade missions, by creating links between our members and by collaborating in European projects with other national clusters.

Contact details: Ron van der Kolk | ron.vanderkolk@photonicsnl.org | <u>www.photonicsnl.org</u>

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Stand #10

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#### Contact details: Erik Reichardt & Sander Slagter | benelux@pi.ws | +31 499 375 375 | www.physikinstrumente.nl/en



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Stand #12

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Stand #25

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# **Chairs of the conference**

# Day chair



**Prof. dr. Arie den Boef** ASML Netherlands

Arie den Boef worked at Philips from 1979 till 1997 in the area of laser diodes, optical metrology, AFM, MRI and CD-Recordable. In 1997 he joined ASML where he started exploring optical wafer metrology. Den Boef was appointed part-time professor in 2016 at the Vrije Universiteit.

# Session chair Teraherz Optics & Photonic systems (10:15 - 11:15)



**Dr. Gerrit Polder** Wageningen University & Research

Gerrit Polder is senior researcher Image Analysis and Machine Vision at the department Greenhouse Technology of Wageningen University and Research Center. His focus is on spectral sensing and photonics for plant phenotyping and precision agriculture.

# Session chair Free space optical communication (11:45 - 12:45)



**Prof. dr. Arie den Boef** ASML Netherlands Arie den Boef worked at Philips from 1979 till 1997 in the area of laser diodes, optical metrology, AFM, MRI and CD-Recordable. In 1997 he joined ASML where he started exploring optical wafer metrology. Den Boef was appointed part-time professor in 2016 at the Vrije Universiteit.

# Session chair *Quantum Photonics* (14:15 - 15:35)



**Prof. dr. ir. Herman Offerhaus** Twenty University

Herman Offerhaus received his doctorate degree in Applied Physics at Twente University. He was a postdoc at the ORC in Southampton and at AMOLF in Amsterdam. He now is chair of the Optical Science group at Twente University. Areas of research include linear and nonlinear microscopy and spectroscopy, spatial and spectral control of light, near field optics, laser construction and holography.

# Session chair In vivo optics (16:05 - 17:15)



Prof. dr. Johannes de Boer

VU Amsterdam

Johannes de Boer is professor biophotonics at the VU Amsterdam. He spent more than ten years in the US, at UC Irvine and Harvard Medical School, before returning to the Netherlands in 2008. He has pioneered coherent optical imaging techniques for medical applications such as retinal imaging and lung endoscopy.

# **Speakers of the conference**

# First key note (9:40 - 10:00)



Dr. Maarten Voncken

ASML Netherlands

**Title:** Chips industry, ASML and Photonics & Optics

#### Abstract:

The chips industry is going through large changes, driven by the further pace of Moore's law and the new applications that are enabled by this. ASML plays a key role in this process, by enabling each new generation of chips. In this presentation, we will highlight the evolution of the semiconductor landscape, the role ASML plays, and how light and optics stand at the basis of these developments.

#### **Biography:**

Maarten Voncken has a background in physiscs (Master and PhD at the Radboud University Nijmegen). He has been working at ASML for 18 years, and is currently director or the Research Metrology department.

## Second key note (10:00 - 10:15)



## Dr. Irwan Setija

ASML Netherlands / Parttime professor Applied Physics at Eindhoven University of Technology

#### Title:

Exploring photonic sensing methods in wafer metrology

#### Abstract:

Photonics is an extremely broad field of research and in connection with ASML, the link to accurate imaging is easily made. In this talk I would like to show examples of academic collaborations in which ASML explores novel photonic sensing technology for wafer metrology.

#### **Biography:**

Irwan Setija started at ASML in 1997 and has always been involved in optical wafer metrology. Starting with the introduction of ATHENA, the first off-axis alignment sensor, and its successor SMASH, he then contributed to the first Yieldstar CD and OV metrology tool, mainly through the development of numerical algorithms.



# Session: Teraherz Optics & Photonic systems (10:15 – 11:15)



Prof. dr. Jaime Gómez Rivas

Eindhoven University of Technology

**Title:** Is it possible to make a perfect optical cavity?

#### Abstract:

Photonics is an extremely broad field of research and in connection with ASML, the link to accurate imaging is easily made. In this talk I would like to show examples of academic collaborations in which ASML explores novel photonic sensing technology for wafer metrology.

#### **Biography:**

Irwan Setija started at ASML in 1997 and has always been involved in optical wafer metrology. Starting with the introduction of ATHENA, the first off-axis alignment sensor, and its successor SMASH, he then contributed to the first Yieldstar CD and OV metrology tool, mainly through the development of numerical algorithms.



**Dr. Pierre Gellie** Lytid (France)

**Title:** THz applications of CW lights sources

#### Abstract:

This presentation will cover the wide range of THz applications using CW sources and systems in the science field but also increasingly in the industrial field. This will range from state-of-the-art GaAs THz QCL sources for scientific applications to low-cost THz sensing based on silicon technology.

#### **Biography:**

Pierre Gellie has 15 years of experience in the field of THz technologies, stating with a PhD on THz QCL to the co-funding and CTO position at Lytid since 2015.



**Dr. Dook van Mechelen** Eindhoven University of Technology

**Title:** The path of THz technology to the consumer market

#### Abstract:

Although research of the past decades has opened up the previously called THz gap, today there are hardly commercial applications using THz radiation. On the other hand, the EU Chips Act – aiming to double the current chip production in the EU by 2030 – pushes the design and development of novel generation chips operating at THz frequencies. In this talk I will present the status quo of the technology in the context of the myriad suggested THz applications. Subsequently, I will discuss a path where upcoming technological advances and large volume consumer applications could meet.

#### **Biography:**

Dook van Mechelen is an associate professor at TU/e focusing on maturing THz technology and spectroscopy for industrial and consumer applications by studying fields of light-matter interaction, innovative signal processing and customer demands.



# Session: Free space optical communication (11:45 – 12:45)



# Dr. Wim Korevaar

TNO

#### Title:

Optical Laser Communications - *Photonics to Enable the Next Generation of Laser Communication Terminals* 

#### Abstract:

Optical laser communications allows for a wireless 'fiber-in-the-sky' and enables terabit-per-second datarates. Such datarates are unprecedented in the radio frequency domain, especially for long-distance

communications. During this presentation an overview of the key use cases, techniques, challenges and opportunities for optical laser communications are provided. There is particular emphasis on the role of photonics and how (integrated) photonics can facilitate the next generation of laser communication terminals.

#### **Biography:**

Wim Korevaar is Communications System Engineer at TNO and working on the system design, standardization and modem developments of laser and quantum communication terminals, in particular for space applications.



# Dr. Ketema Mekonnen

TNO

#### Title:

Steered narrow optical beams for next generation indoor wireless communication

#### Abstract:

Wireless traffic is exploding around us. This exerts enormous pressure on the current radio based indoor wireless networks where most of the traffic originates. Optical-wireless communication using steered narrow beams is a promising solution to tackle the impending capacity crunch in the wireless domain. In this presentation, some of the challenges and possible solutions in such a system, such as beam steering, device localization and optical-wireless receivers are discussed.

#### **Biography:**

Ketema Mekonnen is a research scientist with TNO at the Holst Center in Eindhoven. He is currently working in integrated photonics for applications in optical-wireless communication, LIDAR, datacom etc.



# **Prof. Jean-Paul Linnartz**

Signify

## Title:

Densifying wireless access: optical beams as a logical next step towards massive IoT

#### Abstract:

The amount of traffic carried by our wireless networks grows at an exponential rate. The vast majority of data will reach end users that are inside buildings, where many users are using the same network. Extrapolating a trend of higher communication needs per device (bit/s) and a densification of client devices (bit/s/m2), Jean-Paul Linnartz will describe the potential and the challenges in using optical wireless links.

Using light to communicate wirelessly inherits the potential but also limitations from fibre communication and from RF radio communication.

#### **Biography:**

Jean-Paul Linnartz is a Research Fellow at Signify and Professor at TU Eindhoven.

As a senior director at Philips, he previously headed research groups in security, communications and in IC design. His work has been cited 11,000 times (GS) and his work has been the technical foundation for three start-ups.



# Third key note - afternoon session (14:00 - 14:15)



**Drs. Ewit Roos** PhotonDelta

Title:

Semiconductor sovereignty in Europe and the significance of integrated photonics and the Dutch National Growth Fund

#### Abstract:

With the semiconductor industry becoming a geopolitical issue, the EU is now aiming for tech sovereignty in this field and recently presented the Chips Act. Ewit Roos, CEO at PhotonDelta, will clarify the position of the Dutch integrated photonics industry in Europe and the strategy as outlined in the Dutch National Growth Fund proposal. By awarding this proposal, PhotonDelta will land  $\in$ 1.1 billion to fund its six-year program to invest in application technology, industrialisation, ecosystem development and internationalisation.

#### **Biography:**

Ewit Roos has been the CEO of PhotonDelta Foundation since January 2018. As of 2014 he was Managing Director of PhotonDelta and before that he was Managing Director of early-stage high tech investment fund BrightMove. His main responsibility is to support the realization of the goals of the Dutch integrated photonics industry.



# Session: Quantum Photonics (14:15 - 15:35)



**Prof. dr. ir. Martijn Heck** Eindhoven Hendrik Casimir Institute

**Title:** Photonic integration for quantum technology

#### Abstract:

Breakthroughs in quantum science show a lot of promise for the fields of communications, computing and sensing. However, real-world manufacturable and scalable quantum technologies are still somewhat elusive. In this talk I will discuss the opportunities of mature integrated photonic technology platforms for their use as QPICs, quantum photonic integrated circuits.

#### **Biography:**

Martijn Heck obtained his PhD from Eindhoven University of Technology, where he is currently a full professor in the Photonic Integration group and Scientific Director of the Eindhoven Hendrik Casimir Institute. He was a postdoc at VU Amsterdam and UC Santa Barbara, and Associate Professor at Aarhus University until 2020.



# Prof. dr. Erik Bakkers

Eindhoven University of Technology

#### Title:

Towards lasing from hexagonal SiGe

#### Abstract:

Silicon and germanium cannot emit light efficiently due to their indirect bandgap, hampering the development of Si-based photonics. However, alloys of SiGe in the hexagonal phase are predicted to have a direct band gap. In this work, we exploit the unique feature of the nanowire growth mechanism to control the crystal structure. We show efficient light emission from hexagonal SiGe, up to room temperature, accompanied by a short radiative life time of around a nanosecond, the hallmarks of a direct band gap material. The next challenge is to demonstrate lasing from this new material.

#### **Biography:**

Erik Bakkers received his PhD in Physical Chemistry in Utrecht in 2000. He worked at Philips Research from 2000-2010. He has been a full professor since 2010 at TU Delft and Eindhoven University of Technology. Since 2017 only at Eindhoven University of Technology.

# Associate Prof. dr. Jan Klaers



Twente University

### Title:

Coherent network computing for the solution of optimization problems

#### Abstract:

Finding the energetic ground state of a magnet with disordered internal couplings is a complicated combinatorial problem. This so-called spin-glass problem has no analytic solution and even numerical techniques are found to be inefficient. It is known that many important optimization problems in machine learning, logistics, computer chip design, and DNA sequencing can be mathematically mapped to an equivalent spin-glass problem. A method for solving this problem can thus serve as a blueprint for approaching a large class of mathematical optimizations. This motivates research on analog spin-glass simulators as a new class of computational devices (coherent network computing). I will give an overview of the experimental progress in this area including the achievements of our group.

#### **Biography:**

Jan Klaers did my PhD at the University of Bonn in 2011. After a postdoc stay at ETH Zurich, he started to build up a research group at the University of Twente in 2017. His group investigates networks of coupled photon Bose-Einstein condensates and their potential application in solving optimization problems.



## Dr. Pieter de Witte

Quantum Delta NL

**Title:** Introduction to Quantum Delta NL

#### Abstract:

Pieter de Witte will give an overview of the program Quantum Delta NL, which is funded by the Dutch National Growth Fund, show ways to engage in the quantum ecosystem and share some ideas where quantum and photonics meet.

#### **Biography:**

Pieter de Witte is director of Research Programmes and IP at Quantum Delta NL. Before joining QDNL he worked at NWO on the strategy for key enabling technologies. In the past has worked for topsector Holland High Tech, and physics foundation FOM on research partnerships between academic groups and industry.



# Session: *In vivo optics* (16:05 – 17:15)



Prof. dr. Ruud Verdaasdonk

TechMed Center, Twente University

#### Title:

MDR regulations impact on photonics devices for healthcare

#### Abstract:

Many biophotonic devices originate from developments within research institutes. Due to the Medical Device Regulations (MDR), prototypes need to be produced according a QMS (like ISO 9001/13485) to get approval from an ethical committee to perform a clinical study to prove effectiveness. Flowcharts, guidelines and forms have been developed to support researchers to ease the preparation of the necessary documents and the transfer to medical companies towards CE certification. However, the capacity of ethics committees, clinical studies and notified bodies is limited. Consequently, we need to prevent that new biophotonic devices might not reach medical practice and current devices could be withdrawn in the next years.

#### **Biography:**

Rudolf Verdaasdonk is chair Health Technology Implementation at University of Twente. With >30 year's experience as clinical physicist and inventor, he advises researchers on the route from invention to product with MDR and clinical studies. He is member of the Central Committee on Research Involving Human Subjects (CCMO) and EU MDR expert panel.



**Dr. Ata Chizari** Twente University

#### Title:

Wireless perfusion imaging to assist plastic surgeons during free flap breast reconstruction

#### Abstract:

We aim to assist plastic surgeons evaluate viability of a transplanted breast tissue in order to prevent complications in a deep inferior epigastric perforators (DIEP) flap surgery after removal of breast cancer. To do so, we have developed a wireless laser speckle contrast imaging (LSCI) device suitable for use in operation room. LSCI is a non-contact method for objective assessment of skin perfusion. It is a

promising approach for intraoperative applications in that it does not require any contrast agent and can be implemented in compact size and with affordable price. Such advantages make LSCI a potential alternative to the existing fluorescent imaging devices that are not only costly and bulky but also require injection of contrast agents on a regular basis.

#### **Biography:**

Ata Chizari is a postdoctoral researcher at biomedical photonic imaging group, university of Twente, the Netherlands. His research interests include laser speckle contrast imaging, laser Doppler perfusion imaging and speckle metrology.



# Dr. Daniel Martijn de Bruin

Amsterdam UMC

**Title:** Optical Coherence Tomography during urological surgery

#### Abstract:

Several oncological surgery scenarios, such as suspected lesion finding, lesion differentiation or tumour margin clarification will benefit from real-time and quantitative imaging. Optical Coherence Tomography (OCT) systems interfaced with needle based or endoscopic catheters are developed to address these scenarios. Additional light-tissue based quantification of the acquired data also allows for tissue stratification, such as the assessment of tumour grade (aggressiveness) and stage (invasiveness). We will present the latest results of quantitative OCT in urology during minimal invasive surgery of urothelial cancer and percutaneous (through the skin using small needles) diagnosis of kidney cancer.

#### **Biography:**

Martijn de Bruin is principal investigator at both the departments of urology and biomedical engineering & physics at the Amsterdam UMC. He holds multiple grants on several projects and published over 120 papers covering novel optical and digital diagnostic imaging technologies and focal therapeutic modalities of benign and malignant disease.



# Asst. Prof. dr. Imran Avci

VU Amsterdam

**Title:** Photonic chips for diagnostic applications

#### Abstract:

Photonic chips are becoming more and more available in diagnostic applications such as biosensing and optical imaging. During this talk, I will walk you through these exciting applications and demonstrate how we make these chips in-house using a simple and fast technique.

#### **Biography:**

Dr. Avci received her PhD degree from the Integrated Optical Microsytems Group at the University of Twente in 2012. As of September 2017, she is a tenured assistant professor at the VU University Amsterdam, Department of Physics and Astronomy. Her research combines integrated optics with different imaging and sensing modalities in order to realize novel portable, affordable and higher sensitivity devices.

# Thank you for your visit today.

We look forward meeting you at the DutchPhotonicsEvent of 2023!

