45th Workshop on Compound Semiconductor Devices and Integrated Circuits held in Europe

16th Expert Evaluation and Control of Compound Semiconductor Materials and Technologies

3-6 May 2022 | Ponta Delgada (São Miguel island - Azores), PORTUGAL
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Welcome

Dear Participants,

We are delighted to welcome you all to the **WOCSDICE EXMATEC 2022**: 45th Workshop on Compound Semiconductor Devices and Integrated Circuits held in Europe & 16th Expert Evaluation and Control of Compound Semiconductor Materials and Technologies, held during 3-6 May 2022 in the Portuguese city of Ponta Delgada (São Miguel island - Azores).

**WOCSDICE** is an annual workshop with a long standing tradition, as it was established in 1973. The meeting brings together internationally recognised researchers as well as promising early career scientists and engineers to disseminate state-of-the-art research findings in the areas of compound semiconductor materials, associated devices and integrated circuits. Last **WOCSDICE** meetings were organised in Aveiro - Portugal (2016), Las Palmas de Gran Canaria - Canary Islands - Spain (2017), Bucharest - Romania (2018), Cabourg - France (2019) and Bristol - United Kingdom (2021, virtual event).

**EXMATEC** has been based on biennial meetings for 25 years. The meeting sets itself apart by the presence of multidisciplinary well-known distinguished experts, young and talented researchers and business delegates from all over the world to present and exchange cutting-edge ideas and technologies in the fields of material fabrication, characterization and processing of compound semiconductors. Last **EXMATEC** meetings were organised in Aveiro - Portugal (2016), Bucharest - Romania (2018) and Bristol - United Kingdom (2021, virtual event).

The two complementary conferences represent a prime opportunity to acquire new knowledge as well as to exchange ideas on state-of-the-art research and the latest advancements on the topics that will be addressed:

- Compound semiconductors, including wide and ultrawide bandgap materials
- Advanced electronic, magnetic, optoelectronic, photonic semiconductor devices (materials, processing, characterization and modelling)
- Organic electronics
- Nanomaterials, including 2D materials, surfaces and interfaces (growth, characterization, theory and applications)
- Reliability aspects for materials, processes and devices
- Advanced semiconductor characterization and simulation techniques

Thank you for attending our event to share new and exciting results in the field of compound semiconductors! May you have a wonderful time in Ponta Delgada during **WOCSDICE EXMATEC 2022**!

*Joana Catarina Mendes (WOCSDICE Chair) Teresa Monteiro (EXMATEC Chair)*  
*Luis Nero Alves (WOCSDICE Co-Chair) Katharina Lorenz (EXMATEC Co-Chair)*
Committees

WOCSDICE Organising Committee

- Joana Catarina Mendes, Instituto de Telecomunicações - Aveiro, Portugal
- Luis Nero Alves, Instituto de Telecomunicações - Aveiro, Universidade de Aveiro, Portugal
- Pedro Cabral, Instituto de Telecomunicações - Aveiro, Universidade de Aveiro, Portugal
- Nuno Borges Carvalho, Instituto de Telecomunicações - Aveiro, Universidade de Aveiro, Portugal
- Henrique Leonel Gomes, Instituto de Telecomunicações - Lisboa, Universidade de Coimbra, Portugal
- Shusmitha Kyatam, Instituto de Telecomunicações - Aveiro, Universidade de Aveiro, Portugal
- Francisco Wallenstein Macedo, Estrutura de Missão dos Açores para o Espaço, Portugal
- Luís Côtimos Nunes, Instituto de Telecomunicações - Aveiro, Portugal
- José Carlos Pedro, Instituto de Telecomunicações - Aveiro, Universidade de Aveiro, Portugal
- Nuno Sá, Universidade dos Açores, Portugal

EXMATEC Organising Committee

- Teresa Monteiro, i3N, Universidade de Aveiro, Portugal
- Katharina Lorenz, INESC-MN, Instituto Superior Técnico, Portugal
- Maria Batista, i3N, Universidade de Aveiro, Portugal
- Maria do Rosário Correia, i3N, Universidade de Aveiro, Portugal
- Florinda Mendes da Costa, i3N, Universidade de Aveiro, Portugal
- Sérgio Magalhães, IPFN, Instituto Superior Técnico, Portugal
- Daniela Pereira, INESC-MN, Instituto Superior Técnico, Portugal
- Marco Peres, IPFN, Instituto Superior Técnico, Portugal
- Luís Rino, i3N, Universidade de Aveiro, Portugal
- Joana Rodrigues, i3N, Universidade de Aveiro, Portugal
- Miguel Sequeira, IPFN, Instituto Superior Técnico, Portugal
- Nikolai Sobolev, i3N, Universidade de Aveiro, Portugal
- Helena Vasconcelos, Universidade dos Açores, Portugal
- Dirkjan Verheij, INESC-MN, Instituto Superior Técnico, Portugal
- Sara Martins Vieira, Universidade de Aveiro, Portugal
Colombo Bolognesi ETH Zürich, Switzerland
Fernando Calle Universidad Politécnica de Madrid, Spain
Daniel Donoval Slovak University of Technology in Bratislava, Slovakia
Mircea Dragoman National Institute for R&D in Microtechnologies, Romania
Jean-Yves Duboz CNRS-CRHEA, France
Benito González Universidad de Las Palmas de Gran Canaria, Spain
Hans L. Hartnagel Technische Universität Darmstadt, Germany
Peter Kordos Slovak Academy of Sciences, Slovakia
Didier Lippens CNRS-IEMN, Université de Lille 1, France
Koichi Maezawa University of Toyama, Japan
Farid Medjdoub CNRS-IEMN, Université de Lille 1, France
Joana Catarina Mendes Instituto de Telecomunicações - Aveiro, Portugal
Gaudenzio Meneghesso Università di Padova, Italy
Elías Muñoz Universidad Politécnica de Madrid, Spain
Dimitris Pavlidis Florida International University, United States of America
Edwin Piner Texas State University, United States of America
Adrian Porch Cardiff University, United Kingdom
Jan Stake Chalmers University of Technology, Sweden
Michael Uren University of Bristol, United Kingdom
Andrei Vescan RWTH Aachen University, Germany
Hans-Joachim Würfl Ferdinand-Braun-Institut, Germany
Konstantinos Zekentes Foundation for Research and Technology - Hellas, Greece

Daniel Alquier Université de Tours, France
Daniel Araujo Universidad de Cádiz, Spain
Yvon Cordier CNRS-CRHEA, France
Mircea Dragoman National Institute for R&D in Microtechnologies, Romania
Eleftherios Iliopoulos University of Crete, Greece
Leszek Konczewicz Université Montpellier 2, France
Martin Kuball University of Bristol, United Kingdom
Mike Leszczynski Unipress PAS, Poland
Zbigniew Lisik Lodz University of Technology, Poland
Katharina Lorenz INESC-MN, Instituto Superior Técnico, Portugal
Koichi Maezawa University of Toyama, Japan
Teresa Monteiro i3N, Universidade de Aveiro, Portugal
Dimitris Pavlidis Florida International University, United States of America
Fabrizio Roccaforte CNR Institute for Microelectronics and Microsystems, Italy
Zlatko Sitar North Carolina State University, United States of America
Venue

The Conference will be held at

AZORIS ROYAL GARDEN
LEISURE & CONFERENCE HOTEL

GPS coordinates: 37° 44' 19.95” N, 25° 40' 36.77” W

The Azoris Royal Garden is located in the city of Ponta Delgada, in a privileged but yet quiet area just a few metres from the historical centre, on the largest island of the Azores, São Miguel. The spacious rooms for events, equipped with audiovisual material, provide an ideal setting for conferences and meetings. A charming Zen garden, ample lounge areas and two splendid swimming pools (indoor and outdoor) are just some of the wonderful options offered to guests to ensure an unforgettable experience of comfort, tranquillity and leisure time.

São Miguel island & city of Ponta Delgada

São Miguel is the biggest of the nine volcanic islands that comprise the Azores archipelago, with 62.1 km in length and 15.8 km at its maximum width. Nicknamed “The Green Island”, its landscape is characterised by extensive meadows and forested patches in the river valleys, often difficult to access, and the island’s highest point is Pico da Vara, with an altitude of 1,105 m. Ponta Delgada is the largest city of the entire archipelago and the executive capital of this Autonomous Region of Portugal. For further information: VisitAzores - Official Tourism Website of the Azores
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Low damage etching of AlGaN/GaN HEMT

SiO₂ and Si₃N₄ passivation layers by ICPECVD for GaN LED

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Made in Germany since 1990.

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- Widest spectral range and highest spectral resolution
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- **Control Loop Analysis**
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- **Analyzing Power Integrity on a PDN**
- **Measurements on 3-Phase Variable Frequency Drives**

The Portuguese Partner of Tektronix

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Company profile

Based on the comprehensive expertise of its founders and employees W&L Coating Systems GmbH is offering a variety of products and services to both industry and research organizations in the field of vacuum thin film deposition and surface modification:

- Competitive cylindrical cantilevered magnetron sputter cathodes of a very compact design for small and medium scale applications (< 1,000 mm in length, < 25 kW power)
- Linear, self-cleaning microwave PECVD source for in-line and web applications
- Microwave PECVD systems for the high and low temperature deposition of diamond films, diamond single crystals, vertical graphene and related materials
- Development of functional coatings, layer stacks and adaptation to customer substrate surfaces made from various materials such as metal, glass, ceramics and polymers
- Production of boron doped diamond coated electrodes for waste water treatment, ozone production and other electrochemical applications
Invited Speakers

Glorious future of Ga₂O₃ and related ultra-wide-band-gap materials
Ekaterine Chikoidze
CNRS, Université Paris-Saclay, France

Ga₂O₃ epilayers: phase selection, properties and applications
Roberto Fornari
Dept. of Mathematical, Physical and Computer Sciences, University of Parma, Italy

The (r)evolution of metal oxides: from material to device applications
Elvira Fortunato (1)
i3N/CENIMAT, Department of Materials Science, Universidade NOVA de Lisboa, Portugal

2D materials integration with wide bandgap semiconductors
Filippo Giannazzo
CNR-IMM, Catania, Italy

A link between Ga vacancies formation and growth conditions in MOVPE prepared GaN layers
Alice Hospodková
Institute of Physics of the Czech Academy of Sciences, Czech Republic

Realization of Medium-Voltage Vertical GaN PiN Diodes
Robert Kaplar
Sandia National Laboratories, Albuquerque NM, United States of America

Dynamic performance of power GaN devices: role of off-state stress and hot electrons
Matteo Meneghini
Department of Information Engineering, University of Padova, Italy

A Study of AlGaN/GaN HEMT Trapping Effects and Their Impact on RF Power Amplifier Wireless Infrastructure Applications
José Carlos Pedro
Instituto de Telecomunicações, Universidade de Aveiro, Portugal

Micro and NanoLEDs: Epitaxy, Processing, Applications
Andreas Waag (2)
Institute of Semiconductor Technology, Braunschweig University of Technology & Laboratory for Emerging Nanometrology (LENA), Germany

Efficient neural interfacing with microsystems: implication for functional rehabilitation
Blaise Yvert
Grenoble Institute of Neuroscience, Inserm and Univ. Grenoble Alpes, France

(1) Replaced by Daniela Nunes with the talk Sustainable metal oxide nanostructures for multifunctional applications
(2) Replaced by Klaas Strempel
Student Awards

The **WOCSDICE EXMATEC 2022 Awards** aim to encourage graduate students to attend the Conference and present their current research work. The Awards are sponsored by major Portuguese scientific and research entities by offering a prize money and certificates to the winners.

**Award Sociedade Portuguesa de Vácuo**  
for the Best Presentation in the area of  
*Vacuum-related Science and Technologies*  
Sponsored by [SOPORVAC](#)

**Award Sociedade Portuguesa de Física**  
for the Best Presentation in the area of  
*Physics and Applications*  
Sponsored by [SPfísica](#)

**Award Instituto de Telecomunicações**  
for the Best Presentation in the area of  
*Radio Frequency Devices and Applications*  
Sponsored by [IT](#)

**Award Associação RAEGE Açores**  
for the Best Presentation in the area of  
*Fundamental Research and Devices for Radioastronomy and Space Geodesy*  
Sponsored by [RAEGEiAz](#)

**Eligibility**

To be eligible for the Awards, the applicants had to meet the following criteria:

- Be enrolled in a recognised academic graduate degree program (Masters or Doctoral)
- Submit an abstract related to the mentioned areas in any of the Awards, as presenting author (speaker) and within the Abstract Submission Deadline
- Send all the requested documentation to the Conference Secretariat within a required deadline

**Selection criteria**

To pre-select the finalists, the jury panel took into account the quality of the submitted abstract, the originality and thoroughness of the applicant’s research work and the impact of the obtained results in the research area, as well as its potential regarding future developments. During the Conference, the jury panel will attend the finalists’ assigned talks to evaluate the quality of each oral presentation and the clarity in replying to questions from the audience, in order to select the Awards winners.

**Information for finalists and winners**

The Awards are not cumulative. The Awards winners will be announced and the Awards will be delivered during the **WOCSDICE EXMATEC 2022 Closing Ceremony** (beneficiaries of the Awards are expected to attend).
Presentation Guidelines

In order to ensure your presentation is successful and trouble-free, kindly follow the instructions given below.

Language
The Conference’s official language is English.

Duration of Presentations
- Invited: 25 minutes, followed by 5 minutes for Q&A (30 minutes total)
- Oral: 7 minutes, followed by 3 minutes for Q&A (10 minutes total)
Speakers must ensure that their presentation, including the period for questions and answers, takes no longer than the time stipulated in the Scientific Programme. The Chairpersons will be strict on timing.

Presentation Requirements and Supported Formats
PowerPoint type projection will be available and all the hardware (laptop computer, projector and screen, microphone and pointer) will be provided by the Conference Organisation, not only to ensure consistency in technical quality but also to allow quick and smooth transition between speakers. The computer system supports presentations made with the following software: MS Office; Open Office; Adobe PDF.

Conference Room
Only the provided laptop in the Conference room will be used for all presentations. Speakers can upload their presentation file to the laptop right before their Session begins, with the help of the Staff Team that will be permanently in the room. In alternative (although not advisable), speakers can bring the file in an USB storage device and run it on the provided laptop for their presentation.

Privacy Procedures
All presentations and associated files left in the Conference room’s laptop after the end of the Conference will be deleted and will not be provided to anyone, unless explicitly authorised by the author(s).
**Full Programme**

**2 May, Monday**

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<tr>
<td>17:30-18:00</td>
<td>Registration</td>
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<td>18:00-19:00</td>
<td>Welcome Reception</td>
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### Session 1: Sustainable Metal Oxide Nanostructures for Multifunctional Applications

**Chairpersons:** Teresa Monteiro & Luis Nero Alves

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<tr>
<th>Time</th>
<th>Speaker</th>
<th>Title</th>
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<tr>
<td>10:00-10:10</td>
<td>Daniela Nunes</td>
<td>Sustainable metal oxide nanostructures for multifunctional applications</td>
</tr>
<tr>
<td>10:10-10:20</td>
<td>Anamara Epa</td>
<td>Field effect transistors based on α-MoO₃ exfoliated crystals and exfoliated layers</td>
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<tr>
<td>10:20-10:30</td>
<td></td>
<td>Coffee break</td>
</tr>
<tr>
<td>10:50-11:20</td>
<td>Ekaterine Chikoidze</td>
<td>Glorious future for Ga₂O₃ and related Ultra Wide Band Gap materials</td>
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### Session 2: Ga₂O₃ Epilayers: Phase Selection, Properties, and Applications

**Chairpersons:** Katharina Lorenz & Sérgio Magalhães

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<th>Title</th>
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<tbody>
<tr>
<td>11:20-11:50</td>
<td>Roberto Fornari</td>
<td>Ga₂O₃ epilayers: phase selection, properties, and applications</td>
</tr>
<tr>
<td>11:50-12:00</td>
<td>Cordia Perrin</td>
<td>Deep electron traps in K-Ga₂O₃ crystal grown by floating zone</td>
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### Session 3: Gold Sponsor Presentation: Sentech

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<tr>
<td>15:50-16:00</td>
<td></td>
<td>Gold Sponsor Presentation: Sentech</td>
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### General Schedule

- **08:30:** Secretariat Opening
- **09:00:** Opening Ceremony
- **10:00-10:10:** Daniela Nunes: Sustainable metal oxide nanostructures for multifunctional applications
- **10:10-10:20:** Anamara Epa: Field effect transistors based on α-MoO₃ exfoliated crystals and exfoliated layers
- **10:20-10:30:** Coffee break
- **10:50-11:20:** Ekaterine Chikoidze: Glorious future for Ga₂O₃ and related Ultra Wide Band Gap materials
- **11:20-11:50:** Roberto Fornari: Ga₂O₃ epilayers: phase selection, properties, and applications
- **11:50-12:00:** Cordia Perrin: Deep electron traps in K-Ga₂O₃ crystal grown by floating zone
- **12:00-12:10:** Filip Guzmann: Growth of gallium oxide on 4H-SiC using liquid injection MOCVD
- **12:10-12:20:** Marco Feres: Ga₂O₃ Nano-Membranes Produced by a New Method: Based on ion Implantation
- **12:20-12:30:** Vanya Darchikheva: Terahertz Electric Paramagnetic Resonance Spectroscopy Ellipsometry for Characterization of Defects in Ultra-Wide Bandgap Semiconductors
- **12:30-14:00:** Lunch

### Other Sessions

- **09:00-09:30:** Opening Ceremony
- **14:30-14:40:** Klaas Strempel: Micro and NanolEDs: Epitaxy, Processing, Applications
- **14:40-14:50:** Karolis Kazlauskas: High Triplet Energy Hosts for Blue Thermally Activated Delayed Fluorescence OLEDs
- **14:50-15:00:** Liad Tadmor: Atomic layer deposited Al₂O₃ on n-GaN post process annealing at elevated temperatures
- **15:00-15:10:** Julien Bosseler: Anisotropic mobility in AlGaN/GaN heterostructure with thin GaN on AlN/Sapphire template
- **15:10-15:20:** Kavun Karami: Investigation of Al₂O₃, Si₃N₄, and SiO₂ used for surface passivation and gate dielectric on AlGaN/GaN metal-oxide-semiconductor high electron mobility transistors
- **15:20-15:30:** Henrique Guedes: Anisotropic self-assembled multilayer films used simultaneously as dielectric and conducting channel material: A novel approach to fabricate solid-state electrolyte gate organic transistors
- **15:30-15:40:** Dirkjan Verheij: Radiation detectors based on GaInN core-shell p-n junction microsensors
- **15:40-15:50:** Alejandro Gallego: Efficiency enhancement in superlattice-based solar cells by controlled Si composition profile
- **15:50-16:00:** Marco Nicoletto: Characterization and Modelling of Quantum Efficiency in GaN–GaN Multi-Quantum Well (MQW) Solar Cells
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<tr>
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<th>Session A</th>
<th>Lecture</th>
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<tbody>
<tr>
<td>08:30</td>
<td>Secretariat Opening</td>
<td>Alice Hospodková: A link between Ga vacancies formation and growth conditions in MOVPE prepared GaN layers</td>
</tr>
<tr>
<td>09:00-09:30</td>
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<td>Mike Lessczynski: X-ray Diffraction in study of InGaN Quantum Wells Grown on Implanted GaN</td>
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<tr>
<td>09:30-09:40</td>
<td>Session 4A</td>
<td>Sísó Magalhães: Combining X-ray real and reciprocal spaces mapping techniques to explore the epitaxial growth of nitrides, oxides and tin compounds</td>
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<td>09:40-09:50</td>
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<td>Lvetis Lymperakis: Formation and properties of V-pit defects on wurtzite GaN polar surfaces from first principles</td>
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<tr>
<td>10:00-10:10</td>
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<td>Lucía Nieto: Optimization of AlN growth conditions by RF-sputtering on silicon substrates</td>
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<td>10:10-10:20</td>
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<td>Rada Exvardi: Investigation on GaN channel thickness downscaling in high electron mobility transistor structures grown on AlN bulk substrate</td>
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<tr>
<td>10:20-10:50</td>
<td></td>
<td>Coffee break</td>
</tr>
<tr>
<td>10:50-11:00</td>
<td></td>
<td>Corinne Elias: Influence of the temperature on growth by ammonia source molecular beam epitaxy of wurtzite phase ScAlN on AlN.</td>
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<tr>
<td>11:00-11:10</td>
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<td>Mikołaj Grabowski: Effects of point defects in GaN layers with different doping types on the properties and decomposition of InGaN/GaN QWs.</td>
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<td>11:10-11:20</td>
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<td>Eva Groska: Examination of the indium concentration fluctuations in InGaN/GaN quantum wells.</td>
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<td>11:20-11:30</td>
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<td>Tian Khee Ng: ( \text{P}(\text{Ga}, \text{Al}) )_2 grown using oxygen plasma-assisted molecular beam epitaxy</td>
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<td>11:30-11:40</td>
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<td>Andras Turo: Dependence of diffusion of Si and Mg atoms implanted into GaN on TDD.</td>
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<td>11:40-11:50</td>
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<td>Sylvia Hagedorn: Dilution half-loop suppression by Si-doping in AlN homoepitaxy on high-temperature annealed AlN.</td>
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<tr>
<td>11:50-12:00</td>
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<td>Alena Lamela: Ca-covered centres in diamond: optical and computation study</td>
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<tr>
<td>12:00-12:10</td>
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<td>Daniel Araújo: Boron doping and dilution generation mechanisms in diamond epilayers</td>
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<tr>
<td>12:10-12:20</td>
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<td>Fernando Lloret: MW PE CVD-growth boron-doped diamond coating on carbon fibers for sensor applications</td>
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<tr>
<td>12:20-12:30</td>
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<td>Maria S. Batista: Analysis of persistent luminescence of C-doped and galliumnitride phosphor.</td>
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<tr>
<td>12:30-13:00</td>
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<td>Lunch</td>
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<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>14:00-14:30</td>
<td></td>
<td>Blaise Yeort: Efficient neural interfacing with microsystems: implication for functional rehabilitation</td>
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<tr>
<td>14:30-14:40</td>
<td></td>
<td>Scott Greenhorn: a-SiC:H Characterization Towards Optimal MEA Neural Interface Passivation</td>
</tr>
<tr>
<td>14:40-14:50</td>
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<td>Hans E. Hartnagel: Detection of the Corona Virus by Terahertz Spectroscopy based on Quantum Cascade Sources</td>
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<td>14:50-15:00</td>
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<td>Yahya Fu: High-gain High-sensitivity AlGaN/GaN Ultraviolet Photodetector with Effective Photoelectron Collection Plates</td>
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**Session 4B**
Chairpersons: Mike Leszczynski & Roberto Fornari

- Blaise Yeort
  Efficient neural interfacing with microsystems: implication for functional rehabilitation

- Scott Greenhorn
  a-SiC:H Characterization Towards Optimal MEA Neural Interface Passivation

- Hans E. Hartnagel
  Detection of the Corona Virus by Terahertz Spectroscopy based on Quantum Cascade Sources

- Gottfried Stasser
  High-speed quantum cascade and interband cascade detectors

- Akshay M. Anandhram
  THz InGaAs/GaAs DHBT Characterization from 300 to 7 K

**Gold Sponsor Presentation: Tektronix/ADMedida**

- Coffee break
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<td>Robert Kaplan: Realization of Medium-Voltage Vertical GaN PIN Diodes</td>
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<td>Matej Matuš: Defect Distribution Study of p+n GaN diode for High Power Applications</td>
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<td>Shaumitha Rajam: Improving the Thermal Management of Power LED Arrays with Diamond</td>
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<td>Danilo Crippa: 200mm Silicon Carbide Epi-fan for Power Devices: Equipment and Processa Perspective</td>
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<td>Manuel Fregolent</td>
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<td>Aniket Dhongde</td>
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**Closing Ceremony**

**Student Awards Ceremony**

**Hans L. Hartnagel**

WOCSIDICE & EXMATEC: past, present and future
Social Programme

The Lunch tickets and the invitations for the Island Tour and the Gala Dinner are inserted in each participant’s identification badge. Kindly make sure to have the correct ticket/invitation before attending each occasion.

The Conference’s Social Programme includes three activities, carefully prepared to offer a glance of the rich Azorean gastronomy and the amazing landscapes found in São Miguel island:

**Registration & Welcome Reception**

2 May, Monday | 17:30-19:00

The Welcome Reception will take place the day before the Conference starts at the *Azoris Royal Garden* Hotel, allowing the participants to first get to know our Conference venue in a relaxed setting. Either in the charming Zen garden or the ample lounge areas the Hotel offers, it will be a great opportunity to get together with old friends and meet new people. The Conference Secretariat will open at 17:30 to receive all participants, confirm registrations and hand over the Conference kit, while drinks and appetisers will be served between 18:00 and 19:00.

**Island Tour**

4 May, Wednesday | 16:30-19:00

The Island Tour will depart from the *Azoris Royal Garden* Hotel at 16:30 towards the west side of the island. The first stop will be in the mystical Sete Cidades, one of the 7 Natural Wonders of Portugal and a place filled with legends, where it is possible to see from the Vista do Rei lookout the beautiful Green and Blue twin lakes, paired together by a bridge. The tour will proceed to the hidden Santiago lake and the breathtaking Pico do Carvão viewpoint, that provides a spectacular panoramic view across the northern and southern coasts, as well as the centre of the island. Next there will be a visit to a pineapple plantation, to learn about the different methods used to produce a fruit considered to be the best of its kind in the entire world. The last stop will be in a very special and secret place, for a taste of Azorean cheese and wines. The tour will end upon returning to the Hotel in Ponta Delgada around 19:00.

**Gala Dinner**

5 May, Thursday | 17:00-22:00

The tour to the Gala Dinner will depart from the *Azoris Royal Garden* Hotel at 17:00 towards the Furnas valley, one of the most important geosites in the archipelago, famous for its thermal pools and natural mineral springs. Located in the east side of the island inside a huge and still active volcanic crater, the Furnas lagoon offers quite a spectacle to its visitors in the form of geothermal holes called Fumarolas, that expel boiling mud and steam up in the air. Right next to them are the remarkable steaming holes, used for centuries by the local population to cook their food, like the Cozido das Furnas. It will be in the *Terra Nostra* Hotel that all participants will have a taste of this iconic dish, right after a welcoming cocktail that will start the evening. The dinner will end upon returning to the Hotel in Ponta Delgada around 22:00.
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3 May, Tuesday

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  Sustainable metal oxide nanostructures for multifunctional applications
  *D. Nunes, A. Pimentel, M.L. Matias, E. Fortunato, R. Martins*

  Field effect transistors based on α-MoO₃ exfoliated crystals and pseudo-layers
  *Daniela R. Pereira, Chamseddine Bouhafs, Sónia O. Pereira, Carlos Díaz-Guerra, Marco Peres, António J. S. Fernandes, Bohdan Kulyk, Florinda M. Costa, M. Rosário P. Correia, Eduardo Alves, Susana Cardoso, Paulo P. Freitas, Katharina Lorenz*

  The Role of Nitrogen intercalation on the electrooxidation of H₂O₂ Sensor
  *Ammara Ejaz, Manuel Pelayo Garcia, Des Gibson, Carlos García Nuñez*

SESSION 2
Chairpersons: Katharina Lorenz & Sérgio Magalhães

- **Invited Talk** -
  Glorious future for Ga₂O₃ and related Ultra Wide Band Gap materials
  *Ekaterine Chikoidze*

- **Invited Talk** -
  Ga₂O₃ epilayers: phase selection, properties, and applications
  *Roberto Fornari*

  Deep electron traps in β-Ga₂O₃ crystal grown by floating zone
  *Coralie Perrier, Yosra Mzali, Aboulaye Traoré, Toshimitsu Ito, Hitoshi Umezawa, Etienne Gheeraert, Philippe Ferrandis*

  Growth of gallium oxide on 4H-SiC using liquid-injection MOCVD
  *Filip Gucmann, Kristina Hušeková, Edmund Dobročko, Peter Nádaždy, Javad Keshtkar, Fridrich Egyenes, Miroslav Mikolášek, Karol Fröhlich, Milan Ťapajna*

  Ga₂O₃ Nano-Membranes Produced by a New Method Based on Ion Implantation
  *Marco Peres, Duarte. M. Esteves, Daniela R. Pereira, Chamseddine Bouhafs, Luis F. Santos, Luis C. Alves, Eduardo Alves, Katharina Lorenz*

  Terahertz Electron Paramagnetic Resonance Spectroscopic Ellipsometry for Characterization of Defects in Ultra-Wide Bandgap Semiconductors
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Micro and NanoLEDs: Epitaxy, Processing, Applications
Andreas Waag, Jan Gülink, Georg Schöttler, Steffen Bornemann, Stefan Wolter, Hendrik Spende, Irene Manglano Clavero, Christoph Margenfeld, Lukas Peters, Jana Hartmann (Klaas Strempel)

High Triplet Energy Hosts for Blue Thermally Activated Delayed Fluorescence OLEDs
Dovydas Banevičius, Francesco Rodella, Gediminas Kreiza, Saulius Juršėnas, Peter Strohriegl, Karolis Kazlauskas

Atomic layer deposited Al₂O₃ on n-GaN post process annealing at elevated temperatures
Liad Tadmor, Eldad Bahat Treidel, Sofie Vandenbroucke, Oliver Hilt, Joachim Würfl

Investigation of Al₂O₃, Si₃N₄ and SiO₂ used for surface passivation and gate dielectric on AlGaN/GaN metal-oxide-semiconductor high electron mobility transistors
Kaivan Karami, Sanna Taking, Afesomeh Ofiare, Maira Elksne, Aniket Dhongde, Abdullah Al-Khalidi, Edward Wasige

Anisotropic self-assembled multilayer films used simultaneously as dielectric and conducting channel material: A novel approach to fabricate solid-state electrolyte gate organic transistors
Gabriel Gadl, Maria Luisa Braunger, Varlei Rodrigues, Antonio Riul Jr, Henrique Leonel Gomes

Radiation detectors based on GaN core-shell p-n junction microwires
Dirkjan Verheij, Luís Cercqueira Alves, Marco Peres, Susana Cardoso, Eduardo Alves, Christophe Durand, Joël Eymery, Gwenolé Jacopin, Jorge Fernandes, Katharina Lorenz

Efficiency enhancement in superlattice-based solar cells by controlled Sb composition profile

Characterization and Modelling of Quantum Efficiency InGaN-GaN Multi-Quantum Well (MQW) Solar Cells
Marco Nicoletto, Alessandro Caria, Carlo De Santi, Matteo Buffolo, Xuanqi Huang, Houqiang Fu, Hong Chen, Yuji Zhao, Gaudenzio Meneghesso, Enrico Zanoni, Matteo Meneghini

- Invited Talk -

A link between Ga vacancies formation and growth conditions in MOVPE prepared GaN layers
Alice Hospodková, Jakub Čížek, František Hůjek, Tomáš Hubáček, Filip Dominec, Karla Kulďová, M.O. Liedke, M. Butterling, A. Wagner

X-ray Diffraction in study of InGaN Quantum Wells Grown on Implanted GaN
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Combining X-ray real and reciprocal spaces mapping techniques to explore the epitaxial growth of nitrides, oxides and tin compounds
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Formation and properties of V-pit defects on wurtzite GaN polar surfaces from first principles
Su-Hyun Yoo, Liverios Lymperakis, Jörg Neugebauer

Optimization of AlN growth conditions by RF-sputtering on silicon substrates
Lucía Nieto, Fernando Lloret, Juan Jesús Gallardo, Daniel Araujo

Investigation on GaN channel thickness downscaling in high electron mobility transistor structures grown on AlN bulk substrate
Reda Elwaradi, Catherine Bougerol, Jash Mehta, Maud Nemoz, Farid Medjdoub, Yvon Cordier

SESSION 4B
Chairpersons: Mike Leszczyński & Roberto Fornari

Influence of the temperature on growth by ammonia source molecular beam epitaxy of wurtzite phase Sc$_x$Al$_{1-x}$N alloy on GaN
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Effects of point defects in GaN layers with different doping types on the properties and decomposition of InGaN/GaN QWs
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Dependence of diffusion of Si and Mg atoms implanted into GaN on TDD
Ewa Granka, Andrzej Turos, Mikolaj Grabowski, Robert Czecknecki, Michal Leszczyński

Dislocation half-loop suppression by Si-doping in AlN homoepitaxy on high-temperature annealed AlN
Anna Mogilatenko, Sebastian Walde, Sylvia Hagedorn, Carsten Netzel, Chia-Yen Huang, Markus Weyers

Ca colour centres in diamond: optical and computational study
Afonso Lamelas, Joana Rodrigues, Lino Pereira, João Correia, Ulrich Wahl, Teresa Monteiro, Vítor Amaral

Boron doping and dislocation generation mechanisms in diamond epilayers
Daniel Araujo, Fernando Lloret, Gonzalo Alba, M. Paz Alegre, M. Pilar Villar

MW PE CVD-growth boron-doped diamond coating on carbon fibers for sensor applications
Fernando Lloret, Josué Millán-Barba, Marina Gutiérrez, Daniel Araujo

Analysis of persistent luminescence of Cr-doped zinc gallogermanate phosphor
Maria S. Batista, Joana Rodrigues, Maria S. Relvas, Julia Zanoni, Ana V. Girão, Luís Rino, Ana Pimentel, Florinda M. Costa, Sônia O. Pereira, Teresa Monteiro

SESSION 5
Chairpersons: Matteo Meneghini & José Carlos Pedro

- Invited Talk -
Efficient neural interfacing with microsystems: implication for functional rehabilitation
Blaise Yvert
a-SiC:H Characterization Towards Optimal MEA Neural Interface Passivation
Scott Greenhorn, Konstantinos Zekentes, Edwige Bano, Valérie Stambouli, Andrei Uvarov

Detection of the Corona Virus by Terahertz Spectroscopy based on Quantum Cascade Sources
Hans L. Hartnagel

High-speed quantum cascade and interband cascade detectors
Gottfried Strasser, Johannes Hillbrand, Leonard Mattieu Krüger, Jonas Heidrich, Sandro Dal Cin, Hedwig Knöting, Maximilian Beiser, Aaron Maxwell Andrews, Robert Weiβ, Johannes Koeth, Benedikt Schwarz, Ursula Keller

THz InP/GaAsSb DHBT Characterization from 300 to 7 K
Akshay M. Arabhavi, Filippo Ciabattini, Sara Hamzeloui, Ralf Flückiger, Tamara Saranovac, Daxin Han, Diego Marti, Giorgio Bonomo, Rimjhim Chaudhury, Olivier Ostinelli, Colombro R. Bolognesi

Enhancement of terahertz detection using asymmetric dual grating antenna coupled FET
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On the Subthreshold Behaviour of GaN and InGaAs HEMTs as sub-THz detectors
Gaudencio Paz-Martínez, Ignacio Íñiguez-de-la-Torre, Héctor Sánchez-Martín, Beatriz García Vasallo, Javier Mateos, Tomás González

High-gain High-sensibility AlGaN/GaN Ultraviolet Photodetector with Effective Photocurrent Collection Plates
Yuhan Pu, Yung C. Liang

Bias-Free Operation of GaInAsSb/InP High Speed Uni-Traveling Carrier Photodiodes
Rimjhim Chaudhary, Akshay M. Arabhavi, Olivier Ostinelli, C.R. Bolognesi

5 May, Thursday

SESSION 6
Chairpersons: Yvon Cordier & Marco Peres

- Invited Talk -

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Jozef Novák, Agáta Laurenčíková, Peter Eliáš, Stanislav Hasenöhrl, Michaela Sojková, Jaroslav Kováč jr., Jaroslav Kováč

Ultrathin Graphene Foam Based Flexible Piezoresistive Pressure Sensors
Carlos García Nuñez, Ammara Ejaz, Marco Caffio, Des Gibson

Polarity of Self-induced GaN Nanowires on Si(111) Studied by Kelvin Probe Force Microscopy: Influence of Si Substrate Preparation
Marta Sobanska, Nuria Garro, Ana Cros, Zbigniew R. Zytkiewicz

ZrN nucleation layer as a buried mirror and metallic bottom contact for GaN nanowires grown by plasma-assisted MBE
Marta Sobanska, Aleksandra Wierzbicka, Krzysztof K. Korona, Krystyna Gołaszewska, Zbigniew R. Zytkiewicz

Growth of Au-Nano particles by ion implantation
A. Ribeiro, M. Dias, M. Peres, J. Borges, F. Vaz, E. Alves, N. Catarino
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Study of Ni Schottky barrier on GaN epilayers grown on bulk substrates
Fabrizio Roccaforte, Giuseppe Greco, Filippo Giannazzo, Patrick Fiorenza, Salvatore Di Franco, Pierre-Marie Coulon, Eric Frayssinet, Yvon Cordier

Selective sublimation of GaN and regrowth of AlGaN to co-integrate enhancement mode with depletion mode high electron mobility transistors
Thi Huong Ngo, Rémi Comyn, Sébastien Chenot, Julien Brault, Maud Nemoz, Philippe Vennéguès, Benjamin Damilano, Stéphane Vézian, Éric Frayssinet, Flavien Cozette, Nicolas Defrance, François Lecourt, Nathalie Labat, Hassan Maher, Yvon Cordier

Molecular beam epitaxy grown GaN-nanowires-based p-i-n structures on a diamond substrate via Ti pre-orienting layer
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Growth, Characterization and Processing of GaN/AlGaN Heterostructures for p-Channel Heterojunction Field Effect Transistors
Carsten Beckmann, Jens Wieben, Thorsten Zweipfennig, Jasmin Ehrler, Arno Kirchbrücher, Zineng Yang, Robert Stamm, Holger Kalisch, Andrei Vescan

DC Characteristics of GaN Nanowire Vacuum Field-Emission Transistors
G. Doundoulakis, D. Pavlidis

SESSION 8
Chairpersons: Filippo Giannazzo & Dimitris Pavlidis

- Invited Talk -
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Robert Kaplar, Luke Yates, Brendan Gunning, Mary Crawford, Jeffrey Steinfeldt, Michael Smith, Vincent Abate, Jeramy Dickerson, Andrew Armstrong, Andrew Binder, Andrew Allerman

EBIC analysis of semi-insulating GaN/Si-doped GaN-on-GaN test structures for vertical GaN transistors
Juraj Priesol, Alexander Šatka, Aleš Čhvála, Peter Šichman, Stanislav Hasenohrl, Ján Kuzmík, František Uherek

Defect Distribution Study of p+/n- GaN diode for High Power Applications
Matej Matus, Juraj Marek, Karen Geens, Matteo Borga, Hu Liang, Stefaan Decoutere, Herwig Hahn, Michael Heuken, Lubica Stuchlikova

Improving the Thermal Management of Power LED Arrays with Diamond
Shusmitha Kyatam, Luis Rodrigues, Luis Nero Alves, Joana Catarina Mendes

200mm Silicon Carbide Epitaxy for Power Devices: Equipment and Process Perspective
Danilo Crippa, Mustafa Abdelmoneim, Mani Azadmand, Andrea Brogi, Francesco Corea, Laura Gobbo, Marco Mauceri, Stefano Polli, Silvio Preti, Luca Specker, Carmelo Vecchio, Marco Puglisi
Electro-Thermal Simulation Analysis and Optimization of SiC Power MOSFET under UIS Test Condition
Aleš Chvála, Juraj Marek, Jozef Kozárik, Angelo Alberto Messina, Vincenzo Vinciguerra, Daniel Donoval

Treasure Map for Normally OFF SiC Power FinFETs
Daniel Krebs, Dick Scholten, Joachim Rudhard, Jens Baringhaus

Electrical performance degradation of power p-GaN HEMTs exposed to repetitive short circuit conditions
Juraj Marek, J. Kozárik, M. Minárik, A. Chvála, Lubica Stuchlikova

6 May, Friday

SESSION 9A
Chairpersons: Edwin Piner & Fabrizio Roccaforte

- Invited Talk -
A Study of AlGaN/GaN HEMT Trapping Effects and Their Impact on RF Power Amplifier Wireless Infrastructure Applications
José Pedro, João Gomes, Luis Nunes, Filipe Barradas

Radiation-tested, High-Efficiency, GaN-on-Diamond Power Amplifiers and Satellite Radios
Daniel Francis, Brian Loran, Marty Yarborough, Larry Witkowski, Paul Saunier, Kris Kong, Ty Mitchell, Felix Ejeckam

Deep Levels and Threshold Voltage Instability in Vertical α-Plane Oriented GaN MISFETs

Steep-Slope, Fast Switching and High frequency InAs Impact Ionization MOSFETs Operating at Low $V_{DS}$
Daxin Han, Giorgio Bonomo, Diego C. Ruiz, Akshay M. Arabhavi, Olivier J. S. Ostinelli, Colombo R. Bolognesi

High performance of AlGaN/GaN HEMTs using buffer-free GaN on SiC structure
Aniket Dhongde, Sanna Taking, Maira Elksne, Afesomeh Ofiare, Kaivan Karami, Mahmud Dwidar, Abdullah Al-Khalidi, Edward Wasige

Sub-Micron Thick GaN-on-Si HEMTs with More than 7.5 MV/cm Buffer Breakdown Field
Elodie Carneiro, Stéphanie Renesson, Sébastian Tamariz, Fabrice Semon, Farid Medjdoub

SESSION 9B
Chairpersons: Joana Catarina Mendes & Hans L. Hartnagel

Electron and hole trapping in the threshold voltage instability of normally-off p-GaN-gate HEMTs
Giuseppe Greco, Patrick Fiorenza, Filippo Giannazzo, Maurizio Moschetti, Cristina Miccoli, Ferdinando Iucolano, Fabrizio Roccaforte

Physical Analysis of Current Mechanisms in High-Frequency GaN-on-SiC Schottky Barrier Diodes
Beatriz Orfao, Giuseppe Di Gioia, Beatriz García-Vasallo, Susana Pérez, Javier Mateos, Yannick Roelens, Yvon Cordier, Mohammed Zaknoune, Tomás González

T-gate Technology Towards a Higher Cut off Frequency in GaN HFETs
Hossein Yazdani, Natalia Kemf, Joachim Würfl

Flash-like AlGaN/GaN/AlGaN Double Heterostructure MISHFET
Carsten Beckmann, Arno Kirchbrücher, Thorsten Zweipfennig, Jens Wieben, Holger Kalisch, Andrei Vescan

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