

Surname: Pintilie

First Name: Ioana

Date of Birth: 20.02.1965

Function: Senior Researcher I

Academic degree: Dr



Studies:

Diploma in Condensed Matter Physics: Faculty of Physics, University of Bucharest, 1989

Ph.D. in Physics: Faculty of Physics, University of Bucharest, 1996

Professional background:

1986-present: Continuous employment at National Institute for Materials Physics (NIMP), Bucharest, Romania (during the work stages abroad > 3 months the employment contract in NIMP was suspended)

1986-1991 *Technician in NIMP - "Pyroelectric Materials" Department*

1991-1993 *Assistant researcher in NIMP - "Pyroelectric Materials" Department*

1993-1996 appointed *Researcher CS in NIMP - "Photoconductive Thin Films" Department*

1996 appointed *Senior researcher CS III in NIMP - same Department*

1999 *2 months DAAD grant in Hamburg University, Institute for Experimental Physics*

2000 –2001 *9 months as guest scientist in Institute of Crystal Growth, Berlin*

2001 appointed *Senior researcher CS II in NIMP, Department: "Semiconductor Physics and Complex Heterostructures"*

2001-2002 *15 months guest stays as visiting scientist in Universität Hamburg, IEP,*

2003 *12 months as Research Associate in Hamburg University, IEP,*

2004 appointed: *Head of the Department: "Semiconductor Physics and Complex Heterostructures" of the National Institute for Materials Physics (NIMP), Bucharest*

2005 appointed: *Senior researcher CS I in NIMP, Department: "Semiconductor Physics and Complex Heterostructures"*

2005 *5 months guest stay as visiting scientist in Oslo University, Center for Materials Science and Nanotechnology*

2006-2008: *16 months Humboldt Fellowship in Hamburg University, (IEP)*

2010-present: Head of the "Heterostructures" Group in NIMP

Main results:

The research work has so far focused on the following directions:

A) **UV, Vis and IR detection, material research and development with focus on $A^{IV}B^{VI}$ semiconductors, Ferroelectric thin films and heterostructures.** Awards, (1) 2000: *Romanian Academy Award for Physics-Dragomir Hurmuzescu*, for serial publications in 1998 regarding Photoelectrical properties of ferroelectric-photoconductor heterostructures; (2) 2000: *Award for Excellence in Research and Innovation* – from the Romanian Ministry of Research and Education; Romanian patents: 1). *Detector for near IR modulated light*, Patent nr.110740 B1/28.03.1996 2). *PbS photoresistor controlled by field effect*, Patent nr. 112391 B1/ 29.08.1997.

Homologations of industry implemented products (1986-1989): 1) Pyroelectric material wafers from PZT with different compositions; 2) Pyroelectric detectors from PZT; 3) Linear arrays of pyroelectric detectors; 4) Device for determination of lasers energy profile; 5) Electro-thermal-dermal matrices; 6) Pyrometers.

B) Investigation of electrically active defects, development of methods for defect characterization in bulk materials and complex structures: (i) *Development of Optical Charging Spectroscopy (OCS)* as a new tool for trap investigation in bulk materials and p-n junctions. (ii) *Refinement of the Thermally Stimulated Current (TSC) method formalism for p-n junctions with high concentration of traps.* It has been demonstrated that most of the uncertainties, by which the TSC method had been regarded to be a weak tool for trapping investigation, can be eliminated and thus the extraction of absolute defect concentrations becomes possible for the first time. (iii) *Defects induced by irradiation in silicon.* It was shown for the first time that the changes in the Si device performance after exposing to high levels of irradiation can be well understood by the microscopically investigated formation of defects. (iv) *Defects in 4H-SiC epitaxial layers, correlation with growth parameters.* A direct link between the formation of the most prominent defects as $Z_{1,2}$ and $EH_{6,7}$ and the N doping, C/Si ratio and the total pressure in the growth chamber had been proven. (v) *Interface defects in MOS like structures based on linear (SiO_2 , high- k dielectrics) and non-linear oxides (ferroelectrics) and different types of semiconductors (Si, SiC, ZnO) – direct correlation of microscopically characterized defects with the electrical characteristics of the devices.*

On these topics were published more than 90 papers that generated so far more than 1000 citations. In terms of scientific management: 5 national contracts as director of the projects and 5 international contracts as NIMP responsible.