

# PROCEEDINGS OF SPIE

## ***26th European Mask and Lithography Conference***

**Uwe F.W. Behringer  
Wilhelm Maurer**  
*Editors*

**18–20 January 2010  
Grenoble, France**

*Organised by*  
VDE/VDI GMM—The Society for Microelectronics  
Micro- and Precision Engineering (Germany)

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*Published by*  
SPIE

**Volume 7545**

Proceedings of SPIE, 0277-786X, v. 7545

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from this book:

Author(s), "Title of Paper," in *26th European Mask and Lithography Conference*, edited by Uwe F.W. Behringer, Wilhelm Maurer, Proceedings of SPIE Vol. 7545 (SPIE, Bellingham, WA, 2010) Article CID Number.

ISSN 0277-786X  
ISBN 9780819479419

Published by

**SPIE**

P.O. Box 10, Bellingham, Washington 98227-0010 USA  
Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445  
SPIE.org

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## Foreword

Welcome to the proceedings volume of the 26th European Mask and Lithography conference, EMLC2010 held 18-20 January 2010, at the MINATEC Conference Center in Grenoble, France. The conference has annually brought together scientists, researchers, engineers and technologists from research institutes and companies from around the world to present papers at the forefront of mask lithography and mask technology.

The three-day conference is dedicated to the science, technology, engineering and application of mask and lithography technologies and associated processes, and gives an overview of the present status in mask and lithography technologies and the future strategy where mask producers and users have the opportunity to become acquainted with new developments and results. This year's sessions include: EUV, Metrology, Data Preparation, Simulation & RET, Resist, Repair & Cleaning, Application, ML2, as well as NIL.

Each year we plan to focus on one lithography and mask technology. This year we have selected two: EUV and ML2. For the second time in its 26-year history the EMLC will take place in Grenoble, France. The VDE/GMM and the EMLC Organizing Committee were again invited to come to Grenoble, France.

We are pleased to report that Geneviève Fioraso, the deputy mayor in charge of economic development of Grenoble, France, provided opening comments.

Our first keynote speaker was Dr. Gérard Matheron, Site Director of STMicroelectronics Advanced Manufacturing Centre in Crolles, France. His presentation was titled, "Silicon ecosystems in Europe: the key to competitiveness."

Our second keynote speaker was Dr. Udo Nothelfer, Vice President and General Manager Fab 1 GLOBALFOUNDRIES, Dresden, Germany. His presentation was titled, "The semiconductor foundry transition and its impact on the mask industry."

Parallel to the full day of conference presentations on Tuesday and Wednesday, a technical exhibition took place where companies (mask suppliers, material suppliers, and equipment suppliers) exhibited their companies and products.

### **Some background information on Grenoble, France**

Grenoble (its historical name was Cularo), was founded in the 3rd century by the Romans. Today it is one of the strongest high tech areas in France and in Europe. Since the year 2000, €4 billion has been invested with €3 billion more to be invested by the end of 2007 for the nano-technology sector in the Grenoble-Isère area. Many high tech companies are located in the region such as: Alliance-Crolles2, CEA-LETI MINATEC, Nanotec 300, Minalogic, Nanosmart Centre (Soitec), etc., STMicroelectronics, NXP Semiconductors (ex-Philips), Freescale Semiconductor, Soitec, Tronic's Microsystems, e2v Semiconductors (ex-Atmel), Synopsys, HP, Mentor Graphics, Maxim, Applied Materials, ASML, KLA-Tencor, Entegris, Air Liquide Electronics Systems, Schneider Electric, MGE UPS Systems, Radiall, Thales, etc. With more than 38,000 jobs in Grenoble-Isère, the information and communication technology (ICT) sector is one of the largest in the area, having enjoyed spectacular growth over the last 15 years. Grenoble-Isère is France's second largest center for research, after the Paris area. It has forged an international reputation in micro- and nano-technology, drawing on powerful, complementary skills in information technology and software. As a result Grenoble-Isère is a key European center for innovation.

### **Some facts of the High Tech companies in the Grenoble area:**

**MINATEC:** A top European center for micro- and nano-technology innovation bringing together training, research and industry. It accounts for 4,000 jobs, 10,000 square meters of clean room space (including CEA-LETI).

**Alliance-Crolles2:** It has a state-of-the-art facility for leading-edge CMOS processes to provide 90nm to 32nm chip technologies on 300 mm wafers. There is strong collaboration between STMicroelectronics, NXP Semiconductors (founded by Philips) and Freescale Semiconductor for the development of high-performance technologies such as System-on-Chip (SoC). Investments of approximately €2.8 billion have been allocated over a five year period.

**Nanosmart Centre - Soitec:** A world-class center of excellence dedicated to advanced materials research in partnership with CEA-LETI, bringing together approximately 100 researchers, and €170 million over a period of five years.

**MINALOGIC:** A world-class competitive center with more than 60 partners that combines semiconductors and software to develop smart miniaturized solutions, and to capitalize on technological progress in industrial sectors to achieve competitive advantages. Over €870 million has been spent or allocated for 16 research projects over a one year period.

**Uwe F.W. Behringer**

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