



NIL INDUSTRIALDAY 2019

... the most essential industry-driven event
for the **NIL** community



March 28-29, 2019

SuperC

at RWTH Aachen University
Germany

Conference Chair: Dr. Michael Hornung, AMO GmbH

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WORDS OF WELCOME TO THE NILINDUSTRIALDAY 2019



Foto: Stadt Aachen

For more than ten years the NILIndustrialday has established itself as the major event in Europe's NanoImprint Lithography community. The fact that the NILIndustrialday steering committee has chosen Aachen to be this year's venue for a leading scientific conference which attracts participants from Europe, Asia and the USA is yet another indication of Aachen's high standing as a place of research and development, and of knowledge sharing.

In hosting this conference and bringing together leading researchers and users of NIL for volume manufacturing, AMO GmbH is pursuing the declared mission to bridge the gap between academic research and industrial application. The very same intention lies at the heart of the campus idea with which RWTH Aachen University and the City of Aachen are currently engaged in creating a unique and highly successful research environment.

I am delighted to welcome the NILIndustrialday 2019 to Aachen, and would like to wish both the organisers and the participants of this event not only a successful and productive conference but also a very pleasant stay in our city.

Marcel Philipp
Lord Mayor of the City of Aachen



Fotograf: Peter Winandy

The importance of excellent research in the innovation process is indisputable. RWTH Aachen University strives for the synchronization of scientific and industrial innovation processes, in order to shorten the innovation cycle. Our scientists conduct comprehensive basic research, followed by application-oriented research in many different disciplines. The NILIndustrialday as an important event for Europe's strong Nanoimprint Lithography community follows this idea by bringing together leading researchers and innovative people from industry.

The NILIndustrialday 2019 provides its attendees a clear understanding of the potential of NIL in the key fields of Life Sciences, Optics & Photonics, 3D Patterning and Mastering as well as global NIL Perspectives defining the future of technology and society.

Choosing Aachen as the conference location hosting RWTH Aachen University, one of Europe's leading institutions in higher education in the field of science and technology, will attract many conference attendees through its unique research environment. I am very happy to welcome you here for the discussion of the latest developments in Nanoimprint Lithography, hope there will be a fruitful exchange between academia and industry, and wish you all a very successful conference!

Univ.-Prof. Dr. rer. nat. Dr. h. c. mult. Ulrich Rüdiger
Rector of RWTH Aachen University

ABOUT NILINDUSTRIALDAY

For the first time the NILIndustrialday took place in 2007 in Berlin as a dissemination action within the European NaPa (<https://cordis.europa.eu/project/rcn/74338/factsheet/en>) and later NaPANIL project (<https://cordis.europa.eu/project/rcn/89316/factsheet/en>). Later the NIL Austria network affiliated this workshop. The NILIndustrialday focuses on research topics based on Nanoimprint Lithography (NIL), which seem suitable for industrial implementation. Due to the great response it was decided to

introduce the NILIndustrialday as a yearly event. The tremendous engagement by Gabi Grützner from micro resist technology GmbH and by Michael Mühlberger from Profactor GmbH led the NILIndustrialday to one of the most important networking events and focus points for Europe's strong NIL community. It supplements scientific conferences, bringing together leading researchers and early adopters by promoting the use of NIL and related technologies as means for volume manufacturing.

CONFERENCE SCOPE

The 2019 edition of the NILIndustrialday will focus on four different topics:

- Life Sciences
- Optics & Photonics
- 3D Patterning and Mastering
- Global NIL Perspective

Within these topics promising opportunities to fully exploit the potential and the strengths of NIL on an industrial scale will be shown. Presentations and informal discussions at NILIndustrialday 2019 will provide its attendees with a clear understanding of the potential of NIL on those four topics and other key fields defining the future of technology and society.

However, the presentations will only be the seed for intense discussions between the attendees of the NILIndustrialday. The true key to success will be the networking in addition to the presentations.

The international symposium will start on Thursday, March 28, 2019 with a walking lunch and networking break and will finish on Friday, March 29, 2019 afternoon. Thursday's conference session will be followed by a sight-seeing tour in the city center of Aachen and a conference dinner at the famous "Altes Kurhaus" in the evening. All sessions will be moderated by Dr. Jose Pozo, Director of Technology and Innovation at EPIC (European Photonics Industry Consortium).

NILINDUSTRIALDAY 2019 (MARCH 28 - 29, 2019)

PROGRAM

March 28th, 2019 - NILIndustrialday (Day 1)

11:00 - 11:30 REGISTRATION / NETWORKING AND EXHIBITION

11:30 - 12:15 LUNCH / NETWORKING AND EXHIBITION

12:15 - 12:30 WELCOME

Prof. Matthias Wessling, Vice-Rector for Research and Structure at RWTH Aachen University

OPENING AND AGENDA

Michael Hornung, AMO GmbH & Gabi Grützner, micro resist technology GmbH

12:30 - 14:20 SESSION I: LIFE SCIENCES

12:30 - 13:00 KEYNOTE PRESENTATION:

EPFL - Institute of Microengineering, Jürgen Brugger

„Micro and nano engineering of fragile materials for solid applications“

13:00 - 13:20 Micronit Microtechnologies B.V., Aliki Tsopele

„Replication techniques in the micro-nano scale for healthcare“

13:20 - 13:40 Profactor GmbH, Michael Haslinger

„Magneto-plasmonic nanoparticles for biomolecular sensing fabricated by UV-NIL“

13:40 - 14:00 Universität Hamburg, Irene Fernandez-Cuesta

„Lab-on-chip devices made of functional, UV imprintable polymers“

14:00 - 14:20 University of Glasgow, Nikolaj Gadegaard

„Unlocking biomedical discovery through volume production of nanopatterned materials“

14:20 - 15:20 COFFEE / NETWORKING AND EXHIBITION

15:20 - 17:00 SESSION II: OPTICS AND PHOTONICS I

15:20 - 15:40 Yole Développement, Amandine Pizzagalli

„NIL equipment trends and opportunities for photonic applications“

15:40 - 16:00 ams AG, Alexander Bietsch

„NIL in mass production - from design to production“

16:00 - 16:20 WaveOptics Ltd., Dion Price

„Unlocking augmented reality: The role of waveguide displays“

16:20 - 16:40 Dispelix Oy, Ismo Vartiainen

„AR displays for smart glasses: Principles, prospects, and challenges“

16:40 - 17:00 Korea University, Heon Lee

„DOE anticounterfeit devices fabricated using NIL“

17:00 - 18:00 DRINKS / NETWORKING AND EXHIBITION

18:30 SIGHTSEEING

(Cathedral's Treasury / Historic Old Town)

20:00 CONFERENCE DINNER

PROGRAM

March 29th, 2019 - NILIndustrialday (Day 2)

08:00 - 08:40 REGISTRATION / EXHIBITION

08:40 - 10:00 SESSION III: OPTICS AND PHOTONICS II

08:40 - 09:00 CSEM - Centre Suisse d'Electronique et de Microtechnique, Rolando Ferrini

„UV imprint lithography of micro & nano structures with a large palette of refractive indexes“

09:00 - 09:20 SCIL Nanoimprint Solutions, Marc Verschuuren

„Functional optical materials and overlay alignment“

09:20 - 09:40 SUSS MicroOptics SA, Reinhard Völkel

„Excellence in microlens imprint lithography and wafer-stacking for optical sensor and lighting applications“

09:40 - 10:00 micro resist technology GmbH, Manuel Thesen

„Reviewing recent case studies“

10:00 - 10:20 EV Group GmbH, Christine Thanner

„NILPhotonics competence center - From idea to success with nanoimprinting“

10:20 - 11:20 COFFEE / EXHIBITION

11:20 - 12:40 SESSION IV: 3D PATTERNING AND MASTERING

11:20 - 11:40 SwissLitho AG, Felix Holzner

„Grayscale mastering down to single nanometer resolution“

11:40 - 12:00 NIL Technology ApS, Niklas Hansson

„Master fabrication with 2.5D and 3D structures for optical applications“

12:00 - 12:20 CEA-LETI, Hubert Teyssedre

„3D shallow profiles for silicon optical elements“

12:20 - 12:40 AMO GmbH, Ulrich Plachetka

„3D shaping of nanopatterns by RIE etching“

12:40 - 13:30 LUNCH / EXHIBITION

13:30 - 14:30 SESSION V: GLOBAL NIL PERSPECTIVE

13:30 - 13:50 A*STAR - Institute of Materials Research and Engineering, Vignesh Suresh

„Sustaining a vibrant nanoimprint ecosystem in Singapore“

13:50 - 14:10 GermanLitho GmbH, Ran Ji

„Nanoimprint technology and market trends in China“

14:10 - 14:30 temicon GmbH/Coatema Coating Machinery GmbH, Oliver Humbach, Thomas Kolbusch

„Upscaling for large area seamless UV-NIL for the Chinese market“

14:30 CLOSING

STEERING COMMITTEE / CONFERENCE CHAIR



Gabi Grützner studied chemistry at the University of Jena. She is the CEO and founder of micro resist technology GmbH and has participated as an innovative personality in several European research projects. Her competences and experiences are a great asset for NIL. She has also received several prizes for her innovation and leadership skills within this area, e.g. the entrepreneur of the year and the OSKAR for medium-sized companies.



Michael Mühlberger is senior scientist in the Functional Surfaces and Nanostructures department at PROFACTOR. He has been working in the field of Nanoimprint Lithography for 15 years and submitted, participated and led several national and international research projects, e.g. the research project cluster NILaustria in the Austrian Nanoinitiative. He holds a Ph.D. in Technical Physics from the Johannes Kepler University Linz.



Michael Hornung is Managing Director at AMO GmbH. Before he joined AMO he was Technical Marketing Manager at SUSS MicroTec Lithography. During his career he also was project manager at CERN in Geneva, working on the inner detector for the ATLAS project. He holds a Ph.D. in Natural Science from the University of Freiburg and an MBA from the University of Applied Sciences of Ludwigsburg.

SESSION CHAIR



Jose Pozo is Director of Technology and Innovation at EPIC and represents 365 companies active in the field of Photonics. He has 20 years' background in photonics technology, market knowledge, and a large network within the industrial and academic photonics landscape. He holds a Ph.D. in electrical engineering from the University of Bristol, U.K., and a M.Sc. and B.Eng. in telecom engineering from UPNA (Spain) / VUB (Belgium). In addition, he has worked as post-doctoral researcher at the Eindhoven University of Technology (The Netherlands), EU proposal coordinator at TNO (The Netherlands), and Sr. Photonics Technology Consultant at PNO Consultants.



EPIC (European Photonics Industry Consortium) is the industry association that promotes the sustainable development of organisations working in the field of photonics. Our members encompass the entire value chain from LED lighting, PV solar energy, Silicon photonics, Optical components, Lasers, Sensors, Displays, Projectors, Optic fiber, and other photonic related technologies. We foster a vibrant photonics ecosystem by maintaining a strong network and acting as a catalyst and facilitator for technological and commercial advancement. EPIC works closely with related industries, universities, and public authorities to build a more competitive photonics industrial sector, capable of both economic and technological growth in a highly competitive world-wide marketplace. www.epic-assoc.com

SPEAKER



Jürgen Brugger is Professor at the Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland in Microengineering and Materials Science. Before joining EPFL he was at the MESA Research Institute of Nanotechnology at the University of Twente in the Netherlands, at the IBM Zurich Research Laboratory, and at the Hitachi Central Research Laboratory, in Tokyo, Japan. He received his Master in Physical-Electronics and his Ph.D. degree from Neuchatel University, Switzerland.



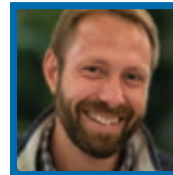
Alik Tsopele is an R&D Project Manager at Micronit Microtechnologies, working on the development of microfluidic devices targeting applications in the Biomedical and Life Science Research fields.



Michael Haslinger is a Ph.D. student at PROFACTOR GmbH (Austria). His research is focused on NIL for nanoparticle fabrication and imprinting on free-form surfaces e.g. AR Moth-Eyes.



Irene Fernandez-Cuesta is currently leading a group in CHyN (Uni Hamburg) with an ERC grant. She uses micro and nanotechnologies (like NIL) to make integrated devices for single molecule detection.



Nikolaj Gadegaard is a full professor of Biomedical Engineering and the Director of Research in the School of Engineering at the University of Glasgow. He currently holds an ERC consolidator award and is an international PI on a Centre for Excellence.



Amandine Pizzagalli is a Technology & Market Analyst, Equipment & Materials - Semiconductor Manufacturing, at Yole Développement (Yole). She is deeply involved in the development of the Semiconductor & Software division with the production of reports and custom consulting projects dedicated to the semiconductor equipment and materials industries and related manufacturing processes.



Alexander Bietsch is working at AMS in Rüschlikon, Switzerland as a Manager of the Mastering team, which is responsible for providing wafer-level optical masters to produce millions of optical components in Singapore.



Dion Price is a high-tech industry professional currently working in the Augmented Reality space throughout the US west coast, Asia and Europe. Prior to this Dion spent 17 years in Mobile operator, digital transformation, start up, hardware manufacturer and consulting environments. Although a native of the UK, previous roles have resulted in international relocation to the US and Australia as well as several mid term secondments to central Europe, Latin America and Russia.



Ismo Vartiainen graduated as a Ph.D. from the University of Eastern Finland. After three years in Switzerland, he re-joined the University of Eastern Finland receiving an Adjunct Professor title. In 2016 he joined Dispelix leading the R&D manufacturing team as a Principal Manufacturing Engineer.



Heon Lee studied metallurgical engineering at Seoul National University. He holds a Ph.D. in materials science and engineering from Stanford University. Presently he is Professor at Korea University Department Of Materials Science and Engineering.



Rolando Ferrini joined CSEM in 2011 as Project Manager and, since 2012, he is Head of the MicroNano Optics & Photonics (formerly, Integrated Light Management) Section at CSEM Muttenez.



Marc A. Verschuuren invented the SCIL technology and started the Philips venture SCIL Nanoimprint solutions in 2015, developing SCIL based volume production solutions. Currently he is responsible for new materials, processes and production hardware and works with customers to obtain a seamless integration of SCIL in new or existing production flows.



Reinhard Völkel studied Physics at the University of Erlangen-Nürnberg, where he received his Ph.D. in 1994. In 1999 he co-founded SUSS MicroOptics SA where he serves as CEO since then. He is member of DGaO, SSOM, EOS, OSA, SPIE Fellow, committee member of Swissmem Photonics and expert for Innosuisse.



Manuel Thesen is Product Manager for Nanoimprint Materials at micro resist technology GmbH since 2013. After his Ph.D. in Colloid and Polymer Chemistry which he has received from the University in Potsdam in close cooperation to the Fraunhofer Institute for Applied Polymer Research working on the synthesis of polymers for OLED applications, he has joined the company as R&D scientist working in industrially driven projects with the focus on the next generation materials for NIL.



Christine Thanner has a scientist position at EV Group headquarters in St. Florian, Austria with focus on Nanoimprint lithography development. She graduated from the Fachhochschule München and worked for Siemens and Infineon before joining EV Group almost 20 years ago. Her current work takes advantage of the experience of almost 15 years developing nano imprint lithography as a Senior Process Technology Engineer.



Felix Holzner is a physicist by training with university degrees from Germany and New Zealand and a Ph.D. from ETH Zurich. He worked on the NanoFrazor technology at IBM Research Zurich for three years, before he initiated and advanced its commercialization with the incorporation of SwissLitho in 2012 and the integration into Heidelberg Instruments in 2018. He leads SwissLitho as CEO.



Niklas Hansson, Senior Scientific Executive at NIL Technology, holds a M.Sc. in Physics from Chalmers University and has 13 years of experience from development of blazed and slanted gratings and diffractive optics.



Hubert Teyssedre received his Ph.D. in material science and polymer material for nano-fabrication in 2013. Since 2017 he is managing the nanoimprint activities at CEA LETI.



Ulrich Plachetka holds a Master of Science in communications engineering and regenerative energy systems. He received a doctor's degree from the RWTH Aachen in engineering, working especially in the field of nano-patterning. He is currently head of AMO's sensor technology.



Vignesh Suresh investigates and leads efforts in nanopatterning and fabrication domain at IMRE, Singapore. He manages NIL foundry at IMRE and devices key strategies to position foundry as the one-stop shop for nanomanufacturing.



Ran Ji holds a Ph.D. degree in Material Science from Halle University. He has 20 years' experience in micro and nanofabrication, especially Nanoimprint technologies. He is founder and CEO of GermanLitho GmbH.



Oliver Humbach studied physics at the universities of Münster and holds a Ph.D. from the university of Duisburg-Essen. Presently he is CEO and Shareholder of temicon GmbH, Micro and Nano structured Tools and components, industrial production, innovative, strong growth, R&D, international sales and marketing, unique selling proposition.



Thomas Kolbusch is Vice President at Coatema Coating Machinery GmbH. He does research in Marketing and Manufacturing Engineering. Their current project is 'Fuel Cells'.

EXHIBITORS



AMO's strategy is to close the gap between basic research and industrial application. Under the management of Prof. Dr. Lemme, the company has a state-of-the-art 400 m² clean room at its disposal for this purpose. The focus is on the identification of new potentials in the field of nanotechnology for various applications in information technology, biotechnology, photonics and sensor technology. The special strengths lie in lithography, structure transfer and a highly qualified research team with many years of experience in process technology and application. In addition to providing the R&D infrastructure, AMO offers consulting services, prototype development and the production of nanostructures. www.amo.de



Coatema offers a full range of coating, printing and laminating equipment and R&D services. Coatema is part of the ATH Group in Hamburg and has been operating for over 40 years in markets like textiles, renewables, membranes, medical, pharmaceutical, prepreg, fuel cells and printed electronics. The company vision is Lab2Fab and over the years Coatema very much specialized in high tech niche markets. One of these markets is Nanoimprint Lithography (NIL) technologies, Coatema is active here with its brand TEMICOAT which is jointly owned and operated by Coatema and Temicon. A focus on high tech markets, world class service support and one of the most versatile R&D centre in the world for coating, printing and laminating enables Coatema to offer complete laboratory to fabrication (Lab-to-Fab) technologies. www.coatema.de



EASYTEC is a worldwide technology leader in industrial drying and curing of polymerisable coatings such as UV lacquers, paint, and adhesives by means of UV-LED technology. EASYTEC's innovative UV-LED systems are distinguished by highest energy efficiency and versatility. EASYTEC's High Power UV LED Systems are the highest performing UV LED radiators worldwide. They emit a hitherto unachieved top-class optical radiation and they do so with all available wavelengths from 365 nm up to 410 nm wavelength (peak). www.easytecgbh.de



EV Group (EVG) is a leading supplier of equipment and process solutions for the manufacture of semiconductors, microelectromechanical systems (MEMS), compound semiconductors, power devices, and nanotechnology devices. Key products include wafer bonding, thin-wafer processing, lithography/nanoimprint lithography (NIL) and metrology equipment, as well as photoresist coaters, cleaners and inspection systems. Founded in 1980, EV Group services and supports an elaborate network of global customers and partners all over the world. www.evgroup.com



GermanLitho is a leading supplier of equipment and process solutions for micro- and nanostructuring applications. We specialize in nanopatterning and NanoImprint Lithography (NIL) technologies. GermanLitho's core competence is to offer total solutions of nanoimprint to our customers. Our portfolio covers from equipments, masters/stamps, consumable materials, consultancy to production service based on nanoimprint. We are expanding the use of nanoimprint technologies for innovative products within various applications such as LED-, MEMs/NEMs-, AR/VR-, 3D Sensing-, Bio Chips-, Displays and solar cells industries, etc. GermanLitho is committed to being the innovation leader to solve the world's toughest nanostructuring challenges. This vision helps to solve high-value problems and enables our customers to successfully commercialize their production ideas. www.germanlitho.com



Himax IGI designs & manufactures innovative micro & nano patterns for displays, optics, telecommunications, biomedical, & other applications. NanoSculpt technologies are used to make photoresist masters, nickel shims, & soft molds with diverse pattern characteristics that create the desired surface or optical properties. Products made by Himax IGI are used in Nanoimprint lithography, injection molding, roll-to-roll, embossing, stamping, & other prototype and high volume manufacturing processes. www.himax.com.tw



ims chips was founded in 1983 as a foundation of the Federal State Baden-Wuerttemberg with the original purpose to support industrial and academic partner with microelectronic devices. Today we have additional competencies in areas like Replication Master, MEMS, Diffractive Optics and Silicon Photonics. First of all we do research and development and in particular cases we fabricate the developed components or devices. Because of an increasing demand for our products we founded a spin-off 6 years ago, called IMS Micro-Nano Products for running commercial orders with a higher volume. We operate certified wafer and mask lines in a 1200m² clean room class ISO 4 and currently 100 employees are working for IMS. www.ims-chips.de



JOANNEUM RESEARCH is a business oriented leader of innovation and technology providers. With focusing on applied research and technology development, the INNOVATION COMPANY plays a key role in transferring technology and know-how in Styria. Our MATERIALS institute focuses primarily on micro- and nanotechnology, surface functionalization, materials science, sensors und laser-production technologies. The Institute's Research Group for Hybrid Electronics and Patterning has more than 10 years of experience in the development of manufacturing processes for optical, optoelectronic and electronic components. Its expertise in design, fabrication, characterization and optimisation, combined with the new pilot plant provide a sound basis for the development of industrial processes. www.joanneum.at



micro resist technology is a leading company for the development and production of innovative photoresists, special polymers as well as ancillaries for micro- and nanolithography and micro-optical applications. Our products are applied in key technologies like microsystems technologies, microelectronics, micro and nano photonics, micro and nano engineering as well as in Life Sciences. Our worldwide customers are innovative manufacturing companies whose value creation is significantly based on micro and nano fabrication. Furthermore, leading research institutes and top level universities are our clients which we support already in the early phase of their technology development. All our customers appreciate our expertise for photoresists, polymers, photo polymers as well as our comprehensive technological consultations with a holistic view on the lithographic interaction between material and processes. It is our aim to have satisfied and enthusiastic customers who are successful with their individual processes. As a reliable and experienced partner we also offer product-supporting lithographic services. www.microresist.de



morphotonics is the leading supplier of Roll-to-Plate Nanoimprint equipment, stamps and materials. Through its unique nanoimprint technology, micro- and nanostructures can be applied on very large areas (up to and beyond 2 m²) in high volume at an unparalleled low cost. This opens up the potential of nanoimprinting for innovative features and functions in, for example, displays, smartphones, lighting products or solar panels. The reusable flexible stamp ensures a cost-effective and versatile process that can be applied on various types of substrates (rigid/flexible/opaque). Within its competence centre, Morphotonics offers to scale-up your master, optimize processes and facilitate low-volume production. Morphotonics supports you in bringing your nanoimprint application from lab to fab! www.morphotonics.com



PROFACTOR conducts applied production research focusing on two topics: INDUSTRIAL ASSISTIVE SYSTEMS and ADDITIVE MICRO/NANO-MANUFACTURING. PROFACTOR has years of experience in process development and in understanding materials and their properties in Nanoimprint Lithography and Inkjet Printing processes. Both – Nanoimprinting and Inkjet Printing – are performed on large areas as well as on freeform surfaces. www.profactor.at



RAITH is a world leading manufacturer of nanofabrication instrumentation with over 35 years of experience and an international service and support structure. RAITH supplies the best solutions for nanofabrication, electron beam lithography, focused ion beam nanofabrication, and nanoengineering. Be at the top of the game with the best future-proof RAITH solution for advanced template fabrication for NIL. www.raith.com



SCIL Nanoimprint solutions offers solutions for patterning nano-structures on large wafers by using its unique and proprietary lithography technology (SCIL). SCIL or Substrate Conformal Imprint Lithography is a cost effective, robust, high yield process enabling nanometer resolution patterns on a large variety of materials. SCIL delivers proven, high quality imprints on wafer areas up to 200 mm. It can be used to make patterns with feature sizes down to less than 10 nm and overlay alignment down to 1 μm . SCIL Nanoimprint Solutions helps customers with optimised equipment, consumable materials and processes for high volume production. Our solutions enable manufacturers of optics and photonic products to increase performance, lower end-product costs and increase functionality. www.ip.philips.com/data/static/scil/index.php



SÜSS MicroTec is a leading supplier of equipment and process solutions for microstructuring in the semiconductor industry and related markets. In close cooperation with research institutes and industry partners SUSS MicroTec contributes to the advancement of next-generation technologies such as 3D Integration and nanoimprint lithography as well as key processes for MEMS and LED manufacturing. With a global infrastructure for applications and service SUSS MicroTec supports more than 8.000 installed systems worldwide. SUSS MicroTec is headquartered in Garching near Munich, Germany. www.suss.com



SwissLitho and HEIDELBERG INSTRUMENTS joined forces in early 2018. Together, they offer the widest range of direct write micro- and nanolithography systems in the world, from low-cost desktop solutions to high-end writers for substrates larger than 1m. Their products are used for prototyping in R&D, industrial manufacturing, and academic research. A full wafer can be patterned in a few minutes with sub-um resolution, making mask aligners obsolete. Single-nm resolution with simultaneous pattern inspection is achieved with the unique NanoFrazor technology. Systems from both companies can be used to obtain micro- and nanostructures with high aspect ratio as well as in grayscale mode, which makes them particularly suitable to create templates for NIL applications. www.swisslitho.com



temicon is leading manufacturer of micro- and nano structured components and functional surfaces. Typical applications are in the field of automotive, lighting and life science. For these industries temicon provides microstructured injection molding inserts e.g. for MLA, titer plates or optical components for automotive lighting. Furthermore temicon offers injection molding service to our customers. www.temicon.com

CONFERENCE LOCATION

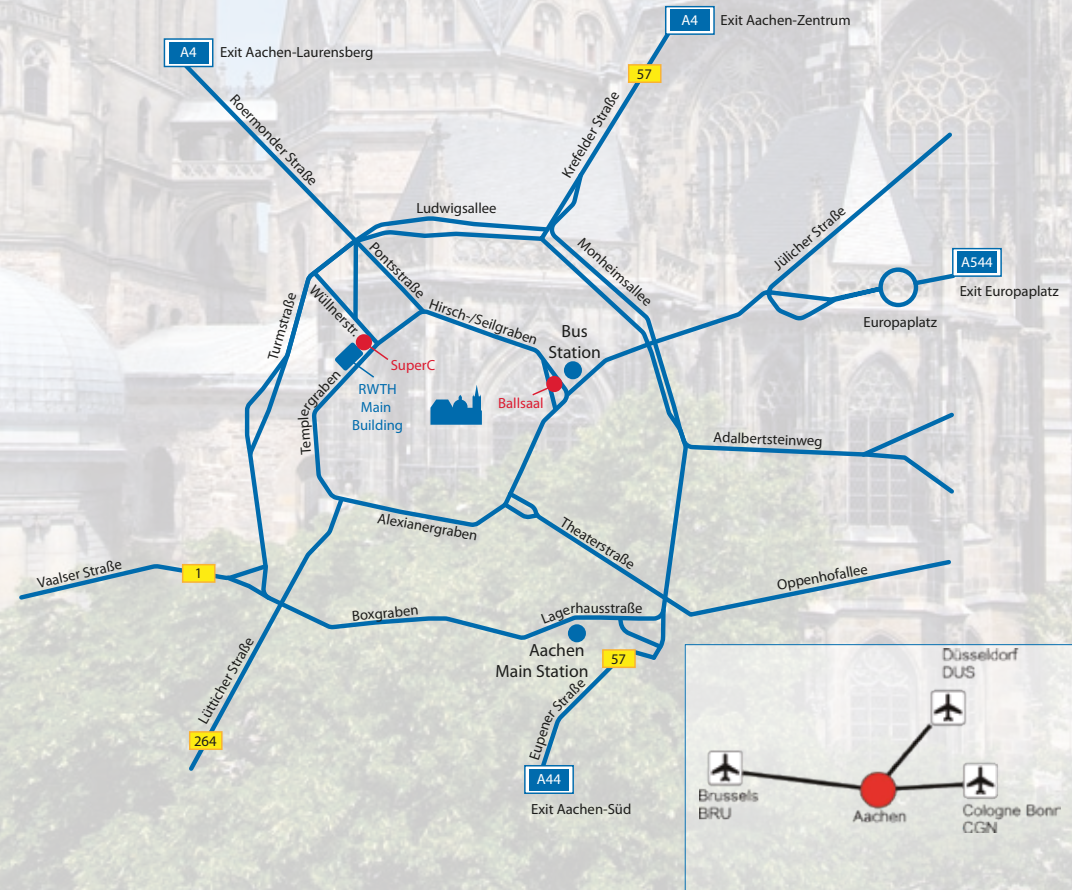


SuperC @ RWTH Aachen University
Templergraben 57
52062 Aachen
Germany

CONFERENCE DINNER



Ballsaal @ Altes Kurhaus
Komphausbadstr. 19
52062 Aachen
Germany



NIL INDUSTRIALDAY 2019

Conference Chair:	Michael Hornung Phone: e-mail:	AMO GmbH +49 (0) 241 88 67 200 hornung@amo.de
Session Chair:	Jose Pozo	EPIC
Steering Committee:	Gabi Grützner Michael Mühlberger	micro resist technology GmbH Profactor GmbH
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