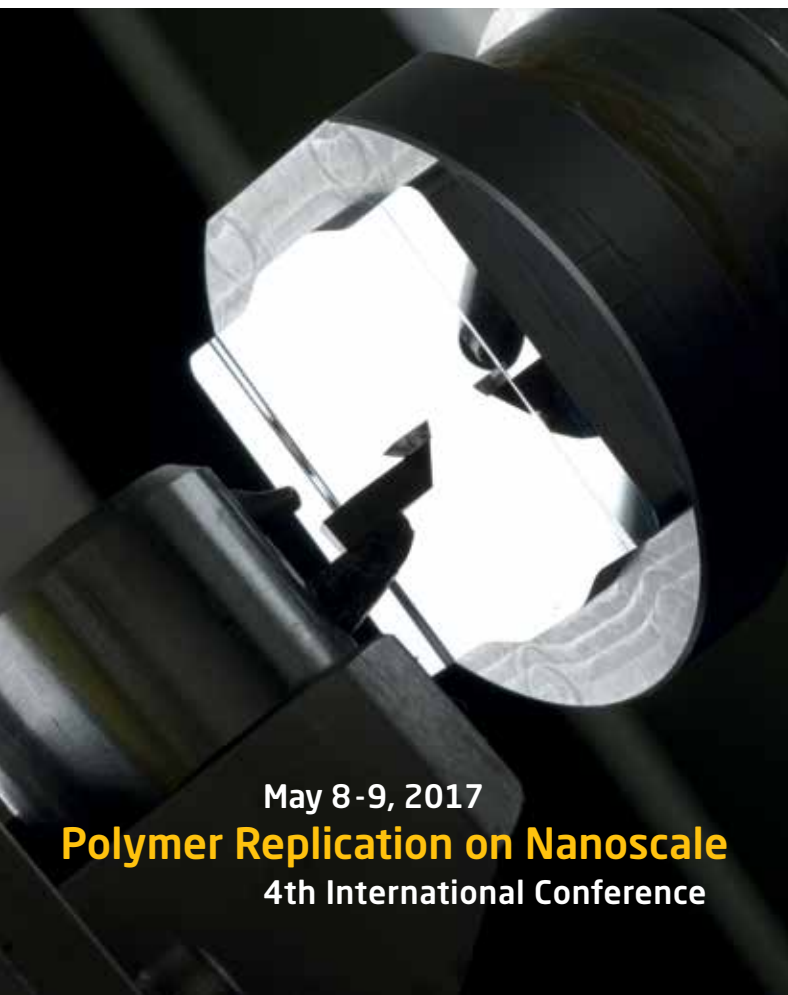


**PRN**  
**2017**

# Polymer Replication on Nanoscale



May 8-9, 2017

**Polymer Replication on Nanoscale**  
**4th International Conference**

## SCOPE OF THE CONFERENCE

The conference will address issues in large scale replication of nanostructures in polymeric materials including

- Fabrication of molds or shims for injection molding.
- Injection molding, extrusion or other related methods.
- Polymers suitable for injection molding of nanostructures.
- Applications for functional micro- and nanostructured polymeric surfaces.
- Characterization of injection molded nanostructures.

### The conference is hosted by

The first International Conference on Polymer Replication on Nanoscale (PRN) conference was held in 2014 as part of the Nanoplast project, an advanced technology platform which develops methods for injection molding of plastic parts with functional nanostructured surfaces. This year, the 4th PRN conference will be hosted by the Fraunhofer Institute for Production Technology IPT with support from the Technical University of Denmark (DTU).



[www.prn-conference.com](http://www.prn-conference.com)



### The conference is organized by the Fraunhofer Institute for Production Technology IPT

The aim of the Fraunhofer IPT is to develop new and optimize existing solutions through practice-oriented research and development. The Fraunhofer IPT transfers these R&D results directly into practice in client companies, which come from a wide range of industries, such as the automotive industries and its suppliers, especially tool and die making, as well as fine mechanics and optics industries, aerospace industries, and machine tool manufacturers.

### Organizing Committee

Christoph Baum, Thomas Bastuck, Lisa Behnken, Helen Kolb and Anna Luthin, Fraunhofer Institute for Production Technology IPT, Germany

### Contact

Fraunhofer Institute for Production Technology IPT  
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Steinbachstrasse 17  
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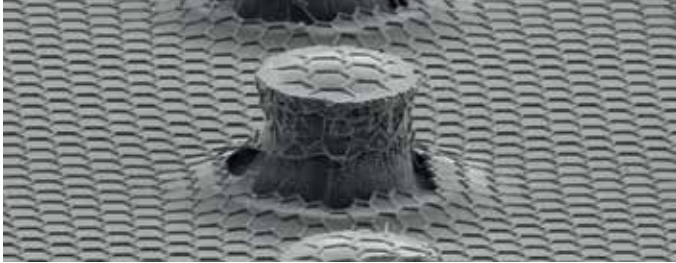
[prn@ipt.fraunhofer.de](mailto:prn@ipt.fraunhofer.de)  
Phone: +49 241 8904329  
Fax: +49 241 8904 -6166



Hydrophobic surfaces (DTU, Denmark)



Holographic safety labels (DTU, Denmark)



Hierachical nanostructures (ICN2, Spain)



Cell growth enhancing nanostructures (Fraunhofer IPT, Germany)

# Polymer Replication on Nanoscale 4th International Conference

## Venue

Laboratory for Machine Tools and Production Engineering (WZL)  
 Manfred-Weck-Haus  
 Steinbachstrasse 19  
 52074 Aachen  
 Germany



## May 8-9, 2017

The programme will consist of invited and contributed oral presentations, and a small poster session.

## About polymer replication on nanoscale

The industry prefers methods for low-cost mass production of polymeric parts with a high level of throughput and reproducibility, e.g. injection molding or roll-to-roll processing. However, these methods have not been regarded as scientific tools due to the high-cost master tools. The aim of the conference is to meet the industrial needs to enable functional nanostructured surfaces of commercial injection molds, extruded or roll-to-roll replicated products.

The challenge is to transfer the low-volume/ lab-scale fabrication of micro- and nanostructures, created by state-of-the-art equipment at university level, to industrial injection molding, extrusion and continuous replication processes.

## Registration

Please send your registration to [prn@ipt.fraunhofer.de](mailto:prn@ipt.fraunhofer.de) or via fax to +49 241 8904 -6166.

The registration fee includes access to all sessions during both days of the PRN2017, conference proceedings booklet, lunch, coffee breaks and refreshments as well as the conference dinner.  
 Early bird registration, before April 7, 2017 300 EUR  
 Late registration, after April 8, 2017 400 EUR

This includes 360€; and 260€; for the conference (tax-free according to §4 UStG) as well as 40€; (including 19% VAT) for the attendance of the evening event. Please note that the conference attendance can only be booked together with the evening event.

Name\* \_\_\_\_\_

First Name\* \_\_\_\_\_

Title \_\_\_\_\_

Institution/Company\* \_\_\_\_\_

Position \_\_\_\_\_

Department \_\_\_\_\_

Street Adress/P.O. Box\* \_\_\_\_\_

City/Zip-Code/Country\* \_\_\_\_\_

Phone\* \_\_\_\_\_

Fax\* \_\_\_\_\_

E-Mail\* \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

\*Data necessary

I agree that my name and address will be registered in the list of participants. For the purpose of organizing the seminar, name and address will be electronically processed and saved.

# Program

## May 8, 2017

12:00 Lunch

**13:00 Welcome to the Conference Polymer Replication on Nanoscale 2017**

Christoph Baum, Fraunhofer IPT, Germany

### Session 1: Materials, Mastering, Tooling

**13:15 Manufacturing of shims for micro-fluidics**

René Sanders, Philips Innovation Services, Netherlands

**13:35 3D Laser direct writing based mold fabrication for the manufacturing of diffractive-refractive elements**

Marcel Röder, Hahn-Schickard-Gesellschaft für angewandte Forschung e.V., Germany

**13:55 Sustainable processing for enhanced adoption of thermo plastic composite**

Veronica Savu, Morphotonic S.à.r.l., Switzerland

**14:15 Production of individual optical and biological micro-structures with two-photon polymerization**

Emely Harnisch, Fraunhofer IPT, Germany

14:35 Networking/ Coffee break

### Session 2: Nanoimprint Lithography

**15:05 Stamps fabrication for topography-based polymeric functional surfaces**

Santos Merino, IK4-TEKNIKER, Spain

**15:25 Dynamic surfaces: utilizing nanoimprint lithography for tailored functional plastic surfaces**

Nikos Kehagias, Catalan Institute of Nanoscience and Nanotechnology, Spain

**15:45 From laser litho mastering to roll-to-roll UV-NIL manufacturing of  $\mu$ -fluidic devices**

Dieter Nees, JOANNEUM RESEARCH Forschungsgesellschaft mbH, Austria

16:05 Tour of test facilities at Fraunhofer IPT

17:30 Poster session, Networking

19:30 Networking-Dinner

# Program

## May 9, 2017

### Session 3: Applied Nanostructures

- 9:00    **Replication of two-sided optical micro- and nano-structures with high accuracy**  
Christian Rytka, Fachhochschule Nordwestschweiz, Switzerland
- 9:20    **Pilots for production of surface nano-structured antimicrobial and anti-biofilm materials**  
Tzanko Tzanov, UPC Universitat Politècnica de Catalunya, Spain
- 9:40    **High aspect ratio micro- and nanostructures for low reflection Fresnel lenses**  
Christian Steinberg, University of Wuppertal, Germany
- 10:00    Networking/ Coffee break
- 10:30    **Replication and analysis of polymer micro structured functional surfaces for contrast generation**  
Francesco Regi, DTU, Denmark
- 10:50    **NanoPack: Antimicrobial polymeric nanocomposites for food packaging**  
Ester Segal, Technion - Israel Institute of Technology, Israel

### Session 4: Injection Moulding

- 11:10    **Replication of micro- and submicrometric patterns fabricated with femtosecond laser via industrial injection molding for light scattering surfaces**  
S.M. Olaizola, CEIT-IK4 & Tecnun, Spain

- 11:30    **Influence of mould temperature - is nanoinjection molding a glorified version of nanoimprint lithography?**  
M.S.M. Saifullah, A\*STAR, Singapore
- 11:50    **Injection moulding of nano-functionalized surfaces enabled by nanoimprint**  
Theodor Nielsen, NIL Technology ApS, Denmark
- 12:10    **Micro injection molding of 3D printed micro needles**  
Michael Haslinger, Profactor GmbH, Austria

12:30    Lunch

### Session 5: Novel Approaches

- 13:30    **Superhydrophobic plastic lenses - layout generation, mastering, mold fabrication, polymer replication & structure characterization**  
Markus Guttman, KIT, Germany
- 13:50    **One-step fabrication of hierarchical structures by direct laser writing through PDMS molds**  
Maximilian Rumler, Universität Erlangen-Nürnberg, Germany
- 14:10    Networking/ Coffee break
- 14:40    **Manufacture of optical micro-structures in plastics components through a multi-technology approach**  
Magnus Orth, RWTH Aachen, Germany
- 15:00    **Replication of nanostructures in PMMA using block - copolymer in situ nanolithography**  
Agnieszka Telecka, DTU, Denmark
- 15:20    **Simulations of Pattern replication during Extrusion coating process**  
Nastasia Okulova, DTU, Denmark