

# PROFESSIONAL RESUME OF KONSTANTINOS ZEKENTES

## CAREER OBJECTIVE

Research and development in the area of compound semiconductors and microelectronics. The last decade the emphasis was devoted in SiC device technology development for microwave and power applications as well as for the development of SiC based nanowire transistors.

## EDUCATION

## PROFESSIONAL BACKGROUND

Jan. 2001- present      Principal Researcher at MRG-IESL-FORTH.

His current research interests entail:

- (a) power devices, to develop diodes and transistors based on 4H-SiC for high as well as low frequency applications,
- (b) physical characterization, to determine the optimum methods for evaluating the material quality prior, during and after the SiC device processing,
- (c) nanotechnology, to develop SiC-based Nanowire Field Effect Transistors (SiC-NWFETs) with emphasis on material grown by Molecular Beam Epitaxy (MBE).

The objective of his work is to coordinate and supervise the MRG's effort for the development of SiC-related technology for elaborating high power and high frequency devices.

1995-2000      *Associate Researcher* at MRG-IESL-FORTH.

He conducted research relative to the:

- (a) MBE SiC/Si heteroepitaxy,
- (b) the development of high frequency-high power diodes based on 4H-SiC.
- (c) the fabrication of Quantum Well Infrared Photodetectors (QWIP) based on III-V materials (until 1999).

Dr. Zekentes was also one of the organizers of the master degree on "Microelectronics-Optoelectronics" of the Dept. of Physics which has been launched in September 1998.

1991-1995      *Physicist-Researcher* at MRG-IESL-FORTH

Until January 1995 Dr. Zekentes conducted basic research in Molecular Beam Epitaxy (MBE) and contributed in the investigation of devices like Hall-effect sensors (now commercially available by Schlumberger, model CENTRON) and PM-HEMTs. The MBE-related research effort concentrated on growth of :

- I) InGaAs and InAlAs layers on InP substrates,
- II) GaAs/GaAlAs p-i-n modulators on Si substrates,
- III) GaAlAs/InGaAs based PM-HEMTs and sensors.
- IV) SiC films on Si substrates.

Dr. Zekentes was the person who took the initiative to launch a SiC-related research effort in MRG.

1989.1990      *Military service/Part-time research at MRG-IESL-FORTH.*

1989      *Ph.D. Physics of Semiconductors, University of Montpellier-France;*

Dissertation: “Study of weak localization and electrons interactions in two dimensional electron gas under hydrostatic pressure”; Advisor: Professor J. L. Robert

1984-1989 *Graduate Researcher*, University of Montpellier, Groupe d'Etudes des Semiconducteurs. Research on transport properties of two-dimensional electronic systems at low temperatures, low magnetic fields and under hydrostatic pressure.

## TEACHING EXPERIENCE

He taught various courses in the *Technical Institute of Heraklion* (Adjunct Associate Professor 1991-1992), in the *Department of Physics - Univ. of Crete* (Adjunct Associate Professor 1999-2000 and at the Summer School of Advanced Physics since 1992), in the *Ecole Nationale Supérieure de Physique de Marseille* (1999) and in the *Université François Rabelais de Tours* (2001).

Dr. Zekentes was/is the responsible person for more than 25 Bachelor, 8 Master and 3 Philosophical Degree dissertation supervisions as well as 3 post-doctoral collaborations.

## PROFESSIONAL ACTIVITIES

He is reviewer in various scientific journals. He was member in many *Scientific program /organization committees* of international conferences and he gave more than 10 invited seminars in Universities/Research Centers worldwide.

Member of Program Committee of European Conference on Silicon Carbide & Related Materials (ECSCRM) and International Conference on Silicon Carbide & Related Materials (ICSCRM).

Member of Steering Committee of European Conference on Silicon Carbide & Related Materials (ECSCRM).

Chairman of the WOCSDICE 2014 and Co-Chairman of EXMATEC 2014. Co-organizer of the Spring E-MRS Symposium L “*Wide bandgap materials for electron devices*”. Co-Chairman of ECSCRM 2016 held in Halkidiki, Greece.

## RESEARCH GRANTS

Dr. Zekentes was the principal investigator and the responsible person for the development of the grant concerning FORTH's contribution of more than 20 projects with a total budget of more than 1.5 MEuros.

## SKILLS

*Molecular Beam Epitaxy*: 20 years experience with this semiconductors' epitaxy method and UHV technology. Growth of III-V compounds, Si, SiGe and SiC. Full support (operation, troubleshooting, modification) of the MBE equipment. Responsible for the development of new parts (gas feed system, addition of new pumping systems, RHEED oscillations setup). Extensive use and analysis of Auger Electron Spectroscopy and RHEED method. Basic growth mechanisms studies.

*Electron devices*: “Hands-on experience” on unipolar FET-based transistors (FETs, HEMTs, PMHEMTs), on Schottky and pn diodes as well as in avalanche-effect-based diodes. Physical analysis of DC/pulse characteristics, space charge models.

*Device fabrication*: He is involved in the development of state-of-the-art semiconductor device

processing procedures like formation of ohmic and Schottky contacts and reactive ion etching.

*Semiconductors physical characterization:*

Large experience in analysis of physical characterization results (Hall effect, DLTS, photoluminescence, C-V and electrochemical C-V measurements, different electron microscopy and XRD techniques). Developed fully computerized experimental setup for measuring transport properties in low temperatures and under magnetic fields.

*Research projects:*

Conceptualization of innovative research projects; successful fund solicitation; effective management and grant administration. More than 100 technical and progress research reports to sponsoring agencies written.