

# GaN Marathon 2024

## Preliminary Conference Program

June 10-12, 2024 | Verona, Italy

**Sunday June 9, 2024**

**Hotel Due Torri, Verona**

**REGISTRATION and WELCOME, from 16:00 to 18:00**

**Monday June 10, 2024**

**Hotel Due Torri, Verona**

**REGISTRATION and WELCOME**

**OPENING CEREMONY – Matteo Meneghini (General Chair)**

**10A - KEYNOTE SESSION – Chair: Enrico Zanoni**

8:00

9:00

9:30

10:00

10:30

11:00

**Coffee break**

**10B - OPTOELECTRONIC DEVICES 1 – Chair: Åsa Haglund**

11:20

11:40

12:00

12:20

12:40

13:00

**Lunch Break**

**(Pizzeria Da Pino, Piazza Bra, 15 min Walking Distance from the Conference)**

**10C - RF DEVICES 1 – Chair: Srabanti Chowdhury**

14:30

14:50

15:10

15:30

15:40

16:00

16:10

16:30

**Coffee break**

**10D - POWER DEVICES 1 – Chair: Farid Medjdoub**

16:50

17:10

17:30

17:40

18:00

18:20

18:30

18:50

**END OF DAY 1, 19:00**

**INVITED, COMMITTEE & SPONSOR DINNER (INVITATION ONLY) – MEETING AT 20:00 IN FRONT OF THE HOTEL**

Keynote	Hiroshi Amano	<b>Nagoya University</b> , Vertical devices on bulk nitride substrates
Keynote	Anthony Sanders	<b>Infineon Technologies</b> , Integrated GaN Partitioning: Challenges and Solutions
Keynote	Aurelien David	<b>Google</b> , Revisiting the physics of InGaN LEDs: Myths and facts
Invited	Ulrich Steegmueller	<b>ams OSRAM</b> , Game Changing semiconductor Technologies - From high-power to miniaturized and smart LEDs
Invited	Nicolas Grandjean	<b>Institute of Physics, School of Basic Sciences, EPFL</b> , Efficiency of III-nitride quantum wells: the importance of point defects
Invited	Rachel Oliver	<b>Department of Materials Science and Metallurgy, Cambridge University</b> , Microscopy of cubic nitrides for LEDs
Invited	Tim Wernicke	<b>Technische Universität Berlin, Institute of Solid State Physics</b> , Metalorganic vapor phase epitaxy of AlGaIn based UVC LEDs
Invited	Ulrich Schwarz	<b>TU Chemnitz, Institute of Physics</b> , Transition between quantum confinement and bulk-like behavior in wide polar quantum wells
Invited	Michael Mikulla	<b>Fraunhofer IAF – Inatech</b> , Advances in mm-Wave Gallium Nitride HEMTS and MMICs in Gain and Efficiency
Invited	Jose Jimenez	<b>Qorvo</b> , 20 lessons learnt on 20 years working in GaN-RF
Invited	Eduardo Marty Chumbes	<b>Raytheon Technologies</b> , Millimeter-wave ScAlN RF Transistors – Status and Future Direction
Student	Franco Ecolano	<b>University of Bologna</b> , TCAD analysis of the High-Temperature Reverse-Bias Stress on AlGaIn/GaN HEMT
Invited	Farid Medjdoub	<b>CNRS-IEMN</b> , The next millimeter-wave breakthrough coming up with advanced AlN/GaN transistors
Student	Aniruddhan Gowrisankar	<b>IISC</b> , Engineering a Low RF Loss HEMT-on-Silicon
Invited	Patrick Fay	<b>Department of Electrical Engineering, University of Notre Dame</b> , Advances in Polarization Engineering for Power, Linearity, and Thermal Management
Invited	Kalparupa Mukherjee	<b>CamGaN Devices</b> , Next generation of ICeGaN for superior no load and light load performance
Invited	Christian Huber	<b>Bosch</b> , Is vertical GaN on foreign substrates feasible? Insights from the YESvGaN project
Student	Shun Lu	<b>Nagoya University</b> , Recess-etching-free GaN p-MOSFET achieved by p-type contact to GaN/AlGaIn heterojunction with Mg-annealing process
Invited	Srabanti Chowdhury	<b>Stanford University</b> , Diamond on GaN: On achieving low temperature growth and low thermal boundary resistance
Invited	Davide Bisi	<b>Transphorm Inc.</b> , Latest Progress on GaN Cascode Devices for High-Power Applications
Regular	Lars Heuken	<b>Porsche</b> , Elevating Electric Sports Cars: GaN Power Semiconductors Unleashed
Invited	Karen Geens	<b>IMEC</b> , GaN power device fabrication for extension to higher voltages
Regular	Patrick Diehle	<b>Fraunhofer Institute for Microstructure of Materials and Systems IMWS</b> , Doping investigation of structured GaN devices by highly lateral resolved TOF-SIMS

# Tuesday June 11, 2024

## Hotel Due Torri, Verona

### 11A - POWER DEVICES 2 – Chair: Tim Wernicke

8:25	Student	Youssef Hamadou	<b>CNRS-IEMN</b> , High quality fully versus pseudo vertical GaN-on-Silicon pn diodes
8:35	Invited	Arno Stockman	<b>BelGaN</b> , Dynamic phenomena in 650V p-GaN technology
9:00	Regular	Nicolò Zagni	<b>University of Modena and Reggio Emilia</b> , Insights from Device Simulations into Trapping Effects in Vertical GaN Power Devices
9:10	Invited	Gianmauro Pozzovivo	<b>Infineon Technologies Austria AG</b> , GaN Power HEMTs: Next Level of Performance-to-Cost Ratio for Broader Market Adoption
9:30	Invited	Tetsuo Narita	<b>Toyota Central R&amp;D Labs.,Inc.</b> , Engineering of Channel Mobility, Threshold Voltage and Reliability in GaN MOSFETs Using AlSiO/AlN Gate Stacks Formed By Plasma-Enhanced Atomic Layer Deposition
9:50	Invited	Ferdinando Iucolano	<b>STMicroelectronics</b> , GaN Devices: Industrial trends and challenges
10:10	Regular	Yuji Zhao	<b>Rice University</b> , Selective area regrowth and doping of GaN, diamond and BN for power devices
10:20	Invited	Herbert Pairitsch	<b>Infineon Technologies Austria AG</b> , Power-GaN, the long path from materials science to innovative products

### Coffee break

### 11B – GROWTH AND CHARACTERIZATION 1 – Chair: Matteo Meneghini

11:00	Regular	Jan Kuzmik	<b>Slovak Academy of Sciences</b> , InN/InAlN Heterostructures for New Generation of Fast Electronics
11:10	Invited	Michal Bockowski	<b>Institute of High Pressure Physics of the Polish Academy of Sciences</b> , GaN-on-GaN technology from the perspective of materials science
11:30	Regular	Elke Meissner	<b>Fraunhofer Institute for Integrated Systems and Device Technology IISB</b> , Growth of thick freestanding 3-inch GaN crystals by vertical down-flow HVPE
11:40	Invited	Christof Mauder	<b>Aixtron SE</b> , 300 mm MOCVD Reactor Technology for Vertical GaN-on-Si Power Devices
12:00	Regular	Yingying Lin	<b>Nagoya University</b> , Anisotropic hole transport along [0001] and [11-20] direction in p-doped (10-10) GaN
12:10	Invited	Kazutada Ikenaga	<b>Taiyo Nippon Sanso Corporation</b> , Advancements in MOCVD and Supporting Equipment Technology for GaN
12:30	Regular	Gaudenzio Meneghesso	<b>University of Padova</b> , The GaN4AP projects: results and challenges

### Lunch break (Hotel Due Torri, Lobby)

### 11C - RF DEVICES 2 – Chair: Gaudenzio Meneghesso

13:40	Invited	Enrico Zanoni	<b>University of Padova</b> , Degradation of RF devices
14:00	Invited	Keisuke Shinohara	<b>Teledyne Scientific Company</b> , GaN HEMT scaling for millimeter-wave applications
14:20	Regular	Yvon Cordier	<b>Univ. Côte d'Azur, CNRS, CRHEA</b> , Evaluation of ScAlN/GaN HEMTs grown by ammonia source molecular beam epitaxy
14:30	Invited	Kozo Makiyama	<b>Sumitomo Electric Industries Ltd.</b> , High-power-density N-polar MIS GaN HEMT for power amplifiers
14:50	Invited	Jeong-Sun Moon	<b>HRL Laboratories</b> , Millimeter-wave Graded-channel GaN HEMT Technology for 5G and Beyond
15:10	Student	Hossein Yazdani	<b>Ferdinand-Braun Institute</b> , Si-implantation for Low Ohmic Contact Resistances in RF GaN HEMTs

Break

Follow ACME people to bus stop – Meeting Point in front of the Hotel

**Bus transfer to Lazise (45 min)**

## Dogana Veneta, Lazise

### POSTER SESSION

Break/Free Time during Dinner Setup (enjoy Lazise and the lakeside!)

### CONFERENCE DINNER (Dogana Veneta)

**First Bus leaves to Verona**

**Second Bus leaves to Verona**

17:00

19:00

20:00

22:45

0:00

## Wednesday June 12, 2024

### Hotel Due Torri, Verona

#### 12A - POWER AND RF DEVICES 3 – Chair: Arno Stockman

8:20	Invited	Malik Rasik Rashid	<b>IISC</b> , Physical Insights into the Processes Leading to Dynamic RON and its Mitigation Through Novel Surface Passivation Scheme
8:40	Invited	Han Wui Then	<b>Intel</b> , 50nm DrGaN in 3D Monolithic GaN MOSHEMT and Silicon PMOS Process on 300mm GaN-on-Si(111)
9:00	Invited	Elison Matioli	<b>Institute of Electrical and Micro-Engineering, EPFL</b> , Emerging Technologies for GaN-based RF and vertical power devices
9:20	Invited	Oliver Hilt	<b>Ferdinand-Braun-Institut</b> , AlN-based GaN channel HEMTs on AlN and SiC substrates
9:40	Regular	Carlo De Santi	<b>University of Padova</b> , p-GaN gate reliability physics

9:50

#### Coffee break

#### 12B - OPTOELECTRONIC DEVICES 2 – Chair: Ulrich Schwarz

10:10	Regular	Claude Weisbuch	<b>Ecole Polytechnique</b> , What we learned from photo and electro emission experiments in III-nitrides
10:20	Regular	Matteo Buffolo	<b>University of Padova</b> , Understanding UV-C LEDs degradation
10:30	Student	Lukas Uhlig	<b>Chemnitz University of Technology</b> , Fast lateral mode competition phenomena in InGaN broad-ridge laser diodes
10:40	Invited	Åsa Haglund	<b>Chalmers University of Technology</b> , Ultraviolet (light my way)...towards surface-emitting UV lasers
11:00	Regular	Saulius Marcinkevicius	<b>KTH Royal Institute of Technology</b> , Hole Injection into Quantum Wells of Long Wavelength GaN LEDs
11:10	Invited	Jan Ruschel	<b>Ferdinand-Braun-Institut</b> , Operation-induced degradation effects in AlGaIn-based UV LEDs
11:30	Regular	Bernd Witzigmann	<b>Friedrich-Alexander Universität Erlangen-Nürnberg (FAU)</b> , Impact of alloy fluctuations on optical gain in AlGaIn based UV lasers

#### CLOSING CEREMONY AND AWARDS – Matteo Meneghini (General Chair), 11:40 to 12:00

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