

# NNT 2016

September, 26-28 | Braga, Portugal  
// [www.nntconf.org](http://www.nntconf.org)

## PROGRAMME

Organizer



Sponsors



Exhibitors



# Monday, September 26

9:00 Exhibitors Set-up

14:00 Registration

17:00 Poster Session + Exhibition

18:30 WELCOME RECEPTION

# Tuesday, September 27

## 09:00 OPENING SESSION

09:30 **Lars Montelius** - Conference Chair  
**Helmut Schiff** - Programme chair  
**Gabi Grützner** - Technical Exhibition Chair

## SESSION 1 - EMERGING INNOVATION

9:30 **KEYNOTE 1: Planar photonics with metasurfaces**  
**Antonio Ambrosio**, Harvard University, USA

10:00 **KEYNOTE 2: Microneedle pads**  
10:30 **Russel F. Ross**, Kimberly-Clark, USA

10:30  
11:00 **COFFEE BREAK**

## SESSION 2 - STAMPS, PROCESSES, MATERIALS FOR NANOFABRICATION

11:00 **TUTORIAL 1: The role of geometry parameters in nanoimprint**  
**Hella-Christin Scheer**, University of Wuppertal, Germany

11:40 **Full relief thermal nanoimprint in the glass transition region via small amplitude oscillatory shear**  
**Owen Brazil**, Trinity College Dublin, Ireland

11:55 **Fabrication of nano structures on flexible substrate by roll-based liquid transfer imprints lithography process**  
**Jaejong Lee**, Korea Institute of Machinery and Materials, South Korea

12:10 **Towards seamless stitching: a novel UV-NIL based recombination approach for the upscaling of high resolution nanostructures**  
**Florian Schlachter**, AMO, Germany

12:25 **UV-based Nanoimprint Lithography of T-shaped Nanostructures**  
**Michael Mühlberger**, Profactor, Austria

12:40 **Impact of mold stiffness for peeling release in nanoimprint**  
**Yoshihiko Hirai**, Osaka Prefecture University, Japan

13:00  
14:30 **LUNCH**

## SESSION 3 - APPLICATIONS 1

14:30 **TUTORIAL 2: Nanoimprint Technology**

15:10 **and Structured Surfaces for Life Sciences**

**Stella Pang**, City University of Hong Kong, China

15:10 **Detection of human stress hormone**

15:25 **(human salivary cortisol) via nanoimprinted multi-scale protein sensor by label-free method**

**Jinhyung Lee**, Yonsei University, South Korea

15:25 **Nano patterning of anchoring**

15:40 **biomolecules for DNA study**

**Jean-Christoph Cau**, Innopsys, France

15:40

**COFFEE BREAK**

16:00

## SESSION 4 - POSTER SESSION

16:00 **Elevator session before the poster**

16:45 **session**

### PROCESSES

**Influence of thermal nanoimprint parameters on the Young's modulus of PMMA**

**Michele Pianigiani**, Paul Scherrer Institut, Switzerland

**Complex 3D structures via repeated hybrid imprint and sacrificial layer techniques**

**Marc Papenheim**, University of Wuppertal, Germany

**Imprint strategies for directed self-assembly of block copolymers**

**Si Wang**, University of Wuppertal, Germany

**Simplified double nanoimprint-graphoepitaxy using L&S and flat pattern molds**

**Makoto Okada**, University of Hyogo, Japan

**UV-NIL of a water-soluble resist for nano-patterning of proteins**

**Marco Lindner**, STRATEC Consumables, Austria

**Soft UV-NIL process characterization using nondestructive, on-wafer scatterometry technique**

**Jumana Boussef and Cecile Gourgon**, CNRS, France

### STAMPS AND TOOLS

**High resolution printed patterning by using 250mm wide seamless roller mold (SRM) with sub-micron pattern**

**Kenjiro Okuno**, Asahi Kasei Corporation, Japan

**Quantification and reduction of deformations in multilayer soft-NIL stamps**

**Michael Förthner**, University Erlangen-Nuremberg, Germany

**Performance of anti-adhesion multi-layer coated Ni stamp for thermal imprint lithography**

**Young Bo Shim**, Pusan national university, South Korea

### APPLICATIONS

**Broad-band three dimensional nanocave ZnO thin film photodetectors enhanced by Au surface plasmon resonance**

**Dongdong Li**, Chinese Academy of Sciences, China

**Plasmonic nanostructures with 20 nm gaps fabricated by UV-NIL and lift-off processes**

**Takuya Uehara**, Lawrence Berkeley National Laboratory, USA

**Memristive device scaling and integration**

**Qiangfei Xia**, University of Massachusetts Amherst, USA

**Atomic layer etching in nanoimprint stamp technology**

**Ivan Maximov**, Lund University, Sweden

16:45 **Poster session (Lobby)**

18:15

### PROCESSES

**Polymerization shrinkage and the replication fidelity of batch- and R2R-UV-NIL**

**Johannes Götz**, JOANNEUM RESEARCH, Austria

**Computational study on induced strain for molecular ordering in direct nanoimprint**

**Yoshihiko Hirai**, Osaka Pref. University, Japan

**Computational study of induced stress dependence on the resist choice in nanoimprint lithography**

**Yoshihiko Hirai**, Osaka Pref. University, Japan

**Direct nanoimprinting on curved objects**

**Jumiati Wu** and **Hong Yee Low**, Singapore University of Technology and Design, Singapore

**Study on P2P UV imprint lithography using an optically opaque electroforming stamper**

**Kwang Kim**, Korea Polytechnic University, South Korea

**Metal nano-pattern fabrication by applying a soft UV-NIL resist onto a neutral developable lift-off layer**

**Michael Haslinger**, Profactor, Austria

**Computational study of materials choice on mold replication in nanoimprint lithography**

**Yoshihiko Hirai**, Osaka Pref. University, Japan

**Surface-confined unwrinkling for super-smooth microstructure**

**Helmut Schiff**, Paul Scherrer Institut, Switzerland



**STAMPS AND TOOLS**



**Flat and highly flexible composite stamps for nanoimprint, their preparation and their limits**

**Marc Papenheim**, University of Wuppertal, Germany

**Stability of flexible composite stamps with thermal nanoimprint**

**Marc Papenheim**, University of Wuppertal, Germany

**Direct laser interference patterning of Nickel molds/sleeves used for thermal plate-to-plate and roll-to-roll nanoimprint lithography**

**Andreas Rank**, TU Dresden, Germany

**Inkjet-printing of working stamp materials for UV-based nanoimprint lithography**

**Michael Mühlberger**, Profactor, Austria

**Superhydrophobic nanoimprinted structures with enhanced durability**

**Jaime J. Hernández**, **Iván Navarro** and **Isabel Rodríguez**, IMDEA Nanoscience, Spain

**Development of highly uniform nanoporous anodic aluminum oxide roll molds for mass-production of anti-reflective and superhydrophobic surfaces**

**Dae-Yeong Jeong**, Korea Electrotechnology Research Institute, South Korea

**Low cost and large area fabrication of nanoimprint templates with tunable feature sizes**

**Shuhao Si**, Technische Universität Ilmenau, Germany

**Determination of stamp deformation during imprinting on semi-spherical surfaces**

**Jan Kafka**, Inmold, Denmark



**APPLICATIONS**



**Roll-to-plate UV-nanoimprinting for micro and nano-optics**

**Michael Mühlberger**, Profactor, Austria

**Nanoimprint-based Ag transfer and its reconfiguration for enhanced plasmonic property**

**Eung-sug Lee**, Korea Institute of Machinery and Materials, South Korea

**Enhanced light extraction efficiency in organic light emitting diodes using functional random pattern**

**Yang Doo Kim**, Korea university, South Korea

**Roll-to-roll prepared flexible antireflection film with microstructure for photovoltaic applications**

**Min Wang**, Chinese Academy of Sciences, China

**Nanostructured photo-electrode for solar energy conversion**

**Heon Lee**, Korea University, South Korea

***Nanoimprinted flexible polymer foil:  
impact of surface potential on  
icephobic properties***

**Nathalie Frolet**, CNRS, France

***Fabrication of large superhydrophobic  
surfaces with hierarchical structures  
on polymer films using NIL and plasma  
roughening***

**Jerome Durret**, CNRS, France

***Curvature compensation for iridescent  
colors***

**Gideon P. Caringal**, Inmold, Denmark

***Effects of pinning on water droplet  
rolling on nano-patterned surface***

**Won Kyoung Cho**, Pusan National  
University, South Korea

***Enhanced performance of anti-  
reflective films with double-sided  
nanostructures***

**Ji Suk Kang**, Pusan National University,  
South Korea

***Regulating mesenchymal stem cell  
phenotype and morphology via  
biomimetic nanopatterned surfaces***

**Owen Brazil**, Trinity College Dublin,  
Ireland



NEW PROCESSES



**Platform for the automated contact  
printing and nano-imprint lithography  
process**

**Steffen Howitz**, GeSiM, Germany

***Could nanoimprinting and additive  
manufacturing be an interesting  
combination?***

**Michael Haslinger**, Profactor, Austria

***Solution approach for successful NIL***

**Marc Verschuuren**, Philips Group  
Innovation, The Netherlands

***Examination of depth profile of  
molecular orientation in L&S pattern  
fabricated by nanoimprint-  
graphoepitaxy***

**Makoto Okada**, University of  
Hyogo, Japan

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18:15

18:30

**BREAK**

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18:30 **Conference Dinner** in Porto,

23:30 (Transfer 18:30, Tour 19:00-20:00,  
Back: 23:00)

# Wednesday, September 28

## SESSION 5 - INDUSTRIAL

9:00 **Introduction**

9:05 **Stephen Y. Chou**, Princeton University, USA

9:05 **INVITED: Jet and flash imprint lithography material and tool development for high throughput semiconductor memory**

**Jin Choi**, Canon Nanotechnologies, USA

9:25 **INVITED: Assessment of the HERCULES platform through metrology, defectivity and overlay analysis**

**Stefan Landis**, CEA-LETI, France

9:40 **INVITED: SCIL high volume tooling - first experiences**

**Marc Verschuuren**, Philips Group Innovation, The Netherlands

10:00 **PANEL DISCUSSION**

10:30 Jin Choi (Canon),  
Marc Verschuuren (Philips),  
Russell Ross (Kimberly Clark),  
Babak Heidari (Obducat),  
Thomas Glinsner (EVG),  
Stephen Y. Chou (Princeton University)  
Gabi Grützner (coordinator)

10:30  
11:00

**COFFEE BREAK**

## SESSION 6 - APPLICATIONS 2

11:00 **INVITED: NIL applications for structural colors**

**Anders Kristensen**, Technical University of Denmark, Denmark

11:45 **Industrial-scale production of nano- and microstructured polymer foils for low-cost concentrated solar power**

**Maria Matschuk**, Heliac, Denmark

12:00 **Advancing manufacturing route for multi-level DOEs**

**Loic Jacot-Descombes**, micro resist technology, Germany

12:15 **Electrohydrodynamic-NIL on flexible polymers for new solar cells**

**Cecile Gourgon**, CNRS, France

12:30 **Interlocked interfaces for high-performance triboelectric nanogenerator**

**Hak-Jong Choi**, Korea University, South Korea

12:45  
14:15

**LUNCH**

## SESSION 7 - NEW PROCESSES

14:15 **INVITED: Roll-to-roll pilot line for large-scale manufacturing of microfluidic devices**

**Dieter Nees**, Joanneum Research, Austria

14:45 **New materials and methods for nanoimprint patterning of inorganic materials for devices**

**Irene Howell**, University of Massachusetts, USA

15:00 **Dynamic surfaces by controlling its superhydrophobic states**

**Ariadna Fernandez**, ICN2, Spain

15:15 **Fabrication of isolated metal nano pattern using silver ink**

**Jun Taniguchi**, Tokyo University of Science, Japan

15:30 **Soft nanoimprint lithography on 3D printed surfaces**

**Michael Hasliger**, Profactor, Austria

15:45 **INVITED: New NIL processes - an outlook**

**Stephen Y. Chou**, Princeton University, USA

16:20 **Conference Ending**

16:30  
17:00

**BREAK**

17:00 **Tour to the Atlantic Ocean**  
20:00

20:00 **Farewell Dinner**  
23:00