



Extended Defects
in Semiconductors
EDS-2012

Sunday 24th June

15.30 Registration

18.30 **T. Moustakas (PL1)**

The role of extended defects in the performance of electronic and optoelectronic devices

19.30 Welcome Reception

Monday 25th June

8.45 Opening

Session 1: Advanced Characterization I

Chairperson: Theodoros Karakostas

9.00 **A. Rosenauer**, K. Müller, T. Mehrrens, M. Schowalter, J. Zweck, R. Fritz, K. Volz **(I1)**
Measurement of Composition and Strain by STEM

9.40 Ph. Saring, M.A. Falkenberg, **M. Seibt** (O1)
TEM analysis of extended defects in multicrystalline silicon using in-situ EBIC/FIB sample preparation

10.00 **T. Walther**, D.J. Norris, Y. Qiu, A. Dobbie (O2)
The Stranski-Krastanow transition in SiGe epitaxy investigated by transmission electron microscopy

10.20 **C. Trager-Cowan**, G. Naresh-Kumar, B. Hourahine, P. R. Edwards, J. Bruckbauer, R. W. Martin, C. Mauder, A. P. Day, G. England, A. Winkelmann, P. J. Parbrook, A. J. Wilkinson (O3)
Applications of electron channelling contrast imaging for characterising nitride semiconductor thin films

10.40 **Coffee Break**

Session 2: Dislocations I

Chairperson: Hartmut Leipner

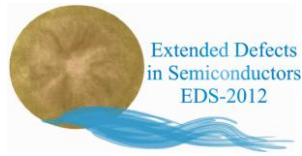
11.10 **A. Romanov**, J.S. Speck **(I2)**
Modeling of misfit and threading dislocations in semiconductor heterostructures

11.50 S. Kraeusel, **B. Hourahine** (O4)
New stable dislocation cores in the III-nitrides

12.10 **M. Reiche**, M. Kittler, M. Krause, H. Übensee (O5)
Electrons on Dislocations

12.30 **M. Albrecht**, T. Markurt, T. Schulz, L. Lymperakis, A. Duff, J. Neugebauer, P. Drechsel, P. Stauss **(I3)**
Dislocation Mechanisms and Strain Relaxation in the Growth of GaN on Silicon Substrates for Solid State Lighting

13.10 **Lunch**



Session 3: Optoelectronic Properties

Chairperson: Horst Strunk

14.30 K. Edagawa (I4)

Photonic Band-Gap and Defect States in a Photonic Amorphous Material

15.00 A. Bondarenko, A.S. Loshachenko, O. Vyvenko, O. Kononchuk (O6)

Impact of Hydrogen on Electrical Levels and Luminescence of Dislocation Network at the Interface of Hydrophilically Bonded Silicon Wafers

15.20 I. Kolevatov M. Trushin, O. Vyvenko (O7)

Energetic spectra of dislocation networks produced by hydrophilic bonding of silicon wafers

15.40 Th. Kehagias, J. Kioseoglou, T. Koukoulou, A.O. Ajagunna, A. Georgakilas, Ph. Komninou (O8)

Crystal and Electronic Properties of Polytypes in InN Nanopillars

16.00 E. Steinman, A. Tereshchenko, O. Kononchuk, V. Vdovin (O9)

Modification of dislocation PL centres due to misfit of bonded Si wafers

16.20 Y. Ohno, Y. Tokumoto, I. Yonenaga, K. Fujii, T. Yao (O10)

Optical properties of prismatic dislocations in ZnO

16.40 Coffee Break

17.00 Poster Session I - Chairperson: Daniela Cavalcoli

Tuesday 26th June

Session 4: Nanostructures

Chairperson: Malcolm Heggie

9.00 B. Doisneau, Y. Kotsar, E. Sarigiannidou, E. Bellet-Amalric, A. Das, E. Monroy (I5)

Strain relaxation in GaN/AlGaIn superlattices grown by PAMBE for intersubband applications

9.40 L. Sahonta, T. Puchler, F. Massabuau, S. Bennett, M. Kappers, R. Oliver, C. Humphreys (O11)

Properties of Trench Defects in $In_{0.2}Ga_{0.8}N$ /GaN Quantum Well Structures

10.00 J. Kioseoglou, E. Kalesaki, I. Belabbas, J. Chen, G. Nouet, Ph. Komninou, Th. Karakostas (O12)

Role of Screw Threading Dislocations as Conductive One-Dimensional Nanostructures in AlN

10.20 G. Tsiakatouras, A. Adikimenakis, K.E. Aretouli, K. Tsagaraki, M. Androulidaki, A. Lotsari, G. Dimitrakopoulos, St. Kennou, A. Georgakilas (O13)

R-plane sapphire nitridation and its effects on the epitaxy of GaN films and nanopillar

10.40 Coffee Break



Session 5: Interfaces and Grain Boundaries

Chairperson: Tadeusz Wosinski

- 11.10 G. Regula** T. Neisius, R. Daineche, S. Juillaguet, B. Pichaud, M. Lancin (I6)
Stacking fault multiplicity in intrinsic and N-doped 4H-SiC
- 11.50 P. Kaeshammer**, T. Sinno (O14)
Molecular dynamics simulation of grain boundary-point defect interactions in crystalline silicon
- 12.10 K. Kutsukake**, K. Inoue, Y. Ohno, Y. Tokumoto, N. Usami, K. Nakajima, I. Yonenaga (O15)
Characterization of $\Sigma 5$ grain boundaries artificially formed in Si crystal by CZ, FZ and Bridgman growth methods
- 12.30 S. Ladas**, M. Botzakaki, A. Kerasidou, N. Z. Vouroutzis, N. Xanthopoulos, L. Sygellou, S. Kennou, V. Ioannou-Sougleridis, Th. Speliotis, S. N. Georga, C. A. Krontiras, **D. Skarlatos** (O16)
Study of the ALD-deposited Al_2O_3 / Germanium interface
- 12.50 Y. Ohno**, Y. Tokumoto, I. Yonenaga, R. Taniguchi, S. R. Nishitani (O17)
Interaction energy of dopant atoms with stacking faults in Si

13.10 **Lunch**

Session 6: Doping- Irradiation- Implantation I

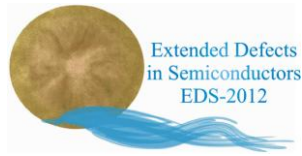
Chairperson: Ichiro Yonenaga

- 14.30 Y. Ohno**, K. Maeda (I7)
Revisiting radiation-enhanced dislocation glide with recent studies on 4H-SiC
- 15.00 J. Boone**, P. Young, G. Sheehan, **M. I. Heggie**, P. Briddon (O18)
Extended defects in radiation damaged graphite
- 15.20 F. Benz**, J. Andrés Guerra T., R. Weingärtner, H.P. Strunk (O19)
How to Describe Concentration Quenching in Rare Earth Doped Semiconductors
- 15.40 N. Sobolev** (O20)
Engineering of Structural Defects and Luminescence Centers in Implanted Silicon Layers
- 16.00 M. Dumont**, **G. Regula**, M-V Coulet, M-F Beaufort, E. Ntsoenzok, B. Pichaud (O21)
Coarsening of nanocavities in He^+ cascade-implanted Si measured by in-situ small angle X-ray scattering
- 16.20 G. Sheehan**, **P. Young**, J. Boone and M. I. Heggie (O22)
Dislocation theory for the mechanics of radiation damage in graphite

16.40 **Coffee Break**

17.00 **Round Table**

"Current needs and perspectives in the research for Extended Defects in Semiconductors"



Wednesday 27th June

Session 7: Devices and Photovoltaics I

Chairperson: Robert Hull

9.00 S. Pantelides (PL2)

Device Degradation – The Defects that Cause the Trouble

10.00 Y. Weng, K. Ohmer, J. R. Köhler, J.H. Werner, H. P. Strunk (O23)

Defects in Laser-doped Silicon Solar Cells

10.20 J. Nikolai, N. Burle, B. Pichaud (O24)

Density, Size and Stoichiometry of Silicon Oxide Precipitates in Thermally Cycled Wafers: Experiments and Modeling

10.40 Coffee Break

Session 8: Devices and Photovoltaics II

Chairperson: Bernard Pichaud

11.10 P. Pirouz (I8)

The Concept of Quasi-Fermi Level and Degradation of SiC Bipolar Devices

11.50 S. Beringov, A. Shkulkov, Yu. Cherpak, M. Vlasiuk, T. Vlasenko, I. Buchovska, V.Kveder, M.Khorosheva, A.Bazhenov (O25)

Multicrystalline Silicon Production for Solar Cells Applications by Continuous Induction Melting in Cold Crucible

12.10 M. Trushin, M. Kittler, W. Seifert, T. Arguirov, A. Klossek, T. Bernhard, W. Gerlach-Blumenthal, A. Hänsel, O. Tober, M. Schwabe(O26)

Study of n-type Cu-In-S Absorber Layer Grown on Cu-tape Substrate (CISCuT)

12.30 I. Bouchama, K. Djessas, A. Bouloufa, J-L. Gauffier (O27)

Characterization of high quality Cu(In,Ga)Se₂ thin films prepared by rf-magnetron sputtering

12.50 Y. Ohno, T. Ohsawa, K. Inoue, K. Kutsukake, Y. Tokumoto, I. Yonenaga, H. Yoshida, S. Takeda, R. Taniguchi, S. R. Nishitani (O28)

Formation of BCC-Cu₃Si in CZ-Si

13.10 Outing

Thursday 28th June

Session 9: Mechanical I

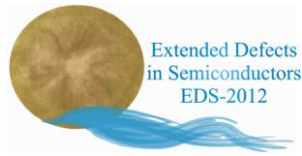
Chairperson: Oleg Vyvenko

9.00 J. Rabier, R. Ghisleni, A. Montagne, J.L. Demenet, J. Michler (I9)

Silicon Nanopillar Deformation: High Stress Plasticity and the Influence of Doping

9.40 J. Guenole, J.Godet, S. Brochard (O29)

First Stages of Plasticity Governed by Amorphous Shell in Silicon Nanopillar: an Atomistic Study



10.00 M. Vallet, J. F. Barbot, M.F. Beaufort, J. Grilhé (O30)
How to modify the orientation of H platelets into semiconductors

10.20 Y. Tokumoto, K. Kutsukake, Y. Ohno, I. Yonenaga (O31)
Propagation Behavior of Nanoindentation-induced Dislocations in AlN Films

10.40 Coffee Break

Session 10: Advanced Characterization II

Chairperson: Michael Seibt

11.10 D. Cavalcoli, A. Minj, A.Cavallini (I10)
Dislocations in III-nitrides investigated by atomic force microscopy

11.50 N. Burle, S. Escoubas, E. Kasper, J. Werner, M. Oehme, K. Lyutovich (O32)
X-Ray Imaging and Diffraction Study of Strain Relaxation of MBE grown SiGe layers on Si

12.10 A. Minj, S. Pandey, Ö. Tuna, D. Cavalcoli, B. Fraboni, A. Cavallini, C. Giesen, M. Heuken (O34)
Defect investigation in In(Ga,Al)N alloys by Scanning Probe Microscopy

12.30 M. Zervos, A.Othonos, D.Tsokkou (O35)
Defect spectroscopy in semiconductor nanowires

12.50 Lunch

Session 11: Dislocations II

Chairperson: Pirouz Pirouz

14.30 R. Hull (I11)
A New Methodology for Mapping Dislocation Generation in Semiconductor Thin Film Growth and Processing: The Materials Cladogram

15.00 T. Geiger, C. Reimann, M. Hollatz, J. Friedrich (O36)
Influencing the as grown dislocation density in directionally solidified multicrystalline Silicon

15.20 M. Naamoun, A.Tallaire, J. Achard, P. Doppelt, A. Gicquel (O37)
Reduction of dislocation densities in single crystal diamond grown by plasma CVD

15.40 A. Lotsari, M. Katsikini, Th. Kehagias, J. Arvanitidis, S. Ves, G. Tsiakatouras, K. Tsagaraki, A. Georgakilas, Ph. Komninou, G. P. Dimitrakopoulos (O38)
Structural Anisotropic Properties of Nonpolar A-plane GaN on R-plane Sapphire

16.00 O. Voß, V.Kveder, W. Schröter, **M. Seibt** (O39)
Interactions of gold and dislocations in silicon

16.20 L. Lymberakis, M. Albrecht, J. Neugebauer (O40)
Excitonic emission from a-type screw dislocations in GaN

16.40 Coffee Break

17.00 Poster Session II - Chairperson: Jean-Luc Demenet



20.30

Conference Banquet

Friday 29th June

Session 12: Mechanical II

Chairperson: Jacques Rabier

9.00 I. Yonenaga (I12)

Defects in SiGe Bulk Alloys

9.40 V. Kisel, S. A. Erofeeva (O41)

Deformation hardening and softening in semiconductors

10.00 H. Leipner, I. Ratschinski, W. Fränzel, J. Haerberle, R. Krause-Rehberg,

G. Leibiger, F. Habel, W. Mook, J. Michler, L. Thilly (O42)

Plastic Deformation and Defect Investigations of GaN Single Crystals

10.20 J.-L. Demenet, C. Tromas, D. Eyidi, M. Amer, J. Rabier (O43)

Dislocations in 4H- and 3C-SiC Single Crystals in the Brittle Regime

10.40

Coffee Break

Session 13: Nanostructures II

Chairperson: Manfred Reiche

**11.10 M. Pervolaraki, Ph. Komninou, J. Kioseoglou, A. Othonos, G.I. Athanasopoulos,
J. Giapintzakis (O44)**

Si and C nanostructures fabricated by picosecond high repetition rate pulsed laser deposition

**11.30 J. Teubert, P. Becker, S. van Heeswijk, F. Furtmayr, J. Arbiol, A. Chernikov,
S. Chatterjee, M. Eickhoff (O45)**

Influence of strain, dislocations and adsorbates on the optical properties of GaN nanowire heterostructures

**11.50 M. Aziz, R.H. Mari, J.F. Felix, M. Henini, R. Pillai, D. Starikov, C. Boney,
A. Bensaoula (O46)**

Deep level transient spectroscopy (DLTS) characterisation of defects in AlGaIn/Si dual-band (UV/IR) detectors grown by MBE

12.10 G. Jurczak, T. D. Young, P. Dłużewski (O47)

Elastic and Electric Field Effects of a Quantum Dot Nucleated on the Edge of a Threading Dislocation

12.30 N. Spyropoulos-Antonakakis, E. Sarantopoulou, Z. Kollia, A. C. Cefalas (O48)

The Role of Extended Defects in Charge Accumulation at the Boundaries of AuN and InN Nanodomains

12.50

Closing Remarks

13.10

Lunch

POSTERS I (MONDAY)

- M.P.1** O. Boyko, Y. Shpotyuk, J. Filipecki
Positron Annihilation Lifetime Study of Extended Defects in Semiconductor Glasses and Polymers
- M.P.2** M. Texier, M. Jublot, B. Pichaud, C. Tromas, J-L Demenet, J. Rabier
Study of low-temperature plastic deformation events in brittle materials using nano-indentation and advanced microscopy techniques
- M.P.3** D. Dompont, I. G. Galben-Sandulache, A. Boulle, D. Chaussende, D. Eyidi, J-L Demenet, M. -F. Beaufort, J. Rabier
Stacking Faults in SiC Single Crystals Undergoing the 3C-6H Polytypic Transition
- M.P.4** A. Mussi, D. Eyidi, A. Shiryaev, J. Rabier
TEM Observations of Dislocations in Plastically Deformed Diamond
- M.P.5** E. Kalesaki, J. Kioseoglou, L. Lymperakis, J. Neugebauer, Th. Karakostas, Ph. Komninou
Semipolar {11-22} AlN surfaces: Morphology and electronic properties
- M.P.6** I. Belabbas, J. Chen, Ph. Komninou, G. Nouet
Dissociation of the 60° basal dislocation in wurtzite GaN
- M.P.7** J. Grym, D. Nohavica, P. Gladkov, E. Hulcius, J. Pangrác, K. Piksová
Epitaxial growth of lattice-mismatched materials on porous buffer layers
- M.P.8** M. Al-Jassim, H. Guthrey, M. Romero, S. Johnston
Defect Behavior in Heavily Contaminated Si Solar Cell Materials
- M.P.9** K. Olender, T. Wosinski, A. Makosa, Z. Tkaczyk, P. Dluzewski, V. Kolkovsky, G. Karczewski
Extended deep-level defects in MBE-grown p-type CdTe layers
- M.P.10** T. Arguirov, O. Vyvenko, M. Oehme, M. Kittler
Dislocation luminescence in highly doped degenerate germanium at room temperature
- M.P.11** V. Kveder, M. Khorosheva, V. Orlov, M. Seibt
Observation of vacancy related defects generated by moving dislocations in Si
- M.P.12** E. Kalesaki, J. Kioseoglou, Ph. Komninou, Th. Karakostas
Electronic properties of polar and semipolar AlN/GaN heterostructures
- M.P.13** J. Kioseoglou, G.P. Dimitrakopoulos, M. Zacharopoulos, Ph. Komninou, Th. Karakostas
Misfit relaxation in non-polar (1100) AlN/GaN interfaces
- M.P.14** X. Kong, S. Albert, A. Bengoechea-Encabo, M. A. Sanchez-Garcia, E. Calleja, A. Trampert
Inversion Domains in Ordered GaN Nanorods Grown by Molecular Beam Epitaxy on Ti Masked Templates
- M.P.15** J. Kioseoglou, T. Koukoulou, Th. Kehagias, F. Furtmayr, M. Eickhoff, H. Kirmse, W. Neumann, Th. Karakostas, Ph. Komninou
Interfacial structure of GaN nanowires on treated Al₂O₃ substrates
- M.P.16** M. Gholami Mayani, S. F. Thomassen, B. O. Fimland, T. W. Reenaas
Large QDs in InAs/GaAs QD bilayers
- M.P.17** Yu Murao, T. Taishi, K. Kutsukake, Y. Tokumoto, Y. Ohno, I. Yonenaga
Impurity-Dependent Dislocation Dynamics in Ge
- M.P.18** P. Kavouras, A. Lotsari, A. Georgakilas, Ph. Komninou, G. P. Dimitrakopoulos



- Influence of Defect Characteristics on the Nanoindentation Response of A-plane GaN thin films*
- M.P.19** Y. Tokumoto, T. Taishi, K. Kutsukake, Y. Ohno, I. Yonenaga
Morphology and Microstructure of GeAs Islands Formed on Ge(111) Surfaces
- M.P.20** Ph. Komninou, P. Gladkov, T. Karakostas, J. Pangrác, E. Hulcius
Structural and photoluminescent properties of low temperature InAs buffer layer grown by MOVPE on GaAs substrates
- M.P.21** G. P. Dimitrakopoulos, A. Lotsari, Th. Kehagias, A. Ajagunna, A. Georgakilas, Ph. Komninou
Defect Structure and Misfit Accommodation in Semipolar S-plane (1-101) InN Grown on R-plane Sapphire
- M.P.22** D.M.Artemiev, I.N.Ivukin, A.E.Romanov, V.E.Bougrov, M.A.Odnoblydov
Mechanical stress control in GaN films on sapphire substrate via patterned porous structure formation

POSTERS II (THURSDAY)

- T.P.1** O. Shpotyuk, R. Golovchak, A. Ingram, V. Boyko, L. Shpotyuk, M. Vakiv
Comparative Study of Extended Free-Volume Defects in As- and Ge-Based Glassy Semiconductors: Theoretical Prediction and Experimental Probing with PAL Technique
- T.P.2** O. Shpotyuk, J. Filipecki, M. Shpotyuk
Destruction-Polymerization Transformations as a Source of Radiation-Induced Extended Defects in Chalcogenide Glassy Semiconductors
- T.P.3** Ch. E. Lekka, P.Patsalas, Ph. Komninou, G.A.Evangelakis
Electronic properties and bonding characteristics of AlN:Ag Thin Film Nanocomposites
- T.P.4** A. Chroneos, L. I. Goulatis, R. W. Grimes, C. Jiang
Defect processes of E-centers in $Si_{1-x}Ge_x$: Density functional theory calculations
- T.P.5** M.A. Gialampouki, Ch.E. Lekka
Structural and Electronic Properties of Metal Oxide Clusters on Single Wall Carbon Nanotubes by Ab-initio calculations
- T.P.6** J. Kioseoglou, V. Pontikis, Ph. Komninou, Th. Karakostas
Diffusion through AlN/GaN interfaces
- T.P.7** M-F Beaufort, A. Declémy, J- F Barbot
Local strain magnification in Helium implanted 4H-SiC
- T.P.8** M. Texier, B. Pichaud, M-F Beaufort, J-F Barbot
Structure of extended defects and induced crystalline disorder in He-implanted silicon carbide
- T.P.9** A.V.Bazhenov, V.S. Kulikauskas, V.A. Steinman, V.V. Privezentsev
ZnO Nanoparticle Formation in Zn^+ Ion Implanted SiO_2/Si Structure
- T.P.10** A. Medvid, R. Rimša, P. Onufrievs, E. Dauksta, G. Mozolevskis, T. Puritis
Mechanisms of p-n junction formation in i-Ge crystal by laser radiation
- T.P.11** E. N. Sgourou, A. Chroneos, C. A. Londos, P. Pochet
Impact of Isovalent Doping and Codoping on Oxygen-Vacancy Complexes in Silicon
- T.P.12** M. Katsikini, F. Pinakidou, E. C. Paloura
N- and Ga-K-edge XAFS study of In implanted GaN: Effect of implantation fluence and annealing temperature
- T.P.13** K. Filintoglou, P. Kavouras, M. Katsikini, J. Arvanitidis, D. Christofilos, S. Ves, E. Wendler, W. Wesch
Effect of In implantation and subsequent annealing on the lattice disorder and nano-mechanical properties of GaN



- T.P.14** **D.Skarlatos**, M.Bersani, M. Barozzi, N.Z.Vouroutzis, V.Ioannou-Sougleridis
Diffusion of implanted Nitrogen in Germanium
- T.P.15** M-M Soumelidou, **J. Kioseoglou**, H. Kirmse, Th. Karakostas, Ph. Komninou
Structure and Electronic Properties of InGaN/GaN Nanowires using EELS
- T.P.16** **M. Botzakaki**, A. Kerasidou, N. Xanthopoulos, D. Skarlatos, S.N. Georga, C.A. Krontiras
I-V Characteristics of ALD - Deposited Al₂O₃ on p-type Germanium Substrates
- T.P.17** A. Siozios, D.C. Koutsogeorgis, E. Lidorikis, G.P. Dimitrakopoulos, Th. Kehagias, H. Zoubos, Ph. Komninou, W.M. Cranton, C. Kosmidis, **P. Patsalas**
The effect of Ag nanoparticle incorporation to the structural changes of laser annealed AlN films
- T.P.18** J. Andrés Guerra T., **F. Benz**, R. Weingärtner, H. P. Strunk
Concentration Quenching of the Luminescence from several Terbium-doped Matrix Materials
- T.P.19** **Miao Yang**, Ye Weng, Horst Strunk
The role of In in the luminescence of Er from Al_xIn_{1-x}N:Er-layers
- T.P.20** H. Kara, K. Şimşek, **N. Kalkan**
Conduction Mechanisms in Sb₂Te₃ Thin Films
- T.P.21** M. Marinova, **A. Mantzari**, A. Andreadou, J. Lorenzzi, G.Ferro, E. Polychroniadis
Influence of Ga Doping on the Micro-Structure of 3C-SiC Layers Grown on α-SiC Substrates by VLS Mechanism
- T.P.22** **M. Wu**, S.C. Erwin, A. Trampert
Determination of clustering in dilute GaN:Gd thin films
- T.P.23** **A. Adikimenakis**, K. E. Aretouli, K. Tsagaraki, M. Kayambaki, A. Georgakilas
Mechanism of Si outdiffusion in plasma assisted molecular beam epitaxy of GaN on Si