

OptoNet Workshop · April 14–15, 2005

# *Lithography for Photonics*

*Applications – Demands – Solutions*



Fraunhofer Institut  
Angewandte Optik  
und Feinmechanik

**optonet**  
knowledge competence cooperation

## Contents of the Workshop

The main purpose of the workshop is to get an understanding of recent achievements and future trends in photonics.

Various presentations give an insight to challenging requirements driven by different photonics applications.

Their impact on lithography systems and precision engineering components will be addressed by the workshop in the following fields:

- ~ Micro- and Nanooptical Applications
- ~ Demands on Lithography
- ~ Technologies
- ~ High Precision Tools
- ~ Chucks and Stages

Current solutions & technologies will be presented and future strategies for improvement will be touched within the workshop.

**Thursday, April 14, 2005**

**19:00 Get-together**

~ *Zeiss-Planetarium | Am Planetarium 5 | 07743 Jena*

**Friday, April 15, 2005**

**9:00 Start**

~ *Welcome*

Prof. A. Tünnermann, FRAUNHOFER IOF, GERMANY  
K. Schindler, OPTONET E.V.

**9:15 – 12:35 Session 1 – Microlithography  
for Micro- and Nanooptics**

**9:15** *Lithography for Micro- & Nanooptics*  
E.-B. Kley, INSTITUTE OF APPLIED PHYSICS,  
GERMANY

**9:45** *Photonics with Synchrotron Lithography*  
E. Di Fabrizio, INFN-TASC, ITALY

**10:10** *Lithography Requirements for Photonic Crystals  
in the Near Infrared and the Visible Spectral Range*  
R. B. Wehrspohn, UNIVERSITY OF PADERBORN,  
GERMANY

**10:35 – 10:55 Coffee Break**

**10:55** *Replication: Future Requirements/Trends  
on Tools and Replica*  
M. Rossi, HEPTAGON OY, SWITZERLAND

**11:20** *Micro- and Nanooptics for DUV-Applications*  
M. Cumme, P. Triebel, P. Weissbrodt,  
JENOPTIK L.O.S. GMBH, GERMANY

**11:45** *Nano Imprint Lithography for Manufacturing  
Nano Scale Feature Sizes in Optics and Photonics*  
N. Reng, H. Schulz, CARL ZEISS NTS GMBH,  
GERMANY, B. Vratzov, MOLECULAR IMPRINTS,  
INC., USA

**12:10 – 13:30 Lunch**

**13:30 – 16:35 Session 2 – Precision Mechanics  
for Lithography Tools**

**13:30** *Electron-beam Lithography for Micro- and Nanooptics*  
B. Schnabel, LEICA MICROSYSTEMS LITHOGRAPHY  
GMBH, GERMANY

**13:55** *Simulation of Electrostatic Chucks*  
R. Engelstad, UNIVERSITY OF WISCONSIN, USA

**14:25** *Precision Electrostatic Chucks  
for Future Lithography Tools*  
G. Kalkowski, S. Risse, FRAUNHOFER IOF,  
GERMANY

**14:50 – 15:10 Coffee Break**

**15:10** *Magnetic Levitated Scanning Stages –  
Enabling High Throughput Lithography in Vacuum*  
T. A.M. Ruijl, A. C.P. de Klerk, PHILIPS CFT,  
THE NETHERLANDS

**15:35** *Demands on Positioning Systems  
for Electron-beam Lithography Applications*  
Th. Händel, G. Schubert, LEICA MICROSYSTEMS  
LITHOGRAPHY GMBH, GERMANY

**16:00** *Assembly of an Aperture Plate System  
for Mask-Less Lithography*  
R. Eberhardt, M. Mohaupt, Ch. Damm,  
Th. Peschel, FRAUNHOFER IOF, GERMANY

**16:25** *Summary*  
O. Fortagne, LEICA MICROSYSTEMS  
LITHOGRAPHY GMBH, GERMANY

**17:00 Visit to IOF/IAP Laboratories**



## Registration

### Conference Location & Further Information

Fraunhofer-Institut

Angewandte Optik und Feinmechanik

Albert-Einstein-Straße 7 | 07745 Jena | Germany

@ ellen.kaempfer@iof.fraunhofer.de

T +49 (0) 3641 / 807 399

www.iof.fraunhofer.de

### Hotel Booking

For hotel booking (keyword: »Workshop IOF«) we recommend:

~ IBIS Hotel Jena am Holzmarkt, town centre

T +49 (0) 36 41 / 81 30, www.ibis-hotel.de

(single room 58 €, twin room 67 €)

~ Best Western Hotel Jena

T +49 (0) 36 41 / 660, www.hotel-jena.bestwestern.de

(single/twin room 57 €)

~ Steigenberger ESPLANADE, town centre

T +49 (0) 36 41 / 80 00, www.jena.steigenberger.de

(single room 87 €, twin room 99 €)

### Attendance Fee

If we have registered your attendance, you will receive a confirmation of registration including your individual invoice number. Please make sure that **your individual invoice number** is noticed on your bank transfer form.

Please arrange a bank transfer of 150 €\* (members of the German Competence Networks for Optical Technologies only pay 70 €\*) by **March 31, 2005**, at the latest, to the **account of Fraunhofer-Gesellschaft**:

> Bank: **Deutsche Bank München**

> Bank code: **700 700 10**

> Account No.: **7 521 933**

> Swift code: **DEUT DEMM**

> IBAN: **DE86 700 700 100 752 193 300**

> Purpose #1: **066/904 015**

> Purpose #2: > **your individual invoice number** <

\* **VAT-exempt** under §4 no. 22a UStG

Please fax the completed registration form  
by March 31, 2005, at the latest, to:  
+49 (0) 3641 / 807 604

- I take part in the workshop on April 15, 2005.
- I take part in the get-together on April 14, 7.00 PM.
- My company/organization is a member of the  
German Competence Networks for Optical Technologies.
- Please keep me informed about news from OptoNet.

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Title                      First name & surname

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Company/Organization

-----  
Address

-----  
Zip code                      City

-----  
Country

-----  
Phone

-----  
E-Mail

-----  
Date                      Signature

## Organizer & Contact



### Fraunhofer Institut Angewandte Optik und Feinmechanik

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### Leica Microsystems Lithography GmbH

Göschwitzer Straße 25 | 07745 Jena | Germany  
[www.leica-microsystems.com](http://www.leica-microsystems.com)  
[ines.stolberg@leica-microsystems.com](mailto:ines.stolberg@leica-microsystems.com)



### Friedrich Schiller University Jena | Institute of Applied Physics

Max-Wien-Platz 1 | 07743 Jena | Germany  
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### OptoNet e.V.

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GEFÖRDERT VOM



Bundesministerium  
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STIFT

● Conference Location

Fraunhofer-Institut  
Angewandte Optik und Feinmechanik (IOF)  
Beutenberg Campus  
Albert-Einstein-Straße 7  
D-07745 Jena

[www.iof.fraunhofer.de](http://www.iof.fraunhofer.de)

