

# CONFERENCE PROGRAM

## **Monday June 16<sup>th</sup>**

8:30-8:38

### **WOCSDICE OPENING**

8:38-10:50

### **OPTOELECTRONIC, THz AND LOW BAND GAP-SEMICONDUCTOR DEVICES**

**Chair: D. Pavlidis**

8:38

**III-Nitride based Semiconductor for Optoelectronic Devices From Deep UV(200nm) to THz (300 microns) (invited)**

**Manijeh Razeghi**

9:02

Detection of terahertz radiation by tightly concatenated InGaAs field-effect transistors integrated on a single chip

S.Yu. Shapoval\*

9:14

Graphene THz Circuitry by Nano-Constriction Designs

H. Hartnagel

9:26

Plasmon-assisted hot-phonon effect in GaN 2DEG channel

E. Šermukšnis

9:38

Heterogeneous Integrated HBV-based Frequency Quintupler for 500 GHz

A. Malko

9:50

**Low Power Devices (invited)**

**Debdeep Jena**

10:14

Characterization of InSb-QW structures with Al<sub>0.25</sub>In<sub>0.75</sub>Sb / Al<sub>0.15</sub>In<sub>0.85</sub>Sb buffer layer for strain reduction

S. Fujikawa

10:26

GaAs-based on-chip rectenna device for proximity communication application

F. Mustafa

10:38

Low cost full wafer fabrication of submicron T-shape gates using double angular thin film deposition technique

E.V. Erofeev

10:50-11:10

### **COFFEE BREAK**

11:10-13:10

### **III-N BASED POWER DEVICES**

**Chair: D. Alquier**

11:10

**Advanced GaN Power Devices for Automotive Applications (invited)**

**Tsutomu Uesugi**

11:34

**Challenges for Schottky rectifiers on GaN grown on Silicon (invited)**

**Frederic Cayrel**

11:58

Low-Dislocation Density Bulk GaN Schottky Diodes

D. Pavlidis

12:10

Investigation on GaN-based Schottky diodes under off-state stress

E. Bahat-Treidel

12:22

Vertical Field Effect Transistors with p-GaN Current-Blocking Layer

W. Witte

12:34

Effects of buffer leakage current on breakdown voltage in AlGaIn/GaN HEMTs with a high-k passivation layer

K. Horio

12:46	High polarization high breakdown voltage AlN/GaN-on-Silicon transistors	N. Herbecq
12:58	Different layer designs for normally-off GaN HEMTs with ultrathin AlN barrier, GaN cap and in situ SiN passivation	M. Capriotti

13:10-16:00

### LUNCH & BREAK

16:00-17:36

### SEMICONDUCTOR TRANSPORT AND THERMAL ISSUES IN III-NITRIDES

**Chair: J. Kuzmik**

16:00	<b>Semiconductor Transport Properties and Power Devices Using III-Nitrides (invited)</b>	<b>Enrico Bellotti</b>
16:24	Gate Leakage Current in Nitride-Based HFETs	R.J. Trew
16:36	Impact of buffer layers on thermal properties of AlGaIn/GaN on-SiC high electron mobility transistors (HEMTs)	M. Power
16:48	Examination of thermal effects in GaN-based devices by means of electro-thermal Monte Carlo simulators	S. Pérez
17:00	Temperature extraction in Normally-Off AlGaIn/GaN HEMTs using Transient Interferometric Mapping	C. Fleury
17:12	AlN/GaN HEMTs with thin GaN/AlN buffer layers on sapphire (0001) substrates	Ch. Zervos
17:24	Frequency dispersion of capacitance in III-N heterostructures	J. Oswald*

17:36-18:00

### COFFEE BREAK

18:00-20:12

### OPTOELECTRONIC DEVICES

**Chair : M. Razeghi**

18:00	<b>Polaritonic Devices (invited)</b>	<b>Pavlos Savvidis</b>
18:24	<b>Organic devices: the Organic Light Emitting Transistor (invited)</b>	<b>Michele Muccini</b>
18:48	Thermally-activated degradation of InGaIn-based green lasers: degradation mechanisms and acceleration laws	M. Marioli
19:00	SRH non-radiative recombination in GaIn-based LEDs: a study based on lifetime and DLTS measurements	M. la Grassa
19:12	Characterization of In <sub>x</sub> Ga <sub>1-x</sub> N/GaN MQWs heterostructures for solar cell applications	E. Dogmus
19:24	Impact of contact patterning on light extraction in AlGaIn/InGaIn/GaN light-emitting diodes	I. Khmyrova
19:36	Wide spectrum LEDs with the top periodic metal p-contact of submicron distance	I. Khmyrova
19:48	Determination of surface defect density in CdTe heterostructures using	T. Myers

20:00	photoluminescence intensity measurement Enhanced absorption in as-grown GaAs nanowires on silicon substrates	K. Moratis
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## ***Tuesday June 17<sup>th</sup>***

### **8:18-10:54      VARIOUS COMPOUND SEMICONDUCTOR DEVICES AND DEVICE PROCESSING**

**Chair: F. Calle**

8:18	<b>GaO-based Power Devices (invited)</b>	<b>Masataka Higashiwaki</b>
8:42	<b>Processing Issues for Reliable 4H-SiC MOSFET (invited)</b>	<b>Fabrizio Roccaforte</b>
9:06	Electrical characterization procedure of power transistors: Application in the case of 4H-SiC JFETs	M. Vassakis
9:18	Electrical properties of CeO <sub>2</sub> thin films deposited on AlGaIn/GaN heterostructure	P. Fiorenza
9:30	Thermal Reliability of the Devices Transplanted by Fluidic Self-Assembly Using Molten Ga Bumps	K. Maezawa
9:42	Epitaxial Ga-polarity AlN/GaN (0001) HEMTs on polycrystalline diamond substrates	A. Georgakilas
9:54	Plasma-oxidised metal layers for gate insulation in GaN-based devices	A. Vescan
10:06	Mechanism of Ohmic contact formation in Ti/Al bilayers on AlGaIn/GaN heterostructures with a different crystalline quality	G. Greco
10:18	Effect of SiN Passivation and Chemical Treatments (H <sub>2</sub> SO <sub>4</sub> and H <sub>2</sub> O <sub>2</sub> ) on AlGaIn/GaN HEMT on Silicon Substrates	Z. Zaidi
10:30	Investigation of ZEP 520A behavior in process of submicron GaN HEMTs slanted gate fabrication	E. Bahat-Treidel
10:42	Fabrication and characterization of multi-channel AlGaIn-AlN-GaN HFET	H. Yacoub

10:54-11:18

### **COFFEE BREAK**

### **11:18-13:06      DEVICE MODELING**

**Chair: E. Bellotti**

11:18	<b>FinFETs: compact modeling - low frequency noise (invited)</b>	<b>Charalambos Dimitriadis</b>
11:42	Optimization of junction and junctionless FinFETs	D. Tassis
11:54	A compact model for silicon carbide JFET	M. Bucher
12:06	TCAD simulations of 4H-SiC VJFETs	D. Stefanakis
12:18	Simulation of field-effect transistor behavior in metallic nanowire channel transistors	J.D. Bateman
12:30	Analysis of Various Device Simulators for AlGaIn/GaN HEMTs	S. Rajawat

12:42	A Fully Two-Dimensional Simulator of Quantum Well (QW) III-V FETs: Short Channel and Gate Tunneling Effects	A. Gili
12:54	Custom Hardware Arithmetic via High-Level Synthesis	M. Dossis*

13:18-14:20

### LUNCH

14:20-15:44

### III-Ns DEVICES

**Chair: E. Piner**

14:20	Current instabilities in a GaN Gunn heterostructure	J.Y. Duboz
14:32	Characterization of InAlN/GaN high electron mobility transistors supported by fast 3-D electrothermal device/circuit simulation	M. Molnár
14:44	GaN quantum dots as charge storage elements for memory devices	P. Dimitrakis
14:56	Novel humidity and temperature sensors based on GaN/Si acoustic structures for GHz applications	A. Stefanescu
15:08	Reliability improvement of AlGaIn/GaN HEMTs for space applications	S. Dalcanale
15:20	A study of the fabrication of devices and the characterization of GaN nonowires and the GaN/Si heterojunction	G. Doundoulakis
15:32	Nanopatterning of Si (111) substrates for selective growth of III-nitride nanowires by plasma - assisted molecular beam epitaxy	P. Dimitrakis

16:10-19:30

### EXCURSION TO GALAXIDI

19:45 - 22:30

### DINNER AT ITEA

## Wednesday June 18<sup>th</sup>

14:50-15:00

### EXMATEC OPENING

15:00-17:00

### GRAPHENE AND C-RELATED MATERIAL AND DEVICES

**Chair: M. Suemitsu**

15:00	<b>Graphene Biosensors (invited)</b>	<b>José A. Garrido</b>
15:24	<b>Graphene Electronics (invited)</b>	<b>Omid Habibpour</b>
15:48	High frequency signal detection using ballistic graphene"	G.Deligeorgis
16:00	Processing and characterization of epitaxial graphene field effect transistor with high quality aluminum oxide gate dielectric	K. Vassilevski
16:12	Fabrication of carbon nanotube thin-film transistor integrated circuits on a flexible substrate using transfer technique	T. Mizutani
16:24	Graphene foam for high performance supercapacitors	F. Calle
16:36	TEM study of the AlN grain orientation grown on NCD diamond substrate	F. Lloret
16:48	Synthesis of a hybrid nanocomposite material with enhanced fire retardant and mechanical properties for transport structures	G.Tsiakatouras
17:00	Direct Growth of Graphene on SiO <sub>2</sub> Substrate by Thermal & Laser CVDs	K. Matsumoto
17:12	Synthesis of Ga-based compound materials on graphene on Insulator by electrochemical deposition at room temperature	A.M. Hashim

17:24-17:48

### COFFEE BREAK

17:48-20:00

### III-Ns MATERIAL AND DEVICES

**Chair: K. Maezawa**

17:48	<b>Material aspects in developing normally-off GaN-based transistors (invited)</b>	<b>Jan Kuzmik</b>
18:12	Technology road map for monolithic integration of III-nitrides based active components and sensors with RF-MEMsfor reconfigurable smart microsystems	G. Konstantinidis
18:24	Understanding the role of interfacial layers on the spontaneous growth of GaN nanowires by plasma assisted molecular beam epitaxy	S. Eftychis
18:36	Kinetics of Indium Incorporation in RF-	E. Papadomanolaki

18:48	MBE of InGaN films on GaN(0001) Rapid Thermal Annealing Effects on Polycrystalline InGaN Thin Films Deposited on Fused Silica Substrates	S.A. Kazazis
19:00	In- and N-face polarity InN (0001) heterostructures on Si (111) substrates	A. Adikimenakis
19:12	Importance of substrate temperature in one-step or two-step process of spontaneous GaN nanowire growth by plasma-assisted molecular beam epitaxy	S. Eftychis
19:24	Cathodoluminescence mapping of Al <sub>x</sub> Ga <sub>1-x</sub> N/Al <sub>y</sub> Ga <sub>1-y</sub> N multiple quantum wells for UV-C LEDs and lasers	U. Zeimer
19:36	Effect of AlGa <sub>N</sub> barrier thickness on the cut off frequency of AlGa <sub>N</sub> /Ga <sub>N</sub> High electron mobility transistors	R. Yahyazadeh
19:48	50th Workshop on compound semiconductor materials and devices (WOCSEMMAD 2014): a conference report	D. Pavlidis
20:00-20:10	<b>WOCSDICE closure</b>	

## Thursday June 19<sup>th</sup>

### 8:30-11:00 ADVANCED CHARACTERIZATION TECHNIQUES

Chair: A. Georgakilas

8:30	<b>Advanced of Optical Polarization Spectroscopy Methods (invited)</b>	Norbert Esser
9:00	<b>Monitoring of carrier dynamics in semiconductor heterostructures by nonlinear optical and holographic techniques</b>	Kęstutis Jarašiūnas
9:30	Study of defects in II-VI heterostructures using imaging confocal photoluminescence	Thomas H. Myers
9:42	Residual strain assessment by FTIR: application to AlN/Si and 3C-SiC/Si hetero-epilayers	Y. Cordier
9:54	High pressure Raman study of In <sub>0.37</sub> Ga <sub>0.63</sub> N	J. Arvanitidis
10:06	Nanoscale characterization of interfaces at gate dielectrics on compound semiconductors	P. Fiorenza
10:18	Evaluation of Local SiN <sub>x</sub> /GaN Interface Trap-density fluctuations in AlGaIn/GaN HEMTs by Electroluminescence microscopy	M. Baeumler
10:30	Electrical characteristics of PA-MBE AlN films for MEMS capacitive switches	M. Koutsourelis

10:42-11:00

### COFFEE BREAK

### 11:00-13:00 2D MATERIALS-OXIDES

Chair: Ph. Komninou

11:00	<b>Two dimensional crystals for nanoelectronics (invited)</b>	Athanasios Dimoulas
11:30	<b>Graphene based Electronic &amp; Photonic Devices, Circuits and Systems (invited)</b>	Maki Suemitsu
12:00	Molecular beam epitaxy of MoSe <sub>2</sub> layers on Bi <sub>2</sub> Se <sub>3</sub> and wide band gap AlN(0001) substrates	E.Xenogiannopoulou
12:12	1D and 2D ZnO nanostructures: from materials to devices	D. Alquier
12:24	Towards stable zinc oxide and zinc nitride transparent bipolar devices from a single rf-magnetron sputtering zinc nitride target	G. Konstantinidis
12:36	C-H complex defect and its influence in ZnO single crystal	Y. Zhao

12:48 Highly crystalline molybdenum oxide hole transport and substoichiometric molybdenum oxide hole extraction layers for efficient organic photovoltaics N. Konofaos

13:00-14:00

### LUNCH

14:00-16:02

### STRUCTURAL CHARACTERIZATION AND DEFECTS

**Chair: M. Baeumler**

14:00	<b>Characterization of Dislocations in Semiconductor (invited)</b>	<b>Balaji Raghothamachar</b>
14:30	InGaAs thin films grown on porous GaAs substrates: Microstructure and Strain accommodation	C. Bazioti
14:42	Contacting n-InP with Ni	J.L. Lábár
14:54	A phase shift method for IDB character determination in HRTEM images	T. Koukoura
15:06	Structural properties and strain relaxation of PAMBE-grown InGaN thin layers	G.P. Dimitrakopoulos
15:18	Metallic Vacancies at GaN/AlN heterostructures	J. Kioseoglou
15:30	Effect of crystallography on the extent of deformation in GaN single crystals	G.P. Dimitrakopoulos
15:42	<b>Crystal Defects in Wide Bandgap Semiconductors (invited)</b>	<b>Dimitris Pavlidis</b>

16:15-19:00

### EXCURSION TO KORYKEION OR ARCHEOLOGICAL MUSEUM/SITE

19:30 - 23:00

### DINNER AT LIVADI



## Friday June 20<sup>th</sup>

8:00-10:45

### INTERFACES /DEVICES PROCESS TECHNOLOGIES

**Chair: A. Dimoulas**

8:00	<b>Influence of Interfacial Reactions on the Resistance of Contacts to III-V, III-N and Group IV Semiconductors (invited)</b>	<b>Suzanne Mohney</b>
8:30	Role, formation and process compatibility of heavily doped layers in silicon carbide devices	K. Vassilevski
8:42	Conductivity compensation of the SiC by electrons irradiation with energy 0.9 MeV	A.A.Lebedev
8:54	Mesoscale phase separation and strain relaxation phenomena in high indium content InGaN epilayers grown by molecular beam epitaxy	C. Bazioti
9:06	An analytical - numerical model for the mobility of InGaN/InN/InGaN high electron mobility transistor (DHEMT)	R. Yahyazadeh
9:18	Formation of p-type layer of Mg-implanted GaN by TA/LA annealing	S. Matsumoto
9:30	An analytical-numerical model for the two dimensional quantum well resistivity of AlGaIn/GaN transistors	R. Yahyazadeh
9:42	Lattice tilt in AlN grown on 3C-SiC and Si(111) with an off-cut	Y. Cordier
9:54	Ge-doping of GaN based nanowires and AlN/GaN nanowire heterostructures	J. Schörmann

09:54-10:18

### COFFEE BREAK

10:18-12:36

### NEW MATERIALS-NANOSTRUCTURES

**Chair: Y. Cordier**

10:18	<b>III-Bismides: promising new semiconductors for efficient photonic devices (invited)</b>	<b>Stephen Sweeney</b>
10:48	An importance of silicon nitride interlayer for arrangement and properties of GaN nanowires grown by plasma-assisted MBE on silicon substrates	Z.R. Zytkeiwicz
11:00	Influence of substrate microstructure on self-induced nucleation of GaN nanowires by plasma-assisted MBE observed in-situ by RHEED and quadrupole mass spectrometry	M. Sobanska
11:12	Growth mechanism of catalyst-free GaN	L. Lymparakis

	nanowires: An atomistic view	
11:24	Structural analysis of inclined GaN nanowires grown on r-plane sapphire	G. P. Dimitrakopoulos
11:36	Spontaneous growth of GaN nanowires on bare and AlN treated Si (111)	Ph. Komninou
11:48	Structure of GaAs/AlGaAs core-shell nanowires grown on Si(111)	Th. Kehagias
12:00	InAs <sub>x</sub> P <sub>1-x</sub> Quantum Dot in Single InP Nanowire	Linsheng Liu
12:12	Investigation of (211)B InAs/GaAs quantum dot-based heterostructures by TEM techniques	Th. Kehagias
12:24	Si nanowires (NWs) conversion to SiC NWs	F. Lloret
12:36-12:40	<b>EXMATEC closure</b>	
12:40-13:45	<b>LUNCH</b>	