

# Preface

Advanced wide bandgap nitride semiconductors and heterostructure devices are unique contenders for future leading-edge electronic systems due to their outstanding material properties with respect to speed, power, efficiency, linearity, and robustness. This has led to excellent research and development results worldwide. At the same time, the material properties are still challenging when compared with any other material system.

For more than 10 years there have been significant activities in Europe on microwave and RF GaN devices, circuits, and applications through a number of European national and international projects. The aim of this special issue is to give an overview of the main achievements of those projects. It consists of 14 papers, both invited and contributed. New challenges are coming up with the insertion of indium into the material base, with even higher frequencies addressed, and with systems being deployed in Europe based on the continuous ongoing progress.

We hope that the readers enjoy this overview.

Rüdiger Quay and Sylvain Delage



**Rüdiger Quay** received the Diplom degree in physics from Rheinisch-Westfälische Technische Hochschule (RWTH), Aachen, Germany, in 1997, and a second Diplom in economics in 2003. He received his doctoral degree in technical sciences (with honors) from the Technische Universität Wien, Vienna, Austria. In 1996, he was a visit-

ing researcher at Los Alamos National Laboratory, New Mexico, and, in 1999, he was visiting at the University of Illinois at Urbana Champaign. In 2009 he received the *venia legendi* in microelectronics from the Technische Universität Wien.

He is currently a group leader with the Fraunhofer Institute of Applied Solid-State Physics, Freiburg, Germany, heading the RF-devices and characterization group.

He has authored and coauthored over 110 refereed publications and three monographs, one of them on gallium nitride electronics. He is a member of the IEEE, MTT, and chairman of MTT-6: *Microwave and Millimeter Wave Integrated Circuits*.



**Sylvain Delage** obtained his Ph.D. from University Paris VII in 1985 for his work carried out at CNET-Meylan on the demonstration of monolithic Si/CoSi<sub>2</sub>/Si metal base transistor grown by molecular beam epitaxy. Afterwards he was for 2 years with IBM T.J. Watson Research Center as a research staff member, where he participated in the first demonstration of Si/SiGe HBT, which has been later developed and manufactured worldwide by major semiconductor companies.

In 1988, he joined the Central Research Laboratory of Thomson-CSF, now Thales Research and Technology, where he was in charge of the Power Transistor Programme for Microwave Applications. This work, carried out with a team of about 15 people, gave rise to the demonstration of InGaP/GaAs HBT devices and microwave circuits. This technology has been successfully transferred to UMS, the Thales-EADS GmbH joint venture dedicated to the production of microwave components. He is now working with the Alcatel Thales III-V Lab, where he is now in charge of the Microelectronics Group, which includes about 25 permanent scientists working on GaN and InP materials and devices. He has been in charge or strongly involved in various European or French projects: AIMS, Korrigan, GAMMA, UltraGaN, MIGHT, EURONIM, TERAGAN, UltraGaN, MORGaN, etc. Sylvain Delage was formerly a Member of the French National Committee of Research and a member of the Technical Program Committee of the EuMIC conference. He has contributed to over 100 publications and 25 patents.