

**Session 1: Monday Oct 22 8:00 AM****CZ SILICON 1**

Time (minutes)	Title	Authors
30	Limitations of the Growth Rate During Pulling of Large Diameter Silicon Crystals by the Czochralski Technique (Invited)	Jochen Friedrich, Thomas Jung, Fraunhofer IISB, Erlangen, Germany; Frank Mosel, Andreas Muehe, PVA Tepla Crystal Growing Systems GmbH, Wettengel, Germany; <u>Jan Seebeck</u> , Fraunhofer IISB, Erlangen, Germany
20	Numerical Analyses and Experimental Validations on Transport and Control of Carbon in Czochralski Silicon Crystal Growth	Hirofumi Harada, Yoshiji Miyamura, Xue-Feng Han, Satoshi Nakano, Shin-ichi Nishizawa, <u>Xin Liu</u> , Kyushu University
20	Effect of numerical parameters on prediction of the melt flow prediction and impurity transport within a simplified and real Cz Si crystal growth process geometry with effect of transverse magnetic fields	<u>Svetlana Demina</u> , Andrey Smirnov, Vladimir Kalaev, STR Group - Soft Impact, Ltd.; Gundars Ratnieks, Lev Kadinski, Siltronic AG
20	New cold crucible for single crystal growth	H. Abouchi, P. Petitpas, C. Garnier, G. Chichignoud, R. Ernst,
20	Effect of Surface Heat Dissipation on Thermocapillary Convection of Moderate Prandtl Number Fluid in a Shallow Annular Pool	<u>Li Zhang</u> , You-Rong Li, Chongqing University
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**Coffee Break: Monday Oct 22 9:50 AM****Session 2: Monday Oct 22 10:10 AM****CZ SILICON 2**

Time (minutes)	Title	Authors
30	Melt Flow Behavior of Industrial Scale Silicon Czochralski Growth with a Transverse Magnetic Field (invited)	<u>Ryusuke Yokoyama</u> , Tsuyoshi Nakamura, Toshiyuki Fujiwara, SUMCO Corporation; Koichi Kakimoto, Kyushu University
20	3D Numerical Studies of Thermal Convection and Impurities Transport in a Czochralski Process for Solar Silicon Growth	Popescu Alexandra, West University of Timisoara; Martin Bellmann, SINTEF Materials and Chemistry; <u>Daniel Vizman</u> , West University of Timisoara
20	Melt flow instability and its effect on the crystal/melt interface in a large size CZ-Si crystal growth	<u>Junling Ding</u> , Xi'an Jiaotong University; Lijun Liu, Zaoyang Li, Yuqing Li,
20	Numerical Modeling of Effect of Thermal Stress and Heavy Doping for Behavior of Intrinsic Point Defects in Large-diameter Si Crystal Growing by Czochralski Method	<u>Y.Mukaiyama</u> , M.Iizuka, STR Japan K.K.; V.M.Mamedov, STR Group - Soft Impact, Ltd.; S.Maeda, GlobalWafers Japan Co.,Ltd.; K.Sueoka, Okayama Prefectural University

20 Physical Model of the Czochralski Crystal Growth in a Horizontal Magnetic Field Josef Pal, HZDR Innovation GmbH, Dresden, Germany; Ilmars Grants, Institute of Physics, University of Latvia, Salaspils, Latvia; Gunter Gerbeth, Helmholtz-Zentrum Dresden-Rossendorf (HZDR), Dresden, Germany

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**Lunch: Monday Oct 22 12:00 PM**

**Session 3: Monday Oct 22 2:00 PM**

**MELT GROWTH**

Time (minutes)	Title	Authors
30	Towards Optimization of Bulk Crystal Growth Recipe by Dynamic Neural Networks (Invited)	<u>N.Dropka</u> , Leibniz Institute for Crystal Growth; M.Holena, Leibniz Institute for Catalysis; S.Ecklebe, Institute of Control Theory; Ch.Frank-Rotsch, Leibniz Institute for Crystal Growth; J.Winkler, Institute of Control Theory
20	Tailoring chemical stress to avoid cracking of scintillator crystals during Bridgman growth	<u>Chang Zhang</u> , University of Minnesota
20	Numerical investigation of the effect of rotation on thermocapillary convection and dopant transport in a liquid bridge	<u>Chengcheng Le</u> , Xi'an Jiaotong University; Lijun Liu, Zaoyang Li,
20	Crucible-free Growth of Mono-si Using Large-area Seeding	<u>Robert Menzel</u> , Hans-Joachim Rost, Frank M. Kießling, Leibniz-Institute for Crystal Growth; Lamine Sylla, SolarWorld Innovations GmbH
20	CZT growth in vertical Bridgman configuration with the rotating baffle	<u>Natasha Dropka</u> , Aleksander G. Ostrogorsky,

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**Coffee Break: Monday Oct 22 3:50 AM**

**Session 4: Monday Oct 22 4:10 PM**

**Memorial for F. Dupret**

TBA

**Session 5: Monday Oct 22 5:00 PM**

**POSTERS**

Title	Authors
Phase-field Modeling of Polyhedral Microstructure Formation	<u>Takuya Uehara</u> , Yamagata University

The Dual Role of the Gold Droplet in Growth of InAs NWs on a (001) InAs Surface	Junghyun Kang, Weizmann Institute of Science; Filip Krizek, Niels Bohr Institute; Magdalena Zaluska-Kotur, Institute of Physics Polish Academy of Science; Peter Krogstrup, Niels Bohr Institute; Perla Kacman, Institute of Physics Polish Academy of Science; Haim Beidenkopf, <u>Hadas Shtrikman</u> , Weizmann Institute of Science
Characteristic of (ZrxHf1-x)N Thin Films Deposited by High Power Impulse Magnetron Sputtering with Different Target Power	Yu-Wei Lin, Hung-Pin Chen, Chao-Te Lee, Wei-Chun Chen, Instrument Technology Research Center, National Applied Research Laboratories
Analysis through simulation of an inverted vertical gradient freeze method for cadmium zinc telluride	John Roerig, University of Minnesota
Effect of Rotation on the Thermal-solutal Capillary-bouyancy Flow During Czochralski Growth of Ge1-XsiX Single Crystal A lumped-parameter model for oxygen transport in Czochralski crystal growth	Ting Shen, Jia-Jia Yu, Li Zhang, <u>You-Rong Li</u> , Chongqing University  <u>Kerry Wang</u> , University of Minnesota; Jochen Friedrich, Thomas Jung, Jan Seebeck, Fraunhofer IISB; Jeffrey J. Derby, University of Minnesota
Characteristic of Crack-free GaN Films Grown on Si(111) Substrate by RF-MOMBE with AlN and AlInN Buffer Layers First Principles and Thermodynamic Studies on Gan MOVPE Processes Understanding the Crystal Growth Mechanism of One Dimensional Rods and Two Dimensional Sheets of ZnO Nanocrystals	<u>Wei-Chun Chen</u> , Chao-Te Lee, Hung-Pin Chen, Yu-Wei Lin, Instrument Technology Research Center, National Applied Research Laboratories, <u>Y.Okawachi</u> , K.Chokawa, M.Araidai, Nagoya University; Y.Kangawa, K.Kakimoto, Kyushu University <u>Sahil Goel</u> , Nidhi Sinha, Binay Kumar, University of Delhi, Delhi-110007, India
Numerical Analysis on 3D Behavior of Floating Zone (FZ) for Silicon Crystal Growth	<u>Xue-Feng Han</u> , Xin Liu, Satoshi Nakano, Hirofumi Harada, Yoshiji Miyamura, Koichi Kakimoto, Kyushu University
Methodology for Multiphysics Flow Simulation in GaN MOVPE Using Thermodynamic Analysis and First Principles Calculations for GaN Deposition Observations of the Point Defect Distributions in Si-CZ Crystals Detached from the Melt During Growth Used the Rapid Cooling and the Slow Cooling Heat Shields	S. Komura, Y. Yoshihiro, Nagoya University; A. Kusaba, Kyushu University; K. Yoshimatsu, N. Okamoto, Nagoya University; Y. Kangawa, K. Kakimoto, Kyushu University; <u>K. Kawakami</u> , Nagoya University <u>Takao Abe</u> , Toru Takahashi, Shin-Etsu Handotai; Koun Shirai, Osaka University
Numerical Analysis of Three-dimensional Marangoni Convection During SiC Crystal Growth by the RF-TSSG Method Two-dimensional Structure Formed by DNA Nanoparticles in a Binary System	<u>Lei WANG</u> , Takashi HORIUCHI, Atsushi SEKIMOTO, Yasunori OKANO, Osaka University; Toru UJIHARA, Nagoya Univeristy; Sadik DOST, University of Victoria Hiroyasu Katsuno, Ritsumeikan University

Step Bunching Induced by Immobile Impurities in a Surface Diffusion Field	Masahide Sato
Influences of Cone-tube Design on AlN PVT Growth Through Global Heat and Mass Transfer modeling and Simulations	G.D. He, Q.K. Wang, J.L. Huang, Y.T. Zhao, Z.H. Wang, <u>L. Wu</u> , Shanghai University
Model-based Control for Bridgman Growth of Scintillator Crystals	<u>Swanand Pawar</u> , University of Minnesota
Numerical study of induction heating in an edge-defined film-fed growth system for beta-Ga <sub>2</sub> O <sub>3</sub> crystal	<u>Zaoyang Li</u> , Manting Su, Chengcheng Le, Ruilin Li, Xi'an Jiaotong University; Wenxiang Mu, Zhitai Jia, Shandong University; Lijun Liu, Xi'an Jiaotong University
Modeling the Optical Floating Zone Crystal Growth System for Materials Discovery	<u>S. Dossa</u> , University of Minnesota; J. Mitchell, Argonne National Laboratory; J. Derby, University of Minnesota

### Session 6: Tuesday Oct 23 8:00 AM

#### SOLUTION GROWTH

Time (minutes)	Title	Authors
30	Crystal Growth from Solution - Prediction of Relative and Absolute Growth Rates (Invited)	M. N. Joswiak, C. J. Tilbury, B. Peters, <u>M. Doherty</u> , University of California Santa Barbara
30	The Challenge of Simulating Mineral Growth from Aqueous Solution (Invited)	Alicia Schuitemaker, Katarzyna Koziara, Curtin University; Marco De La Pierre, Pawsey Supercomputing Centre; Raffaella Demichelis, Paolo Raiteri, Curtin University; Andrew G. Stack, Oak Ridge National Laboratory; Julian D. Gale, Curtin University
20	The structural pathway to the crystallisation of para amino benzoic acid: from solvated molecule through solute clustering and nucleation to the growth of faceted crystals	<u>Kevin Roberts</u> , University of Leeds; Robert Hammond, Xiaojun Lai, Caiyun Ma, Ian Rosbottom, Tom Turner,
20	Numerical Investigation of Optimal Crystal Growth Furnace Design in the RF-heating TSSG Process	<u>Takashi horiuchi</u> , Lei Wang, Osaka University; Takuya Yamamoto, Tohoku University; Atsushi Sekimoto, Yasunori Okano, Osaka University; Toru Ujihara, Nagoya University; Sadik Dost, University of Victoria
20	Prediction System of CFD Simulation in Solution Growth Constructed by Machine Learning-application for Sic Top-seeded Solution Growth-	Toru Ujihara, Yosuke Tsunooka, Tomoki Endo, Can Zhu, Shunta Harada, Nagoya University
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### Coffee Break: Monday Oct 22 10:00 AM

### Session 7: Tuesday Oct 23 10:20 AM

#### NOVEL TOPICS

Time	Title	Authors
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(minutes)

- 30 Displacive Transformations in Floppy Colloidal Crystallites: Unearthing the Role of Hydrodynamic Interactions (Invited) Young Ki Lee, Yifan Wang, John C. Crocker, Talid Sinno, University of Pennsylvania
- 20 Modelling of Nucleation and Crystallization in Simple Metals Via Non-equilibrium Molecular Dynamics Simulations L. A. Zepeda-Ruiz, Lawrence Livermore National Laboratory
- 20 Carbon in Liquid Silicon: Diffusion, Solubility, and Nucleation of Silicon-carbide Particles Abdullah Alateeqi, University of Pennsylvania; Jinping Luo, Lijun Liu, Xi'an Jiaotong University; Talid Sinno, University of Pennsylvania
- 20 Analysis of scintillator crystal growth via neutron imaging and computational modeling J. Derby, C. Zhang, J. Seebeck, University of Minnesota; A. Tremsin, University of California at Berkeley; D. Perrodin, G. Bizarri, E. Bourett, Lawrence Berkeley National Laboratory; S. Vogel, Los Alamos National Laboratory

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**Lunch: Tuesday Oct 23 12:00 PM**

**Session 8: Tuesday Oct 23 02:00 PM**

**EPITAXIAL GROWTH**

- | Time (minutes) | Title  | Authors  |
|----------------|--|--|
| 30             | Modeling of Bowing, Stress and Threading Dislocation Density Evolution in III-nitride Heterostructures Grown on Si Substrate (Invited) | Yuji Mukaiyama, STR Japan KK; Mikhail Rudinsky, <u>Roman Talalaev</u> , STR Group - SoftImpact Ltd.; Momoko Deura, Takuya Nakahara, Takeshi Momose, Yoshiaki Nakano, School of Engineering, the University of Tokyo; Masakazu Sugiyama, Research Center for Advanced Science and Technology, the University of Tokyo; Yukihiro Shimogaki, School of Engineering, the University of Tokyo |
| 20             | Flow Influence on Gan MOVPE Growth-orientation   | <u>Komura Subaru</u> , Kento Kawakami, Yoshihiro Yamamoto, Nagoya University; Akira Kusaba, Kyushu University; Katsunori Yoshimatsu, Naoya Okamoto, Nagoya University; Yoshihiro Kangawa, Koichi Kakimoto, Kyushu University; Kenji Shiraishi, Nagoya University   |
| 20             | Numerical Modelling for Epitaxy of Wide Bandgap Semiconductors   | <u>J. Seebeck</u> , B. Kallinger, E. Meissner, C. Schröter, J. Friedrich, Fraunhofer IISB  |
| 20             | Formation of a Comb-like Step Pattern with Finger-like Protrusions Induced by a Moving Linear Adatom Source                            | Hitoshi Miura, Nagoya City University; Makio Uwaha, Aichi Institute of technology  |
| 20             | Aomistic Simulations of the Edge Dislocation Mobility in Wurtzite AlN by Molecular Dynamics Method                                     | Y.T. Zhao, R.G. Yu, X.Y. Wang, Z.H. Wang, Q.K. Wang, <u>L. Wu</u> , Shanghai University  |

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**Coffee Break: Tuesday Oct 23 1:50 PM**

**Session 9: Tuesday Oct 23 02:10 PM**

**VAPOR-PHASE GROWTH**

Time (minutes)	Title	Authors
30	Optimization of Total Resolved Shear Stress in AlN Single Crystals Homoepitaxially Grown by Physical Vapor Transport Process (Invited)	Q.K. Wang, J.L. Huang, Z.H. Wang, G.D. He, D. Lei, <u>L. Wu</u> , Shanghai University
20	Effect of Nitrogen / Aluminum on Silicon Carbide Poly-type Stability	Shin-ichi Nishizawa, Frederic Mercier,
20	Influence of Crucible Shape on AlN Crystal Growth Uniformity by Physical Vapor Transport Process	Q.K. Wang, G.D. He, Z.H. Wang, J.L. Huang, D. Lei, <u>L. Wu</u> , Shanghai University
20	Modeling the Effect of TaC-coated Crucible on PVT SiC Single Crystal Growth	<u>Alex Galyukov</u> , STR US, Inc.; Wei Fan, Hao Qu, Momentive Performance Materials Inc.; Won-Jae Lee, Dong-Eui University
20	Modeling the Composition of Ternary Vapor-liquid-solid Grown III-V Nanowires	<u>Jonas Johansson</u> , Lund University
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**Session 10: Wednesday Oct 24 8:00 AM**

**PHOTOVOLTAICS**

Time (minutes)	Title	Authors
30	Phase Field Modeling of Grain Boundary Interaction and Evolution During Directional Solidification of Multi-crystalline Silicon	T. Jain, H.K. Lin, J.W. Jhang, <u>C.W. Lan</u> , National Taiwan University
20	Modeling and simulation of silicon melt flow under the influence of heater-generating magnetic field during directional solidification process	<u>Zaoyang Li</u> , Xi'an Jiaotong University; Yue Shao, Lijun Liu,
20	Effect of Oxygen on Dislocation Generation in Si Single Crystal	T. Ide, Kyushu University; <u>S. Nakano</u> , H. Harada, Y. Miyamura, RIAM, Kyushu University; M. Imai, University of Miyazaki; K. Kakimoto, RIAM, Kyushu University
20	Using of Computer Modeling to Increase Pulling Rate and Productivity in Cz Si Crystal Growth for Solar Applications	<u>Zhixin Li</u> , Dalian Linton NC Machine Co., Ltd; Andrey Smirnov, STR Group - Soft Impact, Ltd.; Zhanwen Lu, Yue Zhang, Dalian Linton NC Machine Co., Ltd; Vladimir Kalaev, STR Group - Soft Impact, Ltd.; Hao Fu, Lili Zhao, Harbin Institute of Technology

20 Effect of Schimdt Number ON MC-SILICON RAMASAMY PERUMAL, SSNCE  
GROWTH PROCESS FOR PV APPLICATIONS:  
NUMERICAL MODELLING

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**Coffee Break: Wednesday Oct 24 9:50 AM**

**Session 11: Wednesday Oct 24 10:10 AM  
MELT GROWTH OF OXIDES**

Time (minutes)	Title	Authors
30	Three Dimensional Modeling of Thermal Stress in Semi-transparent Oxide Crystals Grown by Czochralski and EFG Methods	<u>T.Duffar</u> , Universite Grenoble INP; C.Stelian, CNRS
20	Effect of Crucible Geomrtry on Heat Transport and Interface Shape During Growth of Sesquioxide Crystals by HEM Technique	<u>Kaiwei Hu</u> , Lili Zheng, Tsinghua University
20	Numerical Modeling of $\beta$ -Ga <sub>2</sub> O <sub>3</sub> Crystal Growth by Czochralski Method to Investigate the Spiral Formation of Crystal	<u>Masaya Iizuka</u> , Yuji Mukaiyama, STR Japan K.K. /Japan; Vladimir Artemyev, Andrey Smirnov, Vladimir Kalaev, STR Group - Soft Impact /Russia
20	Tuning the Sapphire EFG Process to the Growth of Al <sub>2</sub> O <sub>3</sub> /Yag/ZrO <sub>2</sub> :Y Eutectic	<u>T.Duffar</u> , Universite Grenoble - Alpes INP; L.Carroz, Paris Institute of Nanosciences
20	Numerical Simulation of the Flow, Thermal, and Solute Distributions in Large Size Sapphire Crystals During the Czochralski Growth	Tran Phu Nguyen, <u>Jyh-Chen Chen</u> , National Central University
20	Numerical study on the effect of temperature oscillations on the crystallization front shape during Czochralski growth of gadolinium gallium garnet crystal	Reza Faiez, Laser and Optics Research School