GaN Marathon

Venezia, Palazzo Cavalli-Franchetti, 20-22 June 2022

GaN marathon 2022

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UNIVERSITÀ DEGLI STUDI DI PADOVA

DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE

Technical program committee

- Matteo Meneghini (Univ. Padova, General Chair),
- Enrico Zanoni (Univ. Padova, Honorary Chair)
- Gaudenzio Meneghesso (Univ. Padova, Director of host institution)
- Frank Altmann (Fraunhofer, IMWS),
- Oliver Ambacher (Fraunhofer, IAF),
- Sylvain Delage (III-V labs),
- Thomas Detzel (Infineon, Austria),
- Juraj Marek (STUBA),
- Farid Medjdoub (IEMN),
- Piotr Perlin (Unipress),
- Ulrich Schwarz (TU Chemnitz),
- Arno Stockman (ONSemiconductor),
- Martin Strassburg (ams OSRAM),
- Andreas Waag (TU Braunschweig),
- William Vandendaele (CEA-LETI),
- Tim Wernicke (TU Berlin),
- Shuzhen You (IMEC)

Local organizing committee

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Monday 20th, June				
8:30 AM	**OPENING**			
9:00 AM	PNL_1	Plenary	Hiroshi Amano	**Nagoya university**, New III-N devices on parade
9:35 AM	PNL_2	Plenary	Debdeep Jena	**Cornell University,** A Whole New World For Gallium Nitride Electronics
10:10 AM	PNL_3	Plenary	Srabanti Chowdhury	**Stanford University**, Unleashing the full potential of GaN with avalanche and integrated thermal management
10:45 AM	**Coffee break**			
OPTICAL DEVICES 1				
11:05 AM	OD_1	Invited	Åsa Haglund	**Chalmers University**, Electrochemical etching – a key enabler for thin-film VCSELs and LEDs?
11:25 AM	OD_2	Invited	Martin Albrecht	**IKZ Berlin**, The role of dislocations in hillock formation in the growth of AlGaN on AlN
11:45 AM	OD_3	Regular	Dominik Meyer	**Aixtron**, Understanding the mechanism of Ga incorporation in InAlN and InGaN grown by MOCVD
12:00 AM	OD_4	Regular	Patrick Loretz	**Evatec AG**, In-situ Si doped GaN sputtered from the liquid phase
12:15 PM	OD_5	Regular	Anna Kafar	**Institute of High Pressure Physics**, Structural and emission improvement of cyan-emitting InGaN quantum wells by introducing large substrate misorientation angle
12:30 PM	OD_6	Regular	Christian Monachon	**Attolight**, Cathodoluminescence spectroscopy applied to nanoscale strain variation measurement
12:45 PM	OD_7	Regular	Carole Pernel	**Leti**, Effect of plasma process on nGaN surface probed with electrochemical short loop
1:00 PM	OD_8	Regular	Alberto Tibaldi	**Politecnico di Torino**, Trap-assisted tunneling in GaN-based LEDs: a nonequilibrium Green's function study
1:15 PM	**Lunch break**			
POWER GaN TECHNOLOGY				
2:30 PM	PGT_1	Invited	Herbert Pairitsch	**Infineon**, Future 'greener' applications enabled by UltimateGaN
2:50 PM	PGT_2	Invited	Michael Heuken	**AIXTRON**, Epitaxial growth of vertical GaN device layer stacks on 200 mm engineered substrates
3:10 PM	PGT_3	Regular	Christian Manz	**Fraunhofer IAF Freiburg**, AlScN high electron mobility transistor structures grown by metal-organic chemical vapor deposition
3:25 PM	PGT_4	Regular	Patrick Dihele	**Fraunhofer Institute for Microstructure of Materials and Systems IMWS**, A new approach for high resolution TEM analysis of electrically active defects in pGaN HEMT devices
3:40 PM	PGT_5	Regular	Kalparupa Mukherjee	**Cambridge GaN Devices**, Characterization of the novel ICeGaN 650V/8.5 A, 200 mΩ power device technology
3:55 PM	PGT_6	Invited	Peter Moens	**ONSemiconductor**, Steep Subthreshold Transistors: A Gem from the AlGaN/GaN Power Device World
4:15 PM	**Coffee break**			
RF TECHNOLOGIES and MODELING				
4:35 PM	RTM_1	Regular	Alexis Papamichail	**Linköping university**, Compositionally graded channel HEMTs for improved linearity in low-noise RF amplifiers
4:50 PM	RTM_2	Invited	Patrick Fay	**Univ. Notre Dame**, Polarization Engineering for High-Efficiency, High-Linearity mm-Wave Transistors
5:10 PM	RTM_3	Invited	Jose Jimenez	**Qorvo**, Optimizing a linear GaN technology for sub 6GHz applications
5:30 PM	RTM_4	Regular	Michael Mikulla	**Fraunhofer-Institut for Applied Solid State Physics**, Sub-100 nm III-N HEMTs – Operation at the higher mm-Wave Frequencies
5:45 PM	RTM_5	Invited	Matteo Meneghini	**University of Padova**, Defects and trapping in GaN power devices
6:05 PM	RTM_6	Regular	Liverios Lymperakis	**Max-Planck-Institut für Eisenforschung GmbH**, Ab-initio investigations of dislocations induced formation of nanopipes in GaN
CLOSURE DAY 1, 6:20 PM				

Tuesday 21st, June

RF AND POWER GAN 1				
8:30 AM	RPG1_1	Regular	Rajarshi Roy Chaudhuri	**Indian Institute of Science**, Hot Electron Interaction with C-doped GaN buffer and Resultant Gate Leakage Degradation in AlGaN/GaN HEMTs
8:45 AM	RPG1_2	Invited	Giorgia Longobardi	**Cambridge GaN Devices**, CGD monolithically integrated approach for power devices: The third way
9:05 AM	RPG1_3	Invited	Alex Lidow	**EPC**, GaN Integrated Circuits for More Efficient Motor Drives
9:25 AM	RPG1_4	Regular	Mattihas Moser	**Institut für Mikroelektronik Stuttgart**, PECVD SiNx passivation with more than 8 MV/cm breakdown strength for GaN-on-Si wafer stress management
9:40 AM	RPG1_5	Regular	Regine Mallwitz	**TUBraunschweig**, GaN HEMT lifetime modelling as a base for inverter life-time estimation
9:55 AM	RPG1_6	Invited	Romain Gwoziecki	**CEA**, Recent advance in GAN Power devices development at CEA-LETI
10:15 AM	**Coffee break**			
OPTICAL DEVICES and FABRICATION				
10:35 AM	ODF_1	Invited	Luca Sulmoni	**TU Berlin**, Realizing wide bandgap tunnel junctions for fully transparent MOVPE-grown UV LEDs
10:55 AM	ODF_2	Invited	Georg Bruederl	**ams OSRAM**, Blue and green GaN-based single mode laser for projection – status and challenges
11:15 AM	ODF_3	Invited	Amélie Dussaigne	**Leti**, High In content InGaN alloy by strain reduction: application to native RGB micro-display
11:35 PM	ODF_4	Regular	Rinat Yapparov	**KTH Royal Institute of Technology**, Dynamics and recombination of carriers around V-defects in InGaN quantum wells
11:50 PM	ODF_5	Regular	David Maria Tobaldi	**CNR Nanotech**, Structural and optical properties of ultrathin GaN layers in AlGaN barriers emitting in the UV region
12:05 PM	ODF_6	Invited	Thomas Weatherley	**EPFL**, Point defects and carrier diffusion length in InGaN/GaN quantum wells
12:25 PM	ODF_7	Regular	Muhammed Aktas	**Institute of High Pressure Physics**, InGaN laser diode with P-Cladding Layer Utilizing Polarization Doping
12:40 PM	ODF_8	Invited	Mayank Srivastava	**Indian Institute of Science,** Reliable Enhancement-Mode AlGaN/GaN HEMTs by p-type AlTiO Based Gate Stack Engineering
1:00 PM	**Lunch break**			
RF AND POWER GAN 2				
2:30 PM	RPG2_1	Invited	Michael Damman	**Fraunhofer-IAF**, GaN HEMT reliability of RF devices: A technology comparison
2:50 PM	RPG2_2	Invited	Jr-Tai Chen	**Swegan**, Recent progress in buffer-free GaN-on-SiC HEMT epitaxial heterostructures for microwave and power devices
3:10 PM	RPG2_3	Invited	Ingmar Kallfass	**Univ. Stuttgart and IMS CHIPS**, TBD
3:30 PM	RPG2_4	Regular	Samaneh Sharbati	**University of Southern Denmark**, Design of high breakdown voltage GaN-based vertical HFETs by the stepped p-Gan buried buffer layers
3:45 PM	RPG2_5	Regular	Vincenzo Barba	**EPC/ Polito**, Maximum Peak Current and Junction-to-Ambient delta-temperature Investigation in GaN FETs Parallel Connection
4:00 PM	**Coffee break**			
POWER and APPLICATIONS				
4:20 PM	PA_1	Invited	Gerald Deboy	**Infineon**, Value proposition of GaN devices in high and low power applications
4:40 PM	PA_2	Invited	Elison Matioli	**EPFL**, New technologies for efficient and integrated GaN power devices
5:00 PM	PA_3	Regular	Sayak Dutta Gupta	**Indian Institute of Science**, Physics-Based Approach for Mitigation of Dynamic RON in AlGaN/GaN HEMTs with C-doped buffer
5:15 PM	PA_4	Regular	Surya Elangovan	**National Chiao Tung University, Design and Characterization of 600 V**, 50 A Multichip-GaN HEMTs–based Cascode Power Module
5:30 PM	PA_5	Regular	Marc Orsatelli	**CEA**, Study of threshold voltage shift during multipulse hard-switching and impact on dynamic RDSON of GaN/Si power devices
5:45 PM	PA_6	Regular	Valentin Garbe	**Institute of Applied Physics**, TU Bergakademie Freiberg, Formation of Au-free Ohmic Contacts for AlGaN/GaN-HEMTs
6:00 PM	PA_7	Regular	Peter Fischer	**Institute of Applied Physics**, TU Bergakademie Freiberg, HRXRD strain and microstructure investigation of AlScN/GaN heterostructures and comparison to electric measurements of the 2DEG
6:15 PM	PA_8	Regular	Christian Miersch	**Fraunhofer Institute of Integrated Systems and Devices (IISB)**, Low damage etching of nitride semiconductors
CLOSURE DAY 2, 6:30 PM				
SOCIAL DINNER at 8:00 PM				

Wednesday 22nd, June				
RF AND POWER GAN 3				
8:30 AM	RPG3_1	Invited	Farid Medjdoub	**IEMN-CNRS**, High Power-Added-Efficiency millimeter-wave GaN HEMTs
8:50 AM	RPG3_2	Invited	Hao Yu	**IMEC**, Low-Field Transport Modeling to Enable Prediction and Optimization of GaN Heterostructure Sheet Resistance
9:10 AM	RPG3_3	Invited	Joachim Wuerfl	**FBH**, Novel AlN-based power and mm-wave transistors: Technological concepts and performance
9:30 AM	RPG3_4	Invited	Christian Koller	**Infineon**, Understanding Charge Transport and Trapping/Detrapping in GaN Power Devices
9:50 AM	RPG3_5	Regular	Marc Fouchier	**Attolight**, Dislocation type determination by cathodoluminescence
10:05 AM	RPG3_6	Regular	Giuseppe Greco	**CNR-IMM**, Threshold voltage instability under gate bias Stress in normally-off p-GaN HEMTs
10:20 AM	RPG3_7	Invited	Ferdinando Iucolano	**ST,** Emerging GaN-on Si Technologies: RF and Power Devices
10:40 AM	**Coffee break**			
POWER GaN and TECHNOLOGIES				
11:00 AM	DTC_1	Invited	Karen Geens	**IMEC**, Recent Advancements in Vertical GaN Device Development on Engineered Substrates
11:20 AM	DTC_2	Regular	Dan Ritter	**Technion**, On the GaN/AlN interface polarization charge and the polarization-compensating surface charge
11:35 AM	DTC_3	Regular	Pedro Fernandes Paes Pinto Rocha	**CEA Leti and CNRS/LTM,** Impact of Post-Deposition Anneal on ALD Al2O3/etched GaN Interface in Gate-First MOSc-HEMT Process Flow
11:50 AM	DTC_4	Regular	Itziar Alzuguren	**Ikerlan**, Low-Profile Bidirectional Wireless Battery Charger for PHEV/EV Vehicles
12:05 PM	DTC_5	Regular	Peter Ramvall	**Division of Digital Systems RISE Research Institutes of Sweden Lund/+Stockholm**, Growth of p-type GaN – The role of oxygen in activation of Mg-doping
12:25 PM	DTC_6	Invited	Enrico Zanoni	**University of Padova**, Degradation and reliability of GaN RF transistors
CLOSURE SESSION, 12:45 PM to 1:00 PM				