

NNT Conference Program Schedule

Session I: Thermal Nanoimprint (Session Chair: Stephen Chou)

- I.1** (Invited) **Sematech, AMRC and Nano**, Walt Trybula
Sematech, Inc.
- I.2** **Elastic and Plastic Strains in Glassy Phase Nanoimprint**, Barry S. O'Connell, Graham L. W. Cross, Richard M. Langford, and John B. Pethica
SFI Nanoscience Laboratory
- I.3** **Fabrication of Silicon Nanodot Array by Mold-to-Mold Cross Imprinting (MTMCI)**, Sunghoon Kwon, Xiaoming M. Yan, Anthony Contreras, Gabor A. Somorjai, J. Alexander Liddle, Jeffrey Bokor
Lawrence Berkeley Laboratory
- I.4** **Polymer deformation study on thermal nanoimprint lithography**, Yoshihiko Hirai, Satoshi Yoshida, Tomohiro Kanakugi and Takaaki Konishi
Graduate School of Engineering, Osaka
- I.5** **Thin residual layers in nanoimprint lithography by means of partial cavity filling**, Nicolas Bogdanski, Matthias Wissen, Hella-Christin Scheer
University of Wuppertal
- I.6** **Stamp's design effect on 100 nm feature size for 8" NanoImprint Lithography**, S. Landis, C. Gourgon, C. Perret, N. Chaix
CEA-LETI and CNRS-LTM
- I.7** **Nanoimprint of Pyrex Glass with Glassy Carbon Mold prepared by Focused-Ion-Beam Etching**, Masaharu Takahashi, Kohichi Sugimoto, Ryutaro Maeda
Adv. Manufacturing Research Inst., Dept. Of Mechanical Systems Eng., University of Shinshu

Session II: UV-NIL (Session Chair: Christie Marrian)

- II.1** (Invited) **Triple step alignment procedure for UV-based nanoimprint**, A. Fuchs, M. Bender, U. Plachetka, T. Wahlbrink, Y. Georgiev, C. Moormann, H. Kurz
AMICA/AMO GmbH
- II.2** **Advances in Electrostatic Force-Assisted Nanoimprint Lithography (EFAN)**, Xiaogan Liang, Wei Zhang, Mingtao Li, Qiangfei Xia, Haixiong Ge, Xinyu Huang, Stephen Y. Chou
Princeton University
- II.3** **Adhesion studies in step and repeat UV- nanoimprint lithography**, M. Otto, F. Richter, B. Hadam, B. Spangenberg, H. Kurz
Aachen University
- II.4** **A New UV Nanoimprint Lithography (UV-NIL) using an Elementwise Patterned Stamp and Additional Application of Air Pressure**, Hyonkee Sohn, Jun-ho Jeong, Young-suk. Sim, and Eung-suk Lee
Korea Inst. of Machinery and Materials
- II.5** **Multi-Drop Filling in Step-and-Flash Imprint Lithography**, Shravanthi Reddy, Roger T. Bonnecaze
The University of Texas at Austin
- II.6** **UV imprint lithography for uniform and minimum residual layer**, Heon Lee, Sunghoon Hong, Sinung Kwak, Joongsoo Kim
Korea University and NND Company
- II.7** **Sub-50 nm Automated Field-to-Field Alignment in Step and Flash Imprint Lithography**, Philip Schumaker, Jin Choi, Pawan Nimmakayala, Tom Rafferty, Anshuman Cherala, Ali Aghili, and S.V. Sreenivasan
Molecular Imprints Inc.

Session III: Stamps and Templates (Session Chair: Clivia Sotomayor)

- III.1** (Invited) **Nanoimprint Template Development & Commercialization**, Franklin Kalk
DuPont Photomasks, Inc.
- III.2** **6 nm Half-Pitch Lines and 0.04 μm^2 SRAM Cells by Nanoimprint Lithography**, Michael D. Austin, Wei Zhang, Stephen Y. Chou
Princeton University
- III.3** **Proton Beam Writing: A new tool for high aspect ratio Ni stamp fabrication for nano-imprinting**, J.A. van Kan, K. Ansari, P. Shao, A.A. Bettiol and F. Watt
Physics Department NUS
- III.4** **Three dimensional imprinting template produced using evaporated e-beam resist and reactive ion etching**, Lau Kien Mun, D. Drouin, J. Beauvai, E. Lavallée, T. Veres, B. Cui
Quantiscript Inc. and Canada National Research Council
- III.5** **Writing Nano-Imprint Templates by Shaped E-beam Lithography**, Dirk Beyer, Peter Hudek, Olaf Fontagne, Timothy Groves, Jürgen Gramss
Leica Microsystems

Session IV: Application I (Bio) (Session Chair: Helmut Schiff)

- IV.1** (Invited) **High aspect ratio nano-pillar structures and their applications**, Akihiro Miyauchi
Hitachi, Ltd.
- IV.2** **Nanoimprint lithography and SOME applications In Life Sciences**, L. Montelius, P. Carlberg, F. Johansson, T. Mårtensson, R. Bunk, M. Beck, F. Persson, M. Borgström, S.G. Nilsson, B. Heidari, M. Grazczyk, I. Maximov, E.-L. Sarwe, T.G.I. Ling, A. Månsson, M.
Lund University and University of Kalmar
- IV.3** **Quantitative Protein/DNA Analysis in Nanoimprinted Channels**, K. Morton, Y.M. Wang, W. Reisner, Z. Yu, R.H. Austin and S. Y. Chou
Princeton University
- IV.4** **Chemical Patterning of Sub 50 nm Half Pitches via Nanoimprint Lithography and its Application to Protein Patterning**, Sunggook Park, Celestino Padest, Harun H. Solak, Jens Gobrecht, Didier Falconnet, Daniela Pasqui, Marcus Textor, Helmut Schiff
PSI and Swiss Federal Institute of Technology, Zürich and University of Siena
- IV.5** **Fabrication of multi-layered 3D micro fluid channels by reversal imprint lithography**, Takashi Yoshikawa, Hideaki Ooe, Hiroaki Kawata and Yoshihiko Hirai
Osaka Prefecture University

Session V: New Developments (Session Chair: Shinji Matsui)

- V.1** (Invited) **The commercialization / market potential of nanotechnology from an investor's point of view**, Marco Beckmann
Nanostart AG
- V.2** **Flexible Stamp for homogeneous large area Thermal NIL**, T. Nielsen, R.H. Pedersen, O. Hansen, T. Haatainen, A. Tolkki, J. Ahopelto, A. Kristensen
Technical University of Denmark and VTT
- V.3** **Laser Assisted Direct Imprint of SiGe and SiC**, Qiangfei Xia, Hang Zheng, Chris Keimel, Zhaoning Yu and Stephen Y. Chou
Princeton University and University of California at Berkeley
- V.4** **Nano Casting Lithography**, Takashi Yoshikawa, Masatoshi Morimatsu, Masaki Nakajima, Hiroaki Kawata and Yoshihiko Hirai
Osaka Prefecture University
- V.5** **PS-PDMS Block Copolymer for Nanoimprint Lithography**, Philip Choi, Peng-Fei Fu, and L. Jay Guo
University of Michigan, Ann Arbor and Dow Corning Corporation, Midland
- V.6** **Forming Large-Area Low-Cost Dissolvable Polymer Masks for High Resolution Printing and Imprinting**, Charles D. Schaper
Stanford University
- V.7** **Enhancement of the nanostencil method and its applications**, Lianne M. Doeswijk, Marc A.F. van den Boogaart, Daniel Grogg, Juergen Brugger
Microsystems Laboratory and Swiss Federal Institute of Technology Lausanne

Session VI: Metrology (Session Chair: Jouni Ahopelto)

- VI.1** (Invited) **New Developments in Real-time Imprint Monitoring by Scattering-of-light (RIMS)**, Zhaoning Yu, He Gao, and Stephen Y. Chou
Princeton University
- VI.2** **Nano-Imprint Lithography Defect Study**, Lei Chen, Xuegong Deng, Jian (Jim) Wang, Ken Takahashi and Feng Liu
NanoOpto Corporation
- VI.3** **Measurement of residual thickness in nano-imprint lithography using scatterometry**, Patrick Schiavone, Cécile Gourgon, Vincent Farys, Nicolas Chaix, David Fuard
CNRS/CEA
- VI.4** **Displacement Sensing for Overlay Alignment for Nanoimprint Lithography**, Jun Gao, Eric Hoarau, Warren Jackson, Carl Picciotto, Wei Wu
Hewlett Packard
- VI.5** **Nondestructive Metrology of Nanoimprinted Gratings**, Xuegong Deng, Lei Chen, Paul F. Sciortino, and Jian (Jim) Wang
NanoOpto Corporation

Session VII: Resist (Session Chair: Yoshihiko Hirai)

- VII.1** (Invited) **A nanoimprinted polymer microfluidic dye laser**, Daniel Nilsson, Søren Balslev, and Anders Kristensen
MIC, Department of Micro and Nanotechnology
- VII.2** **Use of shear rate effects in nanoimprint lithography**, H.-C. Scheer, N. Bogdanski, M. Wissen, H. Schulz
University of Wuppertal
- VII.3** **Customized Thermosets for Thermal Nanoimprint Lithography with Short Cycle Times**, Freimut Reuther, Mike Kubenz, Christine Schuster, Marion Fink, Marko Vogler, Gabi Gruetzner, Juergen Grimm, Andi Kaepfel
Micro Resist Technology GmbH, Berlin and Westsaechsische Hochschule Zwickau
- VII.4** **Cost Savings using UV-curable sol-gel material and a Micro/Nano-Replication method**, Jörg Kühnholz, Christiane Gimkiewicz
SUSS MicroTec and CSEM
- VII.5** **A simultaneous thermal and UV imprint process circumventing thermal expansion effects**, Erik Theander, Erik Bolmsjö, Marc Beck, Babak Heidari
Obducat AB

Session VIII: Application II (Optics, Electronics & Memory) (Session Chair: Lars Montelius)

- VIII.1** (Invited) **Fabrication of 50 nm half-pitch wire grid polarizer using nanoimprint lithography**, Dr. Ki-Dong Lee
LG Electronics, Inc.
- VIII.2** **Discrete Track Recording (DTR) Media Fabricated Using Nanoimprint Lithography (NIL)**, Paul Dorsey, Andrew Homola, Bruce Harper, Norbert Staud, Shoji Suzuki, Wen Jiang, David Treves, David Wachenschwanz
Komag Inc.
- VIII.3** **Step and Flash Imprint Lithography Dry Etch Development for the Fabrication of Surface Acoustic Wave Devices**, D. J. Resnick, N. V. Le, W. J. Dauksher, K. A. Gehoski and K. J. Nordquist, G.F. Cardinale, J.L. Skinner, A.A. Talin, R.W. Brocato, D.W. Palmer
Motorola Labs and Sandia National Laboratories and Livermore and University of Texas
- VIII.4** **One kilobit Cross-bar Molecular Memory Circuits at 30 nm Half Pitch Fabricated by Nanoimprint Lithography**, Wei Wu, Gun-Young Jung, Deirdre L. Olynick, Zhiyong Li, Joseph Straznicki, Douglas A.A. Ohlberg, Xuema Li, Williams M. Tong, Shih-Yuan Wang, R. Stan
Hewlett-Packard Company and Lawrence Berkeley National Lab
- VIII.5** **Fabrication Process for Polymer Photonic Crystals**, Helmut Schiff, Sunggook Park, Choon-Gi Choi, Chul-Sik Kee, Sang-Pil Han, Keun-Byoung Yoon, Jens Gobrecht
PSI and Electronics and Telecommunications Research Institute and Gwangju Institute of Science and Technology
- VIII.6** **“Reverse” imprinting technique, towards 3D nanofabrication**, Nikolaos Kehagias, M. Zelsmann, K. Pfeiffer, G. Ahrens, G. Gruetzner, C. M. Sotomayor Torres
University College Cork and Micro Resist Technology GmbH

NNT Poster Session

A. Thermal Nanoimprint

- P1.1 **Issues in high aspect ratio pattern fabrication by thermal nanoimprint lithography**, Takaaki Konishi, Tomohiro Kanakugi, Hiroaki Kawata Yoshihiko Hirai
Osaka Prefecture University
- P1.2 **Nanoimprint and Lift-off Process using Poly Vinyl Alcohol**, Ken-ichiro Nakamatsu, Katsuhiko Ton and Shinji Matsui
University of Hyogo, Meisyo Co
- P1.3 **Modular high throughput hot embossing Lithography**, M. Wissen, N. Bogdanski, H.-C. Scheer, T. Glinsner, G. Grützner
University of Wuppertal; EV Group, Microresist Technogy
- P1.4 **Numerical Analysis for Stress and Strain Distributions of Imprint Mold During Nanoimprinting Process**, C. C. Nien, H. Hocheng, K. S. Kao
Nat. Tsing Hua University; CAST/ITRI

B. UV-NIL

- P2.1 **Influence of environmental pressure on pattern quality in UV-based Nanoimprint**, A. Fuchs, M. Bender U. Plachetka, U. Hermanns, H. Kurz
AMICA/AMO GmbH
- P2.2 **Resolution enhancement in nanoimprinting by surface energy engineering**, Gun Young Jung, W. Wu, Z. Li, S. Ganapathiappan, William M. Tong 1,3, S.Y. Wang 1, and R. Stanley Williams
Hewlett-Packard Laboratories

C. New Developments

- P3.1 **Ultrasonics for Nanoimprint Lithography**, Chien-Hung Lin, Rui-Ting Zheng, Rongshun Chen
University of Taiwan, Research Institute
- P3.2 **Deformation of PDMS molds in Soft UV-Nanoimprint Lithography**, Bender, U. Plachetka, J. Ran, A. Fuchs, U. Hermanns, H. Kurz; T. Glinsner, F. Lindner
AMICA/AMO GmbH; EV Group

D. Tools

- P4.1 **NX-3000 Step & Repeat Nanoimprinter**, Hua Tan, Mingtao Li, Lin Hu, Linshu Kong, Colby Steere and Larry Koecher
Nanonex Corporation
- P4.2 **The Great Possibilities of Thermal Nanoimprint on Various Materials by Ni-mold**, Takahisa Kusuura, Akihiko Kanaia, Periyasamy Thilakanb, Hiroshi Gotob, and Ryutaro Maeda
SCIVAX Corporation; Nat. Inst. of Advanced Industrial Science and Technology
- P4.3 **Thermal nanoimprint on 300mm diameter wafer**, Masahiko Ogino, Kosuke Kuwabara, Takashi Ando, Takaaki Ninomiya, Kazo Takahashi and Akihiro Miyauchi
Hitachi Ltd., Ohmika, Hitachi Industries Co. Ltd.,
- P4.4 **A uniform-pressing device for nanoimprint lithography**, Yu-Lun Ho, Jen-Hua Wu, Chuan-Feng Chen, Shou-Ren Chen, and Wei-Han Wang
Industrial Technology Research Institut, Hsinchu
- P4.5 **Passive Compliant Wafer Stage for Single Step Nano Imprint Lithography**, Kee-Bong, Choi, Seung Woo Lee and Jae Jong Lee
Korea Inst. of Machinery and Materials, Daejeon
- P4.6 **The Implementation of the Dual-grating Method for Overlay and Alignment in Nanoimprint Lithography**, Geehong Kim, Jaejong Lee
Korea Inst. of Machinery and Materials, Daejeon

E. Stamps and Templates

- P5.0 **Inspection and Repair Issues for Step and Flash Imprint Lithography Templates**, Kevin. Nordquist, William Dauksher, David Mancini, Douglas Resnick; Harald Hess, Don Pettibone, David Adler, Kirk Bertsche
Motorola Labs, Tempe; KLA-Tencor, San José
- P5.1 **Fabrication strategies for multi-tiered imprint templates**, Gerard M. Schmid, Michael D. Stewart, Ecron Thompson, Stephen C. Johnson, J. Alexander Liddle, and C. Grant Willson
Lawrence Berkeley National Laboratory, Berkeley; Molecular Imprints, Inc., Austin, The University of Texas at Austin
- P5.2 **Cross-linked Polymer Replica of a Nanoimprint Mold**, Wei Wu, Haixing Ge, Zhiyong Li, Gun-Young Jung, Deirdre Olynick, YanfengChen, Shih-Yuan Wang, R. Stanley Williams
Hewlett Packard Laboratories, Palo-Alto; Nanjing University, Nanjing; Lawrence Berkeley National Lab., Berkeley
- P5.3 **Fabrication method of nanoimprinting stamps by photomelting and electroforming**, C.B. Lin, P.Y. Cheng, Hung Yi Lin, Tung Chuan Wu and T.C.Chang
TamKang University, Tamsui, Research Laboratories, Hsinchu, National Chin-Yi Institute of Technology, Taichung
- P5.4 **Nanoimprinting mold fabrication by scanning probe lithography**, Tao Zhu, Gang Luo, Yingying Zhang, Bo Gao, Jin Zhang, Zhongfan Liu
Peking University, Beijing
- P5.5 **Duplication of imprint template using imprint lithography**, Heon Lee, Sung-Hoon Hong; Sinung Kwak, Joongsoo Kim, Jinho Ahn, Subum Shin, Ganghun Moon
Korea University, Seoul; NND Company, Seoul, Hanyang University

F. Application Optics

- P6.1 **Nanoimprinted Polymer Photonic Crystal Slab Waveguide**, Choon-Gi Choi , Chul-Sik Kee, Jin-Tae Kim, Sang-Pil Han, Keun Byoung Yoon, Duck-Sool Kim, Sunggook Park and Helmut Schiff
Basic Res. Lab, Daejeon, Adv. Photonics Res. Inst., Gwangju, Tongmyong University of Information Technology, Busan, Paul Scherrer Inst., Villigen
- P6.2 **Nano-structured plastic solar cell fabricated by direct nanoimprint of semiconducting polymers**, B. Cui, P. Chiu, H. J. Yang, T. Veres, I. Shih, S. Xiao
Canada Nat. Res. Council, Boucherville, McGill University, Montreal, Organic Vision Inc.

G. Application Electronics and Memory

- P7.1 **Fabrication of Submicron Structures in Inherently Conductive Polyaniline by Step & Stamp Imprint Lithography**, Tapio Mäkelä, Tomi Haatainen and Jouni Ahopelto
VTT Information Technology, Espoo
- P7.2 **Transfer Technology of Au Electrode onto Hydrogen Silsequioxane**, K. Nakamatsu, K. Tone, T. Katase, H. Namatsu and S. Matsui
University of Hyogo, Meisyo Co, NTT Basic Research Labs.
- P7.3 **Structuring of organic field-effect-transistors with hot-embossing**, Christian Palfinger, Michael Beutl, Ursula Haas, Barbara Stadlober, Günther Leising
Joanneum Res. Forschungsgesel., Weiz
- P7.4 **Reference pattern fabrication by photo-nanoimprint for CD-AFM**, H. Hiroshima, Y. Kurashima, N. Yamazaki and M. Komuro
MIRAI, Advanced Semiconductor Res. Center (ASRC), Ibaraki
- P7.5 **Embossing – A Novel Technology Revolutionising PCB Production?**, Hannes Voraberger, Sammy Hanna, Arno Klamminger, Erik Moderegger, Michael Beutl, Martin Gaal, Emil List, Günther Leising
AT&S AG, Joanneum Res. Forschungsgesel. mbH, Weiz, Christian Doppler Lab. For Advanced Functional Materials, Graz

H. Application Bio

- P8.1 **Fabrication of microseparation chip using the nanopillar structure formed by nanoimprinting**, Kosuke Kuwabara, Marehito Aoki, Masahiko Ogino, Takashi Ando, Kunihiro Maeda, and Akihiro Miyauchi
Mat. Res. Lab, Hitachi Ltd., Ibaraki University
- P8.2 **Rapid Nanochannel Prototyping using NIL and PDMS**, P. Carlberg, L. Montelius, J. O. Tegenfeldt
University of Lund
- P8.3 **Fully biocompatible nanostructured surfaces allowing functional studies of molecular motors made by NIL**, L. Montelius, R. Bunk, M. Sundberg, J. Rosengren, P. Carlberg, I. Nicholls, S. Tr agerud, P. Omling, A. M ansson
University of Lund; University of Kalmar
- P8.4 **Immobilization of streptavidin on aminoterminated functionalised gold using microcontact printing to obtain biosensors**, A. Errachid, E. Araya, F. Bessueille, C. A. Mills, G. Villanueva, J. Bausells and J. Samitier
Nanobioengineering Lab., Centro Nacional de Microelectronice, Bellaterra
- P8.5 **Nanoimprint Lithography Defined Cantilevers for Integration on CMOS Chips**, P. Carlberg, S. G. Nilsson, L. Montelius
Lund University

I. Metrology

- P9.1 **Pattern Fidelity, Deformation, and Warpage in Nanoimprinted Polymer Nanostructures**, Ronald L. Jones, Christopher L. Soles, Eric K. Lin, Wen-li Wu, Diego M. Casa
NIST Polymers Div., Gaithersburg, Argonne National Lab.

J. Resist

- P10.1 **Fluorinated materials for Nanoimprint Lithography**, Yasuhide Kawaguchi, Takeshi Eriguchi and Akihiko Asakawa
Asahi Glass Co., Ltd. Kanagawa-ken
- P10.2 **NIL on 8" wafers: the impact of the polymer properties**, C. Gourgon, C. Perret, N. Chaix, S. Landis
CNRS, Grenoble, CEA/LETI, Grenoble
- P10.3 **Dissolution Investigations of Topas  for Homogeneous Imprints**, T. Nielsen, M. Vogler, F. Reuther, G. Gruetzner and A. Kristensen
Technical University of Denmark, Mirco Resist Technology GmbH
- P10.4 **A new photo-curable material with high thermal stability for nanoimprint lithography**, N. Sakai, M. Ohtaguchi, T. Hirasawa, T. Miyazawa, T. Hisadzumi and J. Taniguchi
Toyo Gosei Co, Ltd.; Tokyo University of Science