



PROGRAM BOOK

5th European Conference on Crystal Growth

9-11 September 2015

Area della Ricerca CNR, Bologna, Italy

PROGRAM



TUESDAY 8 September 2015		
17:00	Registration Open	
18:30	Welcome Cocktail at the <i>Auditorium Enzo Biagi – Sala Borsa</i>	
WEDNESDAY 9 September 2015		
09:00-09:15	Opening Giuseppe Falini, Department of Chemistry «Giacomo Ciamician», University of Bologna Andrea Zappettini, Institute of Materials for Electronics and Magnetism, CNR, Parma	
09:15-10:00	Plenary lecture I <i>Chair:</i> Simona Fermani "The Joys and Challenges of Macromolecular Crystallization" Naomi Chayen , Faculty of Medicine, Department of Surgery & Cancer, Imperial College, London	
10:00-11:05	SESSION 1a: Fundamentals of Nucleation and Growth Kinetics <i>Chair:</i> Hans Erik Lundager Madsen	SESSION 9a: Fundamentals - Structural Defects and their characterization in Crystalline Materials <i>Chairs:</i> Thierry Duffar & Bogdan Ranguelov
10:00-10:20	"Numerical Modelling of Liquid Phase Diffusion growth of SiGe with uniform compositions" KEYNOTE: Dost Sadik , M. Sakhon, N. Armour	"Interplay mechanism of secondary phase particles and the extended dislocations in CdZnTe crystals" KEYNOTE: Xu Yadong , Yihui He, Ningbo Jia, Rongrong Guo, Yaxu Gu, Yuecun Wang, Wanqi Jie
10:20-10:35	"An in situ view of nucleation" De Yoreo, James J. , Ma, Xiang, Nielsen, Michael H., Chen, Chun-Long	"Nonstoichiometry problems of A ^{II} B ^{VI} vapor grown crystals" Avetissov Igor , Andrew Khomyakov, Albert Davydov, Elena Mozhevitina, Vladimir Chegnov, Nikolai Zhavoronkov
10:35-10:50	"Homogeneous nucleation in small droplets near critical supercooling" Zdeněk Kožíšek , Pavel Demo	"Influence of growth conditions on the optical, mechanical and electrophysical properties the lanthanum-gallium silicate group crystals" Buzanov Oleg, Kozlova Nina, Kozlova Anna , Zabelina Evgeniya, Siminel Nikita, Spassky Dmitriy
10:50-11:05	"Separation of nucleation and growth stages - a way for studying crystal nucleation kinetics and to rule a crystallization process designed to reduce crystal polydispersity" Nanev Christo Nanev , Tonchev Vesselin D.	"Micro-structural characterization of directionally solidified eutectic oxides" Cherif Maya , Gourav Sen, Vicky Vikram Das, Laurent Carroz, Omar Benamara, Michel Parlier, Thierry Duffar

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11:05-11:25	<i>Coffee break</i>	
11:25-12:45	<p>SESSION 1b: Fundamentals of Nucleation and Growth Kinetics <i>Chair:</i> Hans Erik Lundager Madsen</p>	<p>SESSION 9b: Fundamentals - Structural Defects and their characterization in Crystalline Materials <i>Chairs:</i> Thierry Duffar & Bogdan Rangelov</p>
11:25-11:45	<p>"Beams and Blocky Crystals: Another Challenge from the Naica Giant Crystals" KEYNOTE: Otálora Fermin, Joaquín Criado, Juan-Manuel Garcia-Ruiz</p>	<p>"Towards bulk cubic silicon carbide: Growth mechanisms and related defects" KEYNOTE: Yakimova Rositsa</p>
11:45-12:00	<p>"Origin of energy efficiency of axial vibration control technique in melt growth process" Zharikov Evgeny, Andrey Sadovskiy, Ekaterina Sukhanova, Vladimir Kostikov, Igor Avetissov</p>	<p>"Second-phase particle migration via Temperature Gradient Zone Melting" Kerry Wang, Andrew Yeckel, Jeffrey J. Derby</p>
12:00-12:15	<p>"Growth of branched rutile-type TiO₂ via self-assembly and crystal twinning" Jordan Vanja, Rečnik Aleksander</p>	<p>"Effects of Annealing Treatments on Microstructures of Aluminum Nitride Buffer Layer Grown by MOVPE" Kuwano Noriyuki, Kaur Jesbains, Fukuda Junya, Soejima Yohei, Mitsuhara Masatoshi, Suzuki Shuhei, Miyake Hideto, Hiramatsu Kazumasa, Fukuyama Hiroyuki</p>
12:15-12:30	<p>"Selective crystallisation of the more stable β polymorph of L-glutamic acid in an acoustic levitator" Rusin Michal, Ristic Radoljub Ivan, Gnutzmann Tanja, Emmerling Franziska</p>	<p>"The role of screw dislocations in habit modification of KDP by impurity" Lai Xiaojun, Kevin Roberts, Helmut Klapper</p>
12:30-12:45	<p>"Enhanced Crystallization Efficiency of an Active Pharmaceutical Ingredient through the Formation of Micron-Sized Crystals in the Undersaturated State" Rimez Bart, Edith Norrant, Benoît Haut, Benoit Scheid</p>	<p>"The role of twin boundaries in growth of natural and Fe-doped SnO₂ crystals" Tominc Sara, Nina Daneu, Aleksander Rečnik</p>
12:45-13:45	<i>Lunch</i>	
13:45-15:45	First Poster: from Session 1 to Session 5	
15:45-16:00	<i>Coffee break</i>	
16:00-18:10	<p>SESSION 4a: Bulk Crystal Growth <i>Chairs:</i> Janis Virbulis & Ewa Talik</p>	<p>SESSION 10: Nanostructures & Nanoporous Crystals <i>Chair:</i> Florinda Costa</p>
16:00-16:20	<p>"A new large-lattice-constant perovskite substrate crystal" KEYNOTE: Uecker, Reinhard, Klimm, Detlef, Bertram,</p>	<p>"Nucleation approach to polytypism in III-V nanowires" KEYNOTE: Jonas Johanson, Zeila Zanolli,</p>

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	<p>Rainer, Gugushev, Christo, Brützam, Mario, Kwasniewski, Albert, Klupsch, Michael, Gesing, Th.M., Schlom, D.G.</p>	<p>Kimberly A. Dick</p>
<p>16:20-16:40</p>	<p>"Floating-zone Growth of Large Single-Crystal of Haldane Chain Compound $\text{SrNi}_2\text{V}_2\text{O}_8$" KEYNOTE: A.T.M. Nazmul Islam, B. Lake, A.K. Bera, B. Klemke, E. Faulhaber, J.M. Law, A. Schneidewind, J.T. Park, E. Wheeler</p>	<p>"InAs/GaAs sharply-defined axial heterostructures in self-assisted nanowires" D. Scarpellini, C. Somaschini, A. Fedorov, Sergio Bietti, C. Frigeri, V. Grillo, L. Esposito, M. Salvalaglio, A. Marzegalli, F. Montalenti, E. Bonera, P. G. Medaglia, S. Sanguinetti</p>
<p>16:40-16:55</p>	<p>"Europium and potassium co-doped strontium metaborate single crystals grown by the Czochralski method" Głowacki Michal, Solarz Piotr, Ryba-Romanowski Witold, Martín Inocencio R., Diduszko Ryszard, Berkowski Marek</p>	<p>"Mass-transport driven growth dynamics of AlGaAs shells deposited by metalorganic vapor phase epitaxy around dense GaAs nanowire ensembles" Ilio Miccoli, Paola Prete, Nico Lovergine</p>
<p>16:55-17:10</p>	<p>"Flux growth and characterization of highly Yb^{3+}-substituted cubic RE_2O_3 (RE=Gd, Y, Lu) laser crystals and of cubic $\text{Lu}_{1.56}\text{Gd}_{0.41}\text{Eu}_{0.03}\text{O}_3$ crystals" Matias Velázquez, Philippe Veber, Gabriel Buşe, Yannick Petit, Philippe Goldner, Olivier Plantevin, Daniel Rytz, Emmanuel Véron, Rekia Belhoucif, Véronique Jubera, Patrick Aschehough, Gérard Aka</p>	<p>"Low Temperature Growth of Porous ZnO Films for Inorganic–Organic Hybrid Solar Cells" Yoshino Kenji, Akiko Mochihara, Himeka Tominaga, Youei Yamaga, Takashi Minemoto, Shigeru Ikeda</p>
<p>17:10-17:25</p>	<p>"On the crystal growth of incongruent borate type crystal $\text{La}_x\text{Gd}_y\text{Sc}_z(\text{BO}_3)_4$ ($x + y + z = 4$) by the Czochralski method" Lucian Gheorghe, Flavius Voicu, Gabriela Salamu, Federico Khaled, Alexandru Achim, Cristina Gheorghe, Pascal Loiseau, Nicolaie Pavel, Gérard Aka</p>	<p>"Growth of ZnO nanostructures through rapid crystallization" Fioravanti Ambra, Bonanno Antonino, Carotta Maria Cristina, Sacerdoti Michele</p>
<p>17:25-17:40</p>	<p>"Improvement of crystal growth of Li_4SiO_4 single crystals for neutron detection and their scintillation and luminescence properties" Jan Pejchal, Vladimir Babin, Alena Beitlerova, Shunsuke Kurosawa, Yuui Yokota, Akira Yoshikawa, Martin Nikl</p>	<p>"Heat of Fusion of Nano Crystals" Clain Alexander E., Novins Caleb A., Amanuel Samuel</p>
<p>17:40-17:55</p>	<p>"Synthesis and characterization of $\text{Ba}_2\text{Cu}_{1-x}\text{Ni}_x\text{Ge}_2\text{O}_7$, $x = 0, 0.1$ single crystals grown by floating zone technique" Fittipaldi Rosalba, Rocco Luisa, Ciomaga Hatnean Monica, Granata Veronica, Lees Martin, Balakrishnan Geetha, Vecchione Antonio</p>	<p>"Filamentary growth of metals" Richter Gunther</p>
<p>17:55-18:10</p>	<p>"Crystallization of Al_2O_3-YAG-ZrO_2 eutectic ceramic plates by the EFG technique"</p>	

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	Laurent Carroz , Maya Cherif, Nicolas Barthaley, José Peirra, Thierry Duffar	
18:10-19:10	Meeting Delegates ENCG	
THURSDAY 10 September 2015		
09:00-09:45	Plenary lecture II <i>Chair:</i> Roberto Fornari "Blue light emitting diodes: when growth and physics go together" Nicolas Grandjean , ICMP, Ecole polytechnique fédérale de Lausanne	
09:45-10:50	SESSION 4b: Bulk Crystal Growth <i>Chairs:</i> Janis Virbulis & Ewa Talik	Appendix to SESSION 10: "Dual-Type Compound Semiconductor Nanowire Arrays" Joona-Pekko Kakko, Farid Bayramov, Bakhlysh Bairamov, Tuomas Haggren, Veer Dhaka, Teppo Huhtio, Antti Peltonen, Hua Jiang, Esko Kauppinen, Harri Lipsanen
09:45-10:05	"New results in adsorption at semiconductor surfaces - consequences to growth and doping of semiconductor from the vapor" KEYNOTE: Krukowski Stanislaw , Pawel Kempisty, Pawel Strak, Maria Ptasinska, Jacek Piechota	SESSION 5a: Advance in Crystal Growth Technology <i>Chairs:</i> Evgeny Zharikov & Christiane Frank-Rotsch "Numerical modeling and experimental validation of electromagnetical stirring in unidirectional solidification of multicrystalline silicon" KEYNOTE: Negrila Radu Andrei, Popescu Alexandra, Vizman Daniel "Crystal Growth of Cd _{1-x} Zn _x Te by the Traveling Heater Method in Microgravity on Board of Foton-M4 Spacecraft" Borisenko Elena B. , N. N. Kolesnikov, A. S. Senchenkov, M. Fiederle "Modified Bridgman technique for growing Sb-based binary compounds" Pillaca Quispe Mirtha , Miller Wolfram, Cocivera Viviane, Maletin Tamara, Gille Peter
10:05-10:20	"Range of the temperature gradients and the growth rate values in the growth of CZT crystals from the melt" Repiso Eva , Corrochano Álvaro, Rubio Sandra, Plaza Jose Luis, Tsybrii Zinoviia, Vuichyk Mykola, Dieguez Ernesto	
10:20-10:35	"Growth and Performance of Large ZnGeP ₂ Single Crystals" Chunhui Yang , Zuotao Lei, Chongqiang Zhu, Liangcheng Song	
10:35-10:50	"Crystal growth, physical properties and applications of mixed and complex halides" Edith Bourret , Zewu Yan, Eric Samulon, Tetiana Shalapska and Didier Perrodin	
10:50-11:10	<i>Coffee break</i>	
11:10-12:30	SESSION 4c: Bulk Crystal Growth <i>Chairs:</i> Janis Virbulis & Ewa Talik	SESSION 5b: Advance in Crystal Growth Technology <i>Chairs:</i> Evgeny Zharikov & Christiane Frank-Rotsch

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11:10-11:30	<p>“Modeling of dopant transport in gas and melt during silicon FZ crystal growth” KEYNOTE: Sabanskis Andrejs, Surovovs Kirils, Virbulis Jānis</p>	<p>“Experimental evidence that a high electric field acts as an efficient external parameter during crystalline growth of bulk oxide” KEYNOTE: Haumont Raphaël, P. Hicher, R. Saint-Martin, X. Mingner, P. Berthet</p>
11:30-11:45	<p>“Impact of growth rate fluctuations on the bulk quality of Czochralski silicon crystals” Gaspar Guilherme, Lanterne Adeline, Jensen Øyvind, Lehmann Toni, Hagen Vegard, Kildemo Morten, Di Sabatino Marisa, Arnberg Lars, Øvrelid Eivind</p>	<p>“High-pressure and ambient gas effect on the optical floating zone crystal growth of novel oxide and intermetallic compounds” Sass Paul, Robert Schöndube</p>
11:45-12:00	<p>“Reduction of carbon contamination during the melting process of Czochralski silicon crystal growth” Xin Liu, Bing Gao, Satoshi Nakano and Koichi Kakimoto</p>	<p>“Growth of Shaped Oxide Eutectics by the EFG Technique” Stryukov Dmitry, Shikunova Irina, Kurlov Vladimir</p>
12:00-12:15	<p>“N-type doping of bulk gallium nitride grown by hydride vapour phase epitaxy” Patrick Hofmann, Frank Habel, Martin Krupinski, Gunnar Leibiger, Franziska Christine Beyer, Stefan Eichler, Thomas Mikolajick</p>	<p>“High-pressure crystallization of organic compounds in a diamond-anvil cell” Andrzejewski Michal, Andrzej Katrusiak</p>
12:15-12:30	<p>“Growth of 5 kg-level LBO for ultrashort and ultrahigh power laser” Zhanggui Hu, Yinchao Yue, Ying Zhao, Heng Tu</p>	<p>“Direct measurement of the crystallization pressure at the pore scale” Desarnaud Julie, Daniel Bonn, Noushine Shahidzadeh</p>
12:30-13:30	<i>Lunch</i>	
13:30-15:30	Second Poster: from Session 6 to Session 11	
15:30-15:50	<i>Coffee break</i>	
15:50-18:00	<p>SESSION 2a: Theory and Modeling <i>Chair: Liliana Braescu</i></p>	<p>SESSION 8a: Epitaxial Growth - Crystal Growth Interfaces <i>Chairs: Josef Novak & Luca Seravalli</i></p>
15:50-16:10	<p>“Collaboration of atomic and macro scale calculations: polytype and defect control of wide bandgap material” KEYNOTE: Koichi Kakimoto, Bing Gao, Shin-ichi Nishizawa, Satoshi Nakano, Yoshihiro Kangawa</p>	<p>“Analysis of critical thickness for generated misfit dislocation in GaInN/GaN superlattice on GaN by in situ X-ray diffraction” KEYNOTE: Ohsumi Junya, Koji Ishihara, Taiji Yamamoto, Motoaki Iwaya, Tetsuya Takeuchi, Satoshi Kamiyama, Isamu Akasaki</p>
16:10-16:30	<p>“Gaining understanding of crystal growth processes via modeling: Pushing the continuum from the top</p>	<p>“In situ observation of low temperature growth of Ge on Si(111) via RHEED”</p>

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<p>16:30-16:45</p> <p>16:45-17:00</p> <p>17:00-17:15</p> <p>17:15-17:30</p> <p>17:30-18:45</p> <p>17:45-18:00</p>	<p>down” KEYNOTE: Yutao Tao, Andrew Yeckel, Jeffrey J. Derby</p> <p>“Study on the usage of a commercial software (Comsol multiphysics®) for dislocation multiplication model” B. Gallien, M. Albaric , J.P. Garandet, Thierry Duffar, K. Kakimoto , M. M’Hamdi</p> <p>“Fundamentals of energy efficiency of Axial Vibration Control technique for the melt crystal growth” Evgeniy Zharikov, Andrey Sadovskiy, Ekaterina Sukhanova, Vladimir Kostikov, Igor Avetissov</p> <p>“Numerical analysis of dislocation density in multicrystalline silicon for solar cells using experimental verification” Satoshi Nakano, Bing Gao, Karolin Jiptner, Hirofumi Harada, Yoshiji Miyamura, Takashi Sekiguchi, Masayuki Fukuzawa, Koichi Kakimoto</p> <p>“Numerical Modeling of Titanium Distribution in Sapphire Crystals Grown by the Kyropoulos Method” Carmen Stelian, Gourav Sen, Nicolas Barthalay, Thierry Duffar</p> <p>“Evolution of grains during solidification of silicon – attempts of numerical simulations for an understanding” Miller Wolfram, Popescu Alexandra</p> <p>“Analytic scaling function for size distributions of 2D surface islands” Vladimir G. Dubrovskii, N. V. Sibirev, Yu. S. Berdnikov</p>	<p>KEYNOTE: Grimm Andreas, Andreas Fissel, Eberhard Bugiel, H. Jörg Osten, Tobias F. Wietler</p> <p>Structural and electrical characteristics of AlGaIn/GaN heterostructures with thin AlN interlayer on sapphire substrate grown by MOCVD” Raju Ramesh, Kandasamy Prabakaran, Ravi Loganathan, Manavaimaran Balaji, Eric Faulques, Alexandre Crisci, Krishnan Baskar</p> <p>“Two-dimensional Si/Si(111)-(7×7) nucleation affected by step permeability and sink to atomic steps” Rogilo Dmitry, Fedina Liudmila, Kosolobov Sergey, Ranguelov Bogdan, Latyshev Alexander</p> <p>“Epitaxial growth of Ge/Si nanostructures on Si surface patterned by ion irradiation” Smagina Zhanna Victorovna, A.V. Zinoviyev, N.P. Stepina, A.F. Zinovieva, S.A. Rudin, P.L. Novikov, V.A. Seleznev, A.V. Dvurechenskii</p> <p>“Self-assembled strained GeSi nanoscale structures grown by MBE on Si(100)” Nikiforov Alexandr, Vyacheslav Timofeev, Artur Tuktamyshev, Michail Esin, Serge Teys, Oleg Pchelyakov</p> <p>“Quantum dot chains in InAs/GaAs multistacked structures grown by MBE: a strain analysis by FEM” Latini Valerio, Placidi Ernesto, Arciprete Fabrizio, Magri Rita, Patella Fulvia</p> <p>“A study of β-Ga₂O₃ hetero-epitaxial layers grown by MOCVD and ALD” F. Boschi, M. Bosi, E. Buffagni, T. Berzina, C. Ferrari, Fornari Roberto</p>
<p>20:00</p>	<p><i>Social Dinner</i></p>	
<p>FRIDAY 11 September 2015</p>		
<p>09:00-11:10</p>	<p>SESSION 3: Product and Process Design of Pharmaceuticals and Fine Chemicals <i>Chair: Kevin Roberts</i></p>	<p>SESSION 11: Novel Materials and Structures <i>Chairs: Peter Gille & Harri Lipsanen</i></p>

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09:00-09:20	<p>“Using crystal growth to generate single chirality from an achiral start” KEYNOTE: Rene Steendam, Jorge Verkade, Tim van Benthem, Hugo Meekes, Willem van Enckevort, Jan Raap, Floris Rutjes, Elias Vlieg</p>	<p>“In-situ observations of the catalytic growth of nanomaterials” KEYNOTE: Hofmann Stephan</p>
09:20-09:35	<p>“Crystallisation Characteristics of an Organic Material in Industrial Mother Liquor with Impurities” KEYNOTE: Khan Shahid, Mahmud Tariq, Roberts Kevin , Zhu Xiaofeng, George Neil, Sillers Pauline</p>	<p>“Crystal engineering of molecular solids: “light“ interactions for interactions with light” Grepioni Fabrizia, Simone d'Agostino, Dario Braga, Barbara Ventura, Mirko Seri</p>
09:35-09:50	<p>“Preferential Orientation of β-phase Triacylglycerol on Graphite Surface” Fumitoshi Kaneko, Shinichi Yoshikawa, Haruyasu Kida, Kiyotaka Sato</p>	<p>“Chemical Vapor Transport towards new geo-inspired selenite-based materials” Colmont Marie, Minfeng Lü, Almaz Aliev, Jacob Olchowka, Marielle Huvé, Olivier Mentré</p>
09:50-10:05	<p>“Crystallization of L-Glutamic acid polymorphs in stirred and stagnant conditions” Tahri Youssa, Gagnière Emilie, Chabanon Elodie , Bounahmidi Tijani, Mangin Denis</p>	<p>“Spectroscopic examinations of $\text{Lu}_3\text{Al}_5\text{O}_{12}:\text{Pr}$ single crystals” Guzik Adam, Talik Ewa, Pajczkowska Anna, Szubka Magdalena, Kusz Joachim, Balin Katarzyna, Urbanowicz Piotr</p>
10:05-10:25	<p>“Design of Optimal Start-up Procedures for MSMPR Crystallizers” Kamaraju Vamsi Krishna, Power Graha, Hou Guangyang, Zhao Yan, Glennon Brian</p>	<p>“Crystal growth from high-pressure melt and Chemical Vapor Transport of (Si,Ge) monpnictides, a new family of 2D-semiconductors” KEYNOTE: Barreteau Céline, Baptiste Michon, Enrico Giannini</p>
10:25-10:40	<p>“A phenytoin polymorph accessible via surface mediation” Daniela Reischl, Christian Röthel, Eva Roblegg, Heike M.A. Ehmman, Oliver Werzer</p>	<p>“Superconductivity in single crystals of alkali metal intercalated iron chalcogenides” A. Krzton-Maziopa, E. Pomjakushina, Conder Kazimierz</p>
10:40-10:55	<p>“Nucleation Kinetics of Co-crystal by Simultaneous Monitoring of Dissolution and Crystallisation using Process Raman Technique: Precipitation of Burkeite” Boyang. Zou, Xiaojun Lai, Dan Xu, Luis Martin de Juan</p>	<p>“Crystal growth of rare earth containing clathrates and mechanism of rare earth incorporation into the clathrate cages” Prokofiev Andrey, Robert Svagera, Monika Waas, Johannes Bernardi, Silke Paschen</p>
10:55-11:10	<p>“An Investigation into parameters affecting crystal purity in a stirred tank and an oscillatory baffled crystallizer” McLachlan Hannah Ruth, Ni. Xiong-Wei</p>	<p>“Flux growth at 1230°C of cubic Tb_2O_3 single crystals and characterization of their optical and magnetic properties” Velázquez Matias, Philippe Veber, Grégory Gadret, Olivier Plantevin, Daniel Rytz, Mark Peltz, Rodolphe Decourt</p>
11:10-11:30	<i>Coffee break</i>	
11:30-13:40	SESSION 6: Mesocrystals and Nonclassical Crystallisation / Growth of Biological Materials and	SESSION 7a: In-situ Monitoring / Control of Crystal Growth Processes / Crystal

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	<p>Biologically-Controlled Growth <i>Chairs:</i> Damir Kralj & Jaime Gómez Morales</p>	<p>morphology <i>Chairs:</i> Alexander van Driessche & Carlos M. Pina</p>
11:30-11:50	<p>"Multiscale Approach of the Bio Crystal Status and Growth in Mollusc Shells" KEYNOTE: Baronnet Alain</p>	<p>"Mechanistic insights into the early stages of crystallization of rare-earth carbonates" KEYNOTE: Rodriguez-Blanco Juan Diego, Dideriksen, Knud, Tobler, Dominique J., Sand, Karina K., Vallina, Beatriz, Benning, Liane G., Stipp, Susan</p>
11:50-12:10	<p>"Bio-inspired Composite Crystals. Incorporation of nanoparticles in calcite and zinc oxide single crystal" KEYNOTE: Kulak Alexander, Pengcheng Yang, Mona Semsarilar, Oscar Cespedes, Yi-Yeoun Kim, Steven P. Armes, Fiona C. Meldrum</p>	<p>"From Amino Acids to Cements: Crystallization Studied by CLASSIC NMR" KEYNOTE: Hughes Colan, Williams, P. Andrew; Keast, Victoria L.; Edwards-Gau, Gregory R.; Charalampopoulos, Vasileios G.; Harris, Kenneth D. M.; Gardner, Laura J.; Walling, Sam A.; Bernal, Susan A.; Provis, John L.</p>
12:10-12:25	<p>"Optimization of Crystallization using Dialysis Combined with Temperature Control" Niels Junius, Esko Oksanen, Maxime Terrien, Christophe Berzin, Jean-Luc Ferrer Budayova - Spano Monika</p>	<p>"An Investigation into the Particle Growth Pathway of Precipitated Fenofibrate" Tierney Teresa, Rasmuson, Åke C., Hudson, Sarah P.</p>
12:25-12:40	<p>"Influence of shear rate and surface area on nucleation kinetics in aqueous solutions of glycine and urea reveals nonclassical nucleation mechanisms" Carol Forsyth, Danielle Trap, Sefcik Jan</p>	<p>"Growth of nanostructured carbon materials by Supersonic Molecular Beams of C60 on Cu studied by Surface Electron Spectroscopies" Aversa Lucrezia, Tatti Roberta, Taioli Simone, Garberoglio Giovanni, Speranza Giorgio, Cavaliere Emanuele, Gavioli Luca, Iannotta Salvatore, Verucchi Roberto</p>
12:40-12:55	<p>"Infrared light-induced protein crystallization" Kowacz Magdalena, Marchel Mateusz, Juknaitė Lina, Esperança José M. S. S., Romão Maria João., Carvalho Ana Luísa., Rebelo Luís Paulo N.*</p>	<p>"Grain growth competition in directionally solidified multi-crystalline silicon studied with in situ X-ray imaging techniques" Mangelinck-Noël Nathalie</p>
12:55-13:10	<p>"Precursor-based bioinspired synthesis of magnetite nanocrystals" Mirabello Giulia, Söğütoğlu Leyla-Can, Lendesz Jos J.M., Sommerdijk Nico A.J.M</p>	<p>"Evaporation Crystallization of Glycine" Puranen Johanna, M. Louhi-Kultanen</p>
13:10-13:25	<p>"Co-processing of Metformin Hydrochloride with Hydroxypropyl Methylcellulose and Sodium Carboxymethylcellulose during Crystallization to Manufacture Extended Release Tablets" Erdemir Lee Deniz, Chang Shih-Ying, Wong Benjamin, Rosenbaum Tamar, Kientzler Donald, Wang Steve, Desai Divyakant, Kiang San</p>	<p>"Polymer versus monomer action on the growth and habit modification of sodium chloride crystals" Townsend Ellie, W.J.P. van Enckevort, J.A.M. Meije, E. Vlieg</p>

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13:25-13:40	"Heterogeneous nucleation and growth of calcium phosphate films on mica sheets by vapour diffusion" Gómez Morales Jaime	"Morphology and growth rates of ice crystals in the presence of AFP-III" Vorontsov Dmitry , Gen Sasaki, Ken Nagashima, Yoshinori Furukawa
13:40-14:30	<i>Lunch</i>	
14:30-16:25	SESSION 2b: Theory and Modeling <i>Chair: Liliana Braescu</i>	SESSION 8b: : Epitaxial Growth - Crystal Growth Interfaces <i>Chairs: Josef Novak & Luca Seravalli</i>
14:30-14:50	"On Modeling Interface Attachment Kinetics in Melt and Solution Growth Systems" KEYNOTE: Oleg Weinstein, Oren Bass, Alexander Virozub, Andrew Yeckel, Wolfram Miller, Jeffrey J. Derby, Simon Brandon	"Step density waves on vicinal crystal surfaces" KEYNOTE: Rangelov Bogdan Stavrev , Stoyan Stoyanov
14:50-15:10	"Tailoring crystal growth more and more quantitatively via multiscale simulations" KEYNOTE. Heike Emmerich	"Structural study of the innovative 3C-SiC/Si/3C SiC/Si heterostructure for electro-mechanical applications" KEYNOTE. Khazaka Rami , J.F. Michaud, P. Venneguès, D. Alquier, M. Portail
15:10-15:25	"Phase field simulations of particle capture during directional solidification of silicon for solar cells" Henning Hörstermann	"Functionalization of SiC Nanowires by Supersonic Molecular Beams for Photodynamic Therapy" Tatti Roberta , Aversa Lucrezia, Verucchi Roberto, Fabbri Filippo, Rossi Francesca, Attolini Giovanni, Bosi Matteo, Salviati Giancarlo, Iannotta Salvatore
15:25-15:40	"Phase-field study of morphological evolution during directional solidification: influence of temperature gradient and convection" Ankit Kumar , Selzer, Michael, Bhattacharya, Avisor, Nestler, Britta	"Characterisation of sub-micrometer yttrium iron garnet LPE films with low ferromagnetic resonance losses" Dubs Carsten , Surzhenko Oleksii, Linke Ralf, Jauß Thomas, Danilewsky Andreas
15:40-15:55	"Phase Field Crystal Modeling of Heterogeneous Nucleation and Heteroepitaxy" László Gránásy , Frigyes Podmaniczky, Gyula I. Tóth, György Tegze, Tamás Pusztai	"Liquid phase epitaxial growth of GdAP and GdLuAP scintillating films for synchrotron imaging" Riva Federica , Douissard Paul-Antoine, Martin Thierry, Zorenko Yuriy, Petrosyan Ashot, Dujardin Christophe
15:55-16:10	"Phase-field Modelling of Spiraling Ternary Eutectic Dendrites" László Rátkai	"Controlling Polymorphism in Organic Thin Films by Light" Pithan Linus , Caterina Cocchi, Christopher Weber, Anton Zykov, Sebastian Bommel, Steven J. Leake, Peter Schäfer, Claudia Draxl, Stefan Kowarik

PROGRAM



16:10-16:25	"Time Evolution of 2D Cellular Automata with "Crystal Growth" Rules" Alexander Kolevski, Hristina Popova, Georgi As. Georgiev, Vesselin Tonchev	"PDIF-CN2 organic thin-film deposited at room temperature by supersonic molecular beam deposition for n-type OTFT" Chiarella Fabio , Barra Mario, Chianese Federico, Toccoli Tullio, Cassinese Antonio
16:25	Final greetings	

S07-P12 - Microfluidics for in situ study of growth of calcium carbonate.

Li, Lei

S07-P13 - In-situ Raman technique applied to monitoring phase transition of linear alkylbenzene sulphonate (LAS).

Zou, Boyang

S07-P14 - Solubility studies of GaN in NH₃/mineralizer-solutions.

Steigerwald, Thomas Gottfried

S07-P15 - Analysis of temperature data obtained by measurements of temperature field at simulated vertical Bridgman crystal growth of PbCl₂.

Kral, Robert

S07-P16 - Controlling Ice Growth using Selective Infrared Radiation.

Guy, Shlomit

S07-P17 - Electron Microscopy Studies of Growth and Structure of MoS₂-based Hydrodesulfurization Catalysts.

Hansen, Lars Pilsgaard

8 - Epitaxial Growth - Crystal Growth Interfaces

S08-P01 - Impact of boron on the step-free area formation during molecular beam epitaxial growth on MESA structures on Si(111)

Roy Chaudhuri, Ayan

S08-P02 - Semipolar AlN and GaN on Si(100): concept, HVPE technology and layer properties.

Konenkova, Elena Vasilievna

S08-P03 - Structure of AlN layer obtained by thermochemical nitriding of (0001) sapphire substrate with terrace-step surface.

Vovk, Olena Olexandrivna

S08-P04 - Growth of α -Cr₂O₃ thin films on α -Al₂O₃ substrate at low temperature by r.f. magnetron sputtering.

Gao, Yin

S08-P05 - n-i-p triple junction obtained by the Atomic Layer Deposition method.

Gieraltowska, Sylwia

S08-P06 - 2D-islands Nucleation on Si(111) at High Temperature During Sublimation and Thermal Etching by O₂.

Sitnikov, Sergey

S08-P07 - β -Ga₂O₃ crystal deposition on sapphire and silicon substrates by chemical assisted vapor transport method.

Pechnikov, Aleksei

S08-P08 - Dependence of the relaxation of elastic stress on the sign of strain in SiGe epitaxial layers.

Novikov, Alexey

S08-P10 - Influence of thermal treatment on the optical and electrical properties of ZnO:B thin films.

Gritsenko, Lesya Vladimirovna

S08-P11 - Preparation and optimization of a molybdenum electrode for CIGS solar cell.

Feng, Jingxue

S08-P12 - Surface induced weak orientational order and role of isotropic nematic-interface fluctuations in the appearance of an induced nematic film.

Pikina, Elena

S08-P13 - Effects of thermal annealing on AlInGaN/AlN/GaN heterostructure grown by MOCVD.

Ravi, Loganathan

S08-P16 - Growth and Optical Investigation on InGaN/GaN Quantum well Structures grown by Metal Organic Chemical Vapour Deposition.

Kandasamy, Prabakaran

S08-P17 - Synthesis and thin films growth of BaBiO₃, Ba_{1-x}K_xBiO₃ and BaBiO_{1-y}F_{2y} compounds by pulsed laser deposition.

Gawryluk, Dariusz Jakub

S08-P18 - Properties of Crystalline Silicon Layers for Photovoltaic Application grown on Glass by Steady-State Solution Growth.

Ehlers, Christian

S08-P19 - CdHgTe deposited on CdZnTe substrates by Closed Space Sublimation technique.

Rubio, Sandra

S08-P22 - Growth and luminescent properties of single crystalline films of Ce³⁺ doped Gd_{1-x}Lu_xAlO₃ and Pr_{1-x}Lu_xAlO₃ perovskites.

Zorenko Yuriy

S08-P25 - Strained Ge layers on virtual Si_(1-x)Ge(x)(001) substrates.

Schmidt, Jan

S08-P26 - Reconstruction phase transition c(4x4) - (1x3) on the (001)InSb surface.

Bakarov, Askhat

9 - Fundamentals - Structural Defects and their characterization in Crystalline Materials

S09-P05 - Interplay mechanism of secondary phase particles and the extended dislocations in CdZnTe crystals.

Xu, Yadong

S09-P06 - Oxygen precipitation behavior in heavily arsenic doped silicon crystals.

Porrini, Maria

S09-P07 - Blocks and Residual Stresses in Shaped Sapphire Single Crystals.

Grigorievich, Nosov Yuri

S09-P08 - Strain Energy Analysis of Screw Dislocations in 4H-SiC by Molecular Dynamics.

Kawamura, Takahiro

S09-P09 - Study of defect formation in KDP crystals under high supersaturation.

Baskakova, Svetlana Sergeevna

S09-P10 - Czochralski growth and characterization of rare earth-doped Gd₃(Al,Ga)₅O₁₂ crystals.

Influence of thermal treatment on the optical and electrical properties of ZnO:B thin films

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Zinc oxide (ZnO) has unique properties, such as wide band gap $\sim 3.37\text{eV}$, a large exciton binding energy ($\sim 60\text{ meV}$), and effective ultraviolet photoluminescence, what makes it attractive for practical applications. Currently ZnO is one of the most actively studied wide-band semiconductor materials. Zinc oxide is promising to create a new generation of bright optoelectronic devices such as light-emitting diodes, based on heterostructures and homostructures, due to a large exciton binding energy.

Today, the zinc oxide is used in the short-wavelength LEDs [1], detectors, piezoelectric devices [2], sensors [3], power electronics, in dye solar cells, and in many other applications. In particular, boron doped ZnO thin films, are used as the transparent and conductive front contact of solar cells.

The temperature of samples increases during the treatment and exploitation. It leads to the changes of ZnO films properties and can adversely affect on the devices performance. Therefore, the study of the electrical and optical properties modification exposed to the heat treatment is an important task for application of thin films in optoelectronics and solar cells.

Experimental results on optical and electrical properties of ZnO:B thin films deposited by MOCVD on the glass substrates are presented in the report. The effect of thermal treatment in air and in vacuum on a change of optical properties (absorption and transmission spectra, Raman scattering, photoluminescence – PL) and electrical properties (concentration and carrier mobility, as well as the resistivity) of ZnO:B samples was studied.

It was found that the optical absorption near band gap increases with increasing annealing temperature of the samples. Excitonic PL band intensity increases under annealing approximately in three times. Annealing of ZnO:B samples at temperatures above 200°C leads to the degradation of electrical properties: carrier concentration as well as mobility decrease, while the resistivity increases. Subsequent annealing of samples in vacuum at $450\text{-}500^\circ\text{C}$ causes significant recovery of electrical parameters.

References:

- [1] Zhong Lin Wang, *Mater Today*, 7 (2004) 26.
- [2] De Sousa V. C., Morelli M. R., Kiminami G. A., Castro M. S., *Journal of materials science: Materials in electronics*, 13 (2002) 319.
- [3] S. K. Gupta, Aditee Joshi and Manmeet Kaur, *J. Chem. Sci.*, 10 (2010) 57.

