PREFACE

A topical workshop with focus on industrialization and commercialization of ALD for current and emerging markets

Atomic Layer Deposition (ALD) is used to deposit ultraconformal thin films with sub-nm film thickness control. The method is unique in the sense that it employs sequential self-limiting surface reactions for growth in the monolayer thickness regime. Today, ALD is a key technology in leading edge semiconductor technology and the field of application in other leading-edge industries is increasing rapidly. According to market estimates the equipment market alone is currently at an annual revenue of US$ 1.5-1.7 billion (2017) and it is expected to double in the next 4-5 years.

In a European context ALD was invented independently twice in Europe (Russia & Finland) and since the last 15 years Germany has grown to become one of the strongest European markets for ALD in R&D, chemicals, equipment and end users.

The Event will focus on the current markets for ALD and addresses the applications in semiconductor industry, MEMS & Sensors, Battery Technology, Medical, Display, Lightning, Barriers and Photovoltaics.

PROGRAM COMMITTEE

Jonas Sundqvist
Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Germany

Christoph Hossbach
Picosun Oy and Picosun Europe GmbH, Germany

Katrin Ferse
European Society of Thin Films (EFDS), Germany

Henry Bernhardt
Infineon Technologies Dresden GmbH, Germany

Anjana Devi
Ruhr-University, Bochum, Germany

Program - Tuesday, March 19, 2019

Practical ALD Show

10:00	*Opening*
10:00	**ALD Systems and Services – A Practical Training** Christoph Hossbach[1], Tiina McKee[2], [1]Picosun Europe GmbH, Germany; [2]Picosun Oy, Finland
10:30	**ALD - Precursor Systems** Daniel Schlamm, SEMPA Systems GmbH, Germany
10:50	**Vacuum Pumps for ALD Applications** Andrew Irvine, Edwards, Germany
11:10	**Dry Bed Chemisorption for the Waste Gas Abatement of ALD Processes** Joe Guerin, CS Clean Solutions AG, Germany
11:30	**In-situ process monitoring – A guidance of using Quadrupole mass spectrometer for ALD process monitoring** Uwe Meissner, MKS Instruments, Germany
12:00	*Lunch Break*

Tutorial

13:00	*Opening*
13:10	**ALD Technology – Introduction, History & Principles** Riikka Puurunen, Aalto University School of Chemical Engineering, Finland
14:00	**Atomic layer deposition of group 13 nitrides** Henrik Pedersen, Linköping University, Sweden
14:30	**ALD/CVD applications, equipment and precursors in high volume manufacturing** Jonas Sundqvist, Fraunhofer IKTS, Germany
15:00	*Coffee Break*
15:30	**An introduction to Atomic Layer Deposition equipment: how it's made and how it's used** Paul Poodt, Holst Centre/TNO and SALDtech B.V., The Netherlands
16:00	**The role of precursors in ALD processes: An overview of recent progress in precursor chemistry** Prof. Anjana Devi, Ruhr-University Bochum, Germany
16:30	**Metrology for ALD process monitoring and development** Martin Knaut, Technische Universität Dresden, Germany
17:00	*End of First Day*

March 19,2019

10:00 - 17:00 **Industrial Exhibition**

19:00 **Get-Together**
Restaurant „Brauhaus Lemke am Hackeschen Markt"
Dircksenstraße, S-Bahnbogen 143,
10178 Berlin

EFDS

Program - Wednesday, March 20, 2019

Workshop

09:00	*Opening*	
09:15	*Keynote Lecture* **Forefront Research Advances in (Selective) Atomic Layer Deposition and Etching** Erwin Kessels, Eindhoven University of Technology, The Netherlands	
10:00	**Al2O3 dielectrics on different batch tools** Henry Bernhardt, Infineon Technologies Dresden GmbH, Germany	**ALD Equipment and Applications**
10:20	**Industrial ALD for 3D components and medical applications** Christoph Hossbach, Picosun Europe GmbH, Germany	
10:40	*Coffee Break*	
11:10	**ALD Use for Decorative Applications** Ganesh Sundaram, Veeco Instruments, USA	
11:30	**Memristive ALD Films for Neuromorphic Networks** Christian Wenger, IHP – Leibniz Institut für innovative Mikroelektronik, Germany	
11:50	**ALD – Enabling the frontiers for energy applications** Joos Hanssen, Euris GmbH, Germany	
12:10	**Improved Metal Oxide ALD Precursors for Industrial Applications** Andy Zauner, Air Liquide Electronics R&D, France	**ALD Precursor Development**
12:30	*Lunch Break*	
13:30	Sponsoring Pitch	
13:50	**Optimization of delivered mass from low vapor pressure precursors through process control** Jeffrey Spiegelman, RASIRC, USA	
14:10	**The Research Fab Microelectronics Germany (FMD) and related ALD activities** Bernd Hintze, Research Fab Microelectronics Germany (FMD)	**Fraunhofer research on ALD**
14:30	**Optical Coating of Polymer Substrates by ALD** Adriana Szeghalmi, Fraunhofer IOF, Germany	
14:50	*Coffee Break*	

15:20	**Atomic Layer Deposition of Lithium Titanate** Sascha Bönhardt, Fraunhofer IPMS, Germany	
15:40	**Plasma Enhanced ALD using a Capacitively Coupled Plasma in a Cross Flow Reactor** Jacques Kools, Encapsulix S.A., France	**Plasma ALD**
16:00	**Fast injection in plasma processing** Stephan Wege, Plasway Technologies GmbH, Germany	
16:20	**Homogeneous and stress controlled PEALD films for large optics** Hassan Gargouri, SENTECH Instruments GmbH, Germany	
16:40	**ALD for Optical Coatings – Materials and Applications** Kari Koski, Beneq, Finland	
17:00	*closing remarks*	
17:05	*End of ALD-Workshop*	

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General Information

	ALD for Industry	Workshop only	Tutorial only
Standard	790,00 EUR	590,00 EUR	390,00 EUR
Students	395,00 EUR	290,00 EUR	180,00 EUR

Workshop fees are free of VAT according to §4 (22a) UStG (German value-added tax law).

Terms

The general terms and conditions of sale of the EFDS apply (www.efds.org/agb). Cancellations must be made in written form. In case of the cancellation of your registration before March 05, 2019, a cancellation fee of 50,00 EUR will be charged. After this date, a refund is not possible. The EFDS processes your data according to the data privacy statement of EFDS. You can find all information at www.efds.org/datenschutz.

Fee Covers

The registration fee includes the participation of the choosen event, conference proceedings, coffee and lunch breaks and the social evening.

Online Registration

Please use the online registration:
https://www.efds.org/de/anmeldung-workshop-wsald3

Organization

European Society of Thin Films
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www.efds.org

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Venue

Fraunhofer-Forum Berlin-Mitte
Anna-Louisa-Karsch-Straße 2
10178 Berlin
Germany
Tel: +49 30 688 37595555
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www.forum.fraunhofer.de

Parking

Parking is available in the adjacent public car parks of Sealife and Radisson Blue for a fee.

Recommendation for Hotel

Monbijou Hotel Berlin
Monbijouplatz 1
10178 Berlin
Code: ALD, **Deadline: February 18, 2019**
Room Rate: 114,00 EUR per Single
Tel.: +49 30 61620300
info@monbijouhotel.com; www.monbijouhotel.com

More hotels near the event location:

- **Hotel Zoe by Amano,** Präsidentenstraße 6-7, www.amanogroup.de
- **Adina Apartment,** An der Spandauer Brücke 11, www.tfehotels.com
- **Alexander Plaza,** Rosenstraße 1, www.hotel-alexander-plaza.de
- **H2 Hotel Alexanderplatz, Karl-Liebknecht-Straße 32**, www.h2-hotels.com/de
- **Motel One**, Dircksenstraße 36, www.motel-one.com

Get-Together - Tuesday, March 19, 2019

19:00: Restaurant „Brauhaus Lemke am Hackeschen Markt“
Dircksenstraße, S-Bahnbogen 143, 10178 Berlin-Mitte
www.lemke.berlin/hackscher_markt