

# WORKSHOP:

# Sputtering for Precision Optics II – Digital Transformation Driven Trends in the Coating Technology

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June 11<sup>th</sup> – 12<sup>th</sup>, 2024  
Bühler Leybold Optics, Alzenau, Germany

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## Introduction

Photonic technologies play a key role in the ongoing trend towards digitalisation in almost all areas of technology and everyday life. Photonic sensors, integrated optics and miniaturised optical systems enable technological innovations, new monitoring methods and process optimisation for the digitalisation and automation of the industrial production.

The production of such optical systems and the development of new markets and applications requires further development of technologies and the in-depth characterisation of complex processes in the optical manufacturing. The aim is to design these precisely and cost-effectively and to develop the manufacturing processes. Compared to processes in the electronics production, the effort involved is usually higher due to the significantly greater range of functions, materials and structures. At the same time, an increasing fusion of both areas, e.g. optical functionality at wafer level, can be recognised. This is referred to as Wafer Level Optics.

Innovative production technologies for optical coatings, e.g. for anti-reflective coatings and dielectric mirrors, filters, beam splitters and waveguides are essential for applications in the miniaturized optical systems and integrated optics, for image processing, photonic sensors and in the semiconductor industry. Sputtering technology is one of these modern technologies. In this workshop, we would like to show you new, digitalization driven trends in the technologies and applications and how a wide variety of coating materials with the desired properties can be applied to optics made of glass, metal or other materials.

# PROGRAM\*



**Tuesday,  
June 11<sup>th</sup>, 2024**

11:00 | **Participant Registration**

12:00 | **Welcome Words & Opening**  
Dr. Steffen Runkel | Bühler Alzenau GmbH,  
Germany & Udo Klotzbach | EFDS e.V.

## Session 1 | Keynotes

12:20 | **Trends, Opportunities and Challenges  
for the Optical Coating Industry**  
Dr. Mathias Mende | Edmund Optics GmbH,  
Germany

12:50 | **Emerging Applications in Photonics:  
Optical Thin Films in Semiconductor Devices**  
Dr. Stephan Mingels & Dr. Christian Schindler |  
Bühler Leybold Optics, Germany

13:20 | **Gold Sponsor Company Pitch**  
André Kayser | Hiden Analytical Europe GmbH,  
Germany

**13:25 | COFFEE BREAK**

## Session 2 | Miniaturized and Integrated Optics

14:00 | **Shincron's PVD Technology for Optics  
and Photonics Integrated Circuit Applications**  
Dr. Takuya Sugawara | Shincron Co. Ltd., Japan

14:25 | **EUV Multilayer Coatings with NESSY  
Coaters – Exploring Physical Limits**  
Dr. Torsten Feigl | optiX fab GmbH, Germany

14:50 | **Thin Film Trends in Integrated Optics**  
Dr. Ronald Dekker | LioniX International B.V.,  
The Netherlands

15:15 | **Miniaturized Substrateless Thin Film  
Filters for Optics Integration**  
Dr. Gerd-Albert Hoffmann | Laser Zentrum  
Hannover e.V. (LZH), Germany

**15:40 | COFFEE BREAK**

## Session 3 | Imaging and Sensors

16:00 | **Microwave Plasma Assisted Deposition  
of Optical Coatings and Applications in  
Photonic Sensors and Imaging**  
Prof. Dr. Des Gibson | University of the West of  
Scotland & Albasense Ltd, United Kingdom

16:25 | **Optical Precision on the Reverse Side:  
Requirements and Solutions for Double-Sided  
Coatings**  
Michael Schneider | Von Ardenne GmbH, Germany  
& Stefan Bruns | Fraunhofer Institute for Surface  
Engineering and Thin Films IST, Germany

16:50 | **Photolithographic structuring of complex  
PARMS filters**  
Marc Lappschies | Optics Balzers Jena GmbH,  
Germany

17:15 | **Wafer Level Patterning of Optical Filters:  
Seeing Things Differently.**  
Wouter Charle | imec, Belgium

17:40 | **Summary of the First Workshop Day**

17:50 | **End of 1st Workshop Day**

## GET TOGETHER

19:00 – 22:00 | **JOINT DINNER**

# PROGRAM\*



**Wednesday,  
June 12<sup>th</sup>, 2024**

08:20 | Registration

## **Completion Session 3 | Imaging and Sensors**

08:35 | **Challenges in High Quality and Low Defect Mirror Depositions for MEMS Applications**

Maria Esperanza Navarro Fuentes | Fraunhofer Institute for Photonic Microsystems IPMS, Germany

## **Session 4 | Trends & Innovations I**

09:00 | **Multilayer Coating for Femtosecond and Attosecond Physics**

Dr. Vladimir Pervak | Ludwig-Maximilians-Universität München, Germany

09:25 | **Light-Tunable Optical Metasurfaces**

Dr. Purushottam Poudel | Friedrich-Schiller-University Jena, Germany

09:50 | **Target Materials - A Vital Role in Coating Operations, Looking at Quality and Sustainability**

Alfred Willer | Sindlhauser Materials GmbH, Germany

**10:15 | COFFEE BREAK**

## **Session 5 | Trends & Innovations II**

11:15 | **Semiconductor Deposition Equipment for Precision Optics**

Dr. Taguhi Yeghoyan | Yole Group, France

11:40 | **Measuring Ultra-Low Optical Losses in Optical Materials and Coatings: The Key to Process Improvement**

Dr. Christian Mühlig | Fraunhofer Institute for Applied Optics and Precision Engineering IOF, Germany

12:05 | **Photonic Technologies as an Indispensable Key Enabler for Innovations in Quantum Technology.**

Dr. Bernd Jungbluth | Fraunhofer Institute for Laser Technology ILT, Germany

**12:30 | LUNCH BREAK**

## **Session 6 | Interactive Exchange**

13:30 | **Discussion on Research & Cooperation Needs**

Moderation by Dr. Christian Schindler | Bühler Leybold Optics & Participants

13:55 | **Guided Tour through the Bühler Leybold Optics "Application Center for Thin-Film Solutions"**

the participants split into groups

**15:30 | END OF THE WORKSHOP**

\* Program – Current status 04/06/2024 | Changes possible





# GENERAL

## Participant fees

**Early bird ticket (Standard)** ..... **730 EUR**  
until April 10, 2024

**Participation ticket (Standard)** ..... **830 EUR**  
from April 11, 2024

**Participation ticket (Student)** ..... **420 EUR**  
Please send us a copy of your valid student ID to [info@efds.org](mailto:info@efds.org).

Participation fees are tax-free according to §4 (22a) UStG.

## Online Registration

Please register on the website  
<https://efds.org/en/event/workshop-optic-ii/>



## Event Location

Bühler Alzenau GmbH  
Siemensstraße 88  
63755 Alzenau, Germany

### Workshop Committee:

Dr. Christian Schindler | Bühler Leybold Optics

Dr. Diana Tordova | Carl Zeiss Jena GmbH

Dr. Adriana Szeghalmi | Fraunhofer IOF Jena

Uwe Heydenreich | TRUMPF Hüttinger GmbH + Co. KG

Anja Härtel | EFDS e.V.

## Event Management

**Europäische Forschungsgesellschaft  
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## Data protection declaration

We would like to inform you that the event will be documented photographically. By participating, you agree that all pictures taken may be used by the EFDS for communication and marketing purposes. In accordance with your consent when registering online, a list of participants with names and company affiliation will be compiled and published exclusively in the conference proceedings. The data will be collected in accordance with the privacy policy of the European Society of Thin Films. The data protection declaration can be found at

<https://efds.org/en/privacy-policy-2/>.