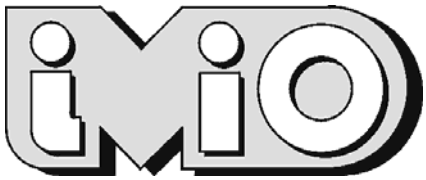
INSTITUTE OF MICROELECTRONICS AND OPTOELECTRONICS



ANNUAL REPORT

2009

Edited by Agnieszka Mossakowska-Wyszyńska

Institute Offices:

Research Affairs
Building of Radio Engineering – GR room 239
ul. Koszykowa 75, 00-662 Warsaw, Poland
phone/fax +48 22 628 87 40, phone: +48 22 234 7777

Teaching Affairs
Building of Electronics – GE room 159
ul. Nowowiejska 15/19, 00-665 Warsaw, Poland
phone/fax: +48 22 825 30 55, phone: +48 22 234 5349

Internet Information
http://www.imio.pw.edu.pl

From the Director

This Annual Report summarizes the research activities of the Institute in 2009, as well as the teaching activities in the academic year 2008/2009. The activities of the Institute in the field of electronics and computer engineering are concentrated in the area of broadly defined microelectronics, optoelectronics and photonics. These include VLSI systems, microelectronic and nanoelectronic semiconductor devices, hybrid circuits (e.g. microwave, optoelectronic), sensors, microsystems, laser optoelectronics, electronic imaging and image processing. It is worth to emphasize that research activities of the Institute span modelling, CAD, manufacturing and diagnostics.

The Institute of Microelectronics & Optoelectronics (IMiO) was founded in 1970. It evolved from the Chair of Radio Engineering established by Professor Janusz Groszkowski in 1929. Our Institute is linked with the beginnings of the Faculty of Electronics and Information Technology through the person of Prof. Groszkowski, who worked in IMiO until his death, as well as the territory – half of the Institute is situated in the Building of Radio Engineering on the Warsaw University of Technology campus. Here the Institute's Technology Centre is located. It includes laboratories of silicon processing (clean-room), hybrid technologies and assembly techniques, fibre optic and integrated optoelectronic device fabrication, laser optoelectronics, characterization of new electronic and photonic materials and manufacturing processes. These laboratories developed their activities based on research projects financed by Polish government as well as those within 6th and 7th UE Framework Programme. In 2009 the institute acquired substantial financial means for state-of-the-art research equipment through Operational Programme Innovative Economy. As a result a cluster of 5 laboratories offering high quality scientific services in the field of advanced electronic and photonic technologies will be established in IMiO.

In the field of teaching (three-level structure – B.Sc., M.Sc. and Ph.D. studies) the Institute continued to improve its contribution in the Electronics and Computer Engineering area (led together with the Institute of Electronic Systems) for on-campus studies. The involvement of the Institute in distance learning studies of Electronics and Telecommunications is also worth mentioning, especially post-diploma studies in the domain of tools and techniques of virtual education that began in 2004. At the request of the Faculty of Management IMiO developed a teaching program for students that will in the future manage production of electronic equipment. IMiO inspired and was actively involved in the organization of a series of popular-science lectures aimed to encourage secondary-school students to continue their education at our Faculty. The Institute aims for its teaching activities to meet the challenge of the development of modern technology and information society.

I express my sincere appreciation to all colleagues for your achievements which determined the position of our Institute in the Faculty of Electronics and Information Technology. Thank you very much for your cooperation in the creative development of the Institute.

Warsaw, January 2010

Professor Paweł Szczepański, Prof., Ph.D., D.Sc.

CONTENTS:

1. GENERAL INFORMATION

1.1. Organisation of the Institute and Areas of its Activities

The Institute of Microelectronics and Optoelectronics is a part of the Faculty of Electronics and Information Technology - the largest Faculty of the Warsaw University of Technology.

Our Institute consists of five divisions:

- Microelectronics and Nanoelectronics Devices Division;
- VLSI Engineering and Design Automation Division;
- Image and Microwave Photonics Division;
- Microsystem and Electronic Material Technology Division;
- Optoelectronics Division.

During the past thirty-three years of research in the area of microelectronics and optoelectronics the Institute has built its competence in:

- modelling of physical effects in modern semiconductor devices;
- silicon processing and its modelling, non-standard dielectric layer deposition techniques;
- developing methods and measurement systems to characterize electronic materials and devices;
- generation of microwaves, microwave measurement techniques, and numerical methods for electromagnetism;
- processing, designing, optimisation techniques and development of VLSI (very large scale integration of circuits) computer-aided tools;
- design and technology of thick-film hybrid circuits, fabrication of thick-film microsystems;
- modelling and design of sensors and optical-waveguide microsystems;
- laser physics (Fabry-Perot and distributed feedback lasers), laser spectroscopy of solid state active materials, and applications of lasers in medicine, manufacturing and telecommunications;
- fabrication and characterisation of optoelectronics elements and devices including fibre sensors, photovoltaics;
- silicon carbide processing for high-temperature, high-power and high-frequency electronics
- computer-aided design of photo electronic image devices, image processing and visualisation of results of experiments with image devices;
- vacuum science and technology - computer-aided design of vacuum systems, modelling of the gas flow in vacuum systems, studies of gas parameter distribution in calibration chambers (vacuum metrology).

The research activities are supported by projects financed by the State Committee for Scientific Research and those within 6th and 7th UE Framework Programme, NEMO, IDESA, NANOSIL.

The results of our scientific activities were published in many papers submitted to prestigious international scientific journals and presented at national and mostly at international conferences in the form of communications as well as the invited lectures.

1.2. Board of Directors

Director of the Institute
Paweł Szczepański, Ph.D., D.Sc. Tenured Professor
GR, room 239,
phone: +48 222347533
+48 226296799
phone/fax: +48 226288740
e-mail: p.szczepanski@elka.pw.edu.pl

Deputy-Director for Research Affairs
Ryszard Piramidowicz, Ph.D., Assistant Professor
GR, room 240,
phone: +48 226257395
+48 222347888
phone/fax: +48 226288740
e-mail: r.piramidowicz@elka.pw.edu.pl

Deputy-Director for Teaching Affairs
Lidia Łukasiak, Ph.D., D.Sc. Professor
GE, room 159,
phone: +48 222345349
+48 222347147
phone/fax: +48 228253055
e-mail:l.lukasiak@imio.pw.edu.pl

GR-Building of Radio Engineering - ul. Koszykowa 75
GE-Building of Electronics - ul. Nowowiejska 15/19

1.3. Microelectronics and Nanoelectronics Devices Division

Head of the Division

Romuald B. Beck, Ph.D., D.Sc. Tenured Professor
GR, room 336,
phone: +48 222347534,
+48 226257329
e-mail: r.beck@imio.pw.edu.pl

Senior academic staff

Andrzej Jakubowski, Ph.D., D.Sc.	Tenured Professor
Bogdan Majkusiak, Ph.D., D.Sc.	Tenured Professor
Lidia Łukasiak, Ph.D., D.Sc.	Professor
Robert Mroczyński	Assistant Professor
Zbigniew Pióro, Ph.D.	Assistant Professor
Sławomir Szostak, Ph.D.	Assistant Professor
Jakub Walczak, Ph.D.	Assistant Professor
Agnieszka Zaręba, M.Sc.	Assistant Professor
Jan Gibki, Ph.D.	Senior Lecturer
Józef Maciak, M.Sc.	Senior Lecturer
Antoni Siennicki, Ph.D.	Senior Lecturer

Junior academic staff

Grzegorz Głuszko, M.Sc.	Assistant
Jarosław Grabowski, M.Sc.	Ph.D. Student
Marcin Iwanowicz, M.Sc.	Ph.D. Student
Jakub Jasiński, M.Sc.	Ph.D. Student, Assistant
Arkadiusz Malinowski, M.Sc.	Ph.D. Student
Andrzej Mazurak, M.Sc.	Ph.D. Student
Piotr Pływaczewski, M.Sc.	Ph.D. Student
Michał Rakowski, M.Sc.	Ph.D. Student
Paweł Sałek, M.Sc.	Ph.D. Student
Anna Sawicka, M.Sc.	Ph.D. Student
Jędrzej Stęszewski, M.Sc.	Ph.D. Student

Technical and administrative staff

Witold Ciemiewski,
Kazimierz Dalbiak,
Krzysztof Krogulski,

The research carried out in the Microelectronics and Nanoelectronics Devices Division falls into three main areas, namely: technology, diagnostics and modelling of semiconductor structures, as well as applications of microelectronics in digital signal processing.

To name a few examples of its research topics:

- Modelling and investigation on kinetics of silicon oxidation (particularly of the beginning stages of the process);
- Diagnostics and characterisation of properties of single and double insulating layers (gate stack including ultra thin oxide layers) by means of electrical measurements analysis;
- Wear-out and degradation processes in MOS structures (breakdown of dielectrics layers, hot carriers effects, radiation damage effects);
- Transport mechanism and quantum effects in MOS structures (transistor, tunnel diode) with ultra thin oxide;
- New materials (semiconductors and dielectrics) for microelectronics applications (e.g.: silicon carbide, gallium nitride, silicon-germanium, germanium)
- Theoretical studies on MOS-SOI (silicon-on-insulator) and Si:Ge (silicon-germanium) MOS structure physics (modelling of devices behaviour and modelling for characterisation and diagnostics);
- Nanoelectronic phenomena and devices (e.g. tunnel and resonance tunnel diodes and transistors, Coulomb blockade diode, single-electron transistors, memories);
- PECVD deposition of ultra thin dielectric layers for MOSFET gate dielectric (SiO_2, Si_3N_4, SiO_xN_y);
- Ultra shallow implantation from r.f. plasma;
- Very low temperature processing of test structure;
- Fabrication of ultrathin amorphous silicon layers by PECVD
- Fabrication of double barrier structures and devices;
- MEMS/MOEMS processing.

1.4. VLSI Engineering and Design Automation Division

Head of the Division

Wiesław Kuźmicz, Ph.D., D.Sc. Tenured Professor
GE, room 355,
phone: +48 222347207
e-mail:wbk@imio.pw.edu.pl

Senior academic staff

Andrzej Pfitzner, Ph.D., D.Sc.	Professor
Elżbieta Piwowarska, Ph.D.	Docent
Grzegorz Janczyk, Ph.D.	Assistant Professor
Zbigniew Jaworski, Ph.D.	Assistant Professor
Dominik Kasprowicz, Ph.D.	Assistant Professor
Marek Niewiński, Ph.D.	Assistant Professor
Witold Pleskacz, Ph.D.	Assistant Professor
Andrzej Wielgus, Ph.D.	Assistant Professor
Adam Wojtasik, Ph.D.	Assistant Professor

Junior academic staff

Tomasz Borejko, M.Sc.	Ph.D. Student
Michał Bryk, M.Sc.	Ph.D. Student
Jacek Grądzki, M.Sc.	Ph.D. Student
Arkadiusz Łuczyk, M.Sc.	Ph.D. Student, Assistant
Krzysztof Marcinek, M.Sc.	Ph.D. Student
Grzegorz Wąchała, M.Sc.	Ph.D. Student

Technical and administrative staff

Jerzy Gempel, M.Sc.
Stanisław Jeszka, M.Sc.

The research carried out in the division falls into several main areas: development of IC design methodologies and tools, design of digital and analog integrated circuits for nonstandard demanding applications and application of microelectronics in signal processing.

Current research projects in the Division include:

- methodologies of integrated circuit design for manufacturability: application of statistical process and device simulation in IC design, investigations of spatial on-chip correlation of random process disturbances, analysis of layout sensitivity to spot defects;

- design of analogue VLSI circuits: analogue implementations of fuzzy logic controllers for biomedical applications, methodologies of testing and design for testability of analogue VLSI integrated circuits;
- development of CAD tools for integrated circuit design and verification, with special emphasis on analogue full custom ASICs design;
- investigations of signal propagation and crosstalk in long interconnections in deep submicron VLSI circuits;
- design of digital and mixed VLSI circuits for special applications: CNN, data processing in physical experiments, etc.;
- modeling and control of leakage currents in nanometer CMOS digital circuits.

1.5. Image and Microwave Photonics Division

Head of the Division

Jerzy Woźnicki, Ph.D., D.Sc. Tenured Professor
GE, room 156,
phone: +48 222347784,
+48 228257361
e-mail: J.Woznicki@imio.pw.edu.pl

Senior academic staff

Bogdan Galwas, Ph.D., D.Sc.	Tenured Professor
Janusz Parka, Ph.D., D.Sc.	Professor
Jarosław Dawidczyk, Ph.D.	Assistant Professor
Piotr Garbat, Ph.D.	Assistant Professor
Jerzy Piotrowski, Ph.D.	Assistant Professor
Marek Sutkowski, Ph.D.	Assistant Professor
Agnieszka Szymańska, Ph.D.	Assistant Professor
Piotr Witoński, Ph.D.	Assistant Professor
Jerzy Skulski, M.Sc.	Senior Lecturer

Junior academic staff

Krzysztof Madziar, M.Sc.	Ph.D. Student, Assistant
Daniel Paluch, M.Sc.	Ph.D. Student, Assistant

Technical and administrative staff

Jerzy Domański, M.Sc.
Bożena Janus

The main areas of activity of the Division are education and research, both in the field of the technology of electronic imaging devices, digital image processing, propagative electronics and microwave photonics. Members of the academic staff are involved in research and development works on:

- theoretical principles of image modelling, processing and analysis;
- application of image processing methods for diagnostic control and measurement systems in industry, medicine, research and commerce;
- image acquisition in polarization imaging systems and optical image processing;
- 3D Vision methods and algorithms;
- electro optic effects in liquid crystals and their applications to LCD and photo refractive phenomena in liquid crystals;
- an analysis of the oscillation conditions, frequency stabilisation and synthesis in microwave bands;
- measurement techniques of microwave circuits and devices parameters with emphasis on automation and computerisation of measurement methods;
- modelling and computer aided design of microwave devices and circuits;
- controlling of microwave circuits parameters by means of optical signals;
- investigations and modelling of optical-microwave frequency conversion processes;
- modelling of optically controlled microwave devices, as photodiodes, photo-varactors, phototransistors;
- modelling of optoelectronic and microwave devices for data transmission networks.

1.6. Electronic Materials and Microsystem Technology Division

Head of the Division

Jan Szmidt, Ph.D., D.Sc. Tenured Professor
GE, room, 115,
GR; room, 338; 424
phone: +48 222347599,
+48 222347497,
+48 226257329
+48 222347776
e-mail: J.Szmidt@imio.pw.edu.pl

Senior academic staff

Jerzy Krupka, Ph.D., D.Sc.	Tenured Professor
Mikołaj Baszun, Ph.D.	Assistant Professor
Michał Borecki, Ph.D.	Assistant Professor
Jerzy Kalenik, Ph.D.	Assistant Professor
Ryszard Kisiel, Ph.D.	Assistant Professor
Zdzisław Mączeński, Ph.D.	Assistant Profesor
Stanisław Pietruszko, Ph.D.	Assistant Profesor
Mateusz Śmietana, Ph.D.	Assistant Professor
Aleksander Werbowy, Ph.D.	Assistant Professor

Junior academic staff

Piotr Caban, M.Sc.	Ph.D. Student
Łukasz Chudzian, M.Sc.	Ph.D. Student
Piotr Firek, M.Sc.	Ph.D. Student, Assistant
Ryszard Gronau, M.Sc.	Ph.D. Student
Konrad Kiełbasiński, M.Sc.	Ph.D. Student
Krzysztof Kłos, M.Sc.	Ph.D. Student
Piotr Knyps, M.Sc.	Ph.D. Student
Krystian Król, M.Sc.	Ph.D. Student
Norbert Kwietniewski, M.Sc.	Ph.D. Student
Mateusz Mroczkowski, M.Sc.	Ph.D. Student
Andrzej Stefański, M.Sc.	Ph.D. Student

Science research staff

Małgorzata Kalisz, Ph.D
Mariusz Sochacki, Ph.D.

GR-Building of Radio Engineering - ul. Koszykowa 75
GE-Building of Electronics - ul. Nowowiejska 15/19

Technical and administrative staff
Ryszard Biaduń.

The research activity of the Division concentrates on optoelectronic and hybrid devices. Fundamental and applied research are carried out. Research groups are organised for defined tasks.

The main research areas are as follows:

- fabrication and investigation of the following optoelectronic devices: integrated passive and active light wave guiding structures (modulators, bistable switches etc.) and fibre optic sensors;
- computer engineering for fibre optics;
- new techniques of surface mounted devices on PCB (printed circuit boards);
- application of thin and thick film technology in hybrid devices and thick film sensors fabrication;
- investigation of the electronic structure, stability and optical properties of amorphous silicon and its devices (thin film transistors, solar cells, etc.);
- research, design and monitoring of photovoltaic systems, strategy for development of photovoltaic solar energy;
- electronic packaging technology;
- plasma deposition of nanocrystalline diamond (NCD), diamond-like carbon (DLC) thin films and their application in fibre optic and waveguide sensing structures.

1.7. Optoelectronics Division

Head of the Division
Michał Malinowski, Ph.D., D.Sc. Tenured Professor
GR, room 123,
phone: +48222347783
e-mail:M.Malinowski@elka.pw.edu.pl

Senior academic staff

Paweł Szczepański, Ph.D., D.Sc.	Tenured Professor
Marcin Kaczkan, Ph.D.	Assistant Professor
Jerzy Kęsik, Ph.D.	Assistant Professor
Agnieszka Mossakowska-Wyszyńska, Ph.D.	Assistant Professor
Ryszard Piramidowicz, Ph.D.	Assistant Professor
Anna Tyszka-Zawadzka, Ph.D.	Assistant Professor
Piotr Warda, Ph.D.	Assistant Professor

Junior academic staff

Krzysztof Anders, M.Sc.	Ph.D. Student
Paweł Gdula, M.Sc.	Ph.D. Student
Anna Jusza, M.Sc.	Ph.D. Student
Mariusz Klimczak, M.Sc.	Ph.D. Student
Marcin Koba, M.Sc.	Ph.D. Student
Kamila Leśniewska-Matys, M.Sc.	Ph.D. Student
Katarzyna Ławniczuk, M.Sc.	Ph.D. Student
Adam Rudziński, M.Sc.	Ph.D. Student
Stanisław Stopiński, M.Sc.	Ph.D. Student

Technical and administrative staff
Wojciech Kamiński, Ph.D.

The activity of the Optoelectronics Division is concentrated on education as well as on various areas of optoelectronic research in the field of laser physics, laser spectroscopy, laser construction and laser applications in medicine and air pollution monitoring.

The academic staff of the Division gives lectures in photonics, laser physics, laser technology, laser applications, laser spectroscopy, integrated optoelectronics and optical computing, all of which are accompanied by appropriate laboratory class activities.

The main research activity of the Division comprises:

- solid state laser construction and their applications in materials processing;
- spectroscopic research of new laser materials, investigation of the excitation processes in rare earth doped dielectric materials, research of blue up-conversion laser structures, waveguide lasers;
- theoretical research of laser generation in planar, fibre and hollow waveguide gas lasers, analysis of light generation in DFB (distributed feedback) structures, photonic crystals structures and in lasers with non-linear optical elements, investigation of the statistical properties of the light generated in various laser structures;
- nano-optical structures and photonic band-gap materials;
- research of light generation in metal vapour gas lasers, measurement of laser parameters, investigation of light generation in hollow cathode lasers, analysis of plasma discharge processes, research of the opto-galvanic effect;
- optimisation of the construction of ion gas lasers, investigation of the processes in discharge tube ceramic ion laser and laser operation in various cavity geometry, investigation of light generation in ion gas lasers for medical applications.

1.8 Statistical Data

SPECIFICATION	2008	2009	DIFFERENCE
Academic staff	79	88	+9
Tenured professors	8	10	+2
Professors	5	3	-2
Docent	1	1	0
Assistant professors	31	31	0
Senior lecturers	4	4	0
Assistants and Ph.D. students	30	39	+9
Science research staff	2	3	+1
Technical staff	10	11	+1
Administrative staff	5	9	+4
Computers	308	317	+9
Library resources - Books (number of volumes)	3473	3532	+59
Teaching activities	57	73	+16
Basic courses	35	38	+3
Advanced courses	17	19	+2
Special courses	5	16	+11
Research projects	34	35	+1
Granted by the University	9	6	-3
Granted by State Institutions	20	22	+2
Granted by International Institutions	5	7	+2
Degrees awarded	78	61	-17
Ph.D. degrees	4	2	-2
M.Sc. degrees	40	38	-2
B.Sc. degrees	34	21	-13
Publications	129	125	-4
Sci.-tech. books	9	9	0
Sci.-tech. papers in journals	75	41	-34
Sci.-tech. papers in conference proceedings	45	75	+30
Patents	3	4	+1
Reports	27	25	-2
Conferences	32	29	-3
Awards	15	11	-4

2. STAFF

2.1 Senior Academic Staff

Mikołaj Baszun, M.Sc. ('69), Ph.D. ('77), Computer engineering, Assistant Professor, full time, Electronic Materials and Microsystem Technology Division, WUT Rector's Award ('06), President's of the Republic of Poland Gold Medal for Long-Term Service ('08)

room # 363 GE
phone: +48 222347906
e-mail: mbaszun@elka.pw.edu.pl

Romuald B. Beck, M.Sc. ('76), Ph.D. ('82), D.Sc. ('96), Microelectronics, Electronics, Professor, full time, Head of Microelectronics and Nanoelectronics Devices Division ('04), Leader of the Technology, Diagnostics and Modelling Group ('85-), Vice President of the Microelectronics Section of the Electronics and Telecommunication Committee of the Polish Academy of Sciences ('93-), Member od Programme Committee of: Diagnostics & Yield Conference ('88-), Co-chairman ('03-), Chairman ('06); Member of Programme Committee of ELTE ('84, '04, '07), Member of Technical Programme Committee ESSDERC ('05-), Senior Member of IEEE ('97-), Member of Electrochemical Society ('98-), Head of CEZAMAT Project Office ('08), WUT Rector's Collective Award for Scientific Achievements ('08).

room # 337 GR
phone: +48 226257329,
+48 222347534
fax: +48 226257329
e-mail: r.beck@imio.pw.edu.pl

Michał Borecki, M.Sc. ('91), Ph.D. (' 96), CAD, Optoelectronics, Assistant Professor, full time, Electronic Materials and Microsystem Technology Division, Member of Optoelectronics Section of the Electronics and Telecommunication Committee of the Polish Academy of Sciences ('99-), Member of Association of Polish Electrical Engineers SEP ('99-).

room # 537 GR
phone: +48 222347749
fax: +48 226288740
e-mail: borecki@imio.pw.edu.pl

Jarosław Dawidczyk, M.Sc. ('98) Ph.D. ('05) with distinction, Microwave Electronics, Optoelectronics, Assistant Professor, full time, Microwave Electronics and Photonics Division.

room # 55 GE
phone: +48 222347949
e-mail: j.dawidczyk@elka.pw.edu.pl

Bogdan Galwas, M.Sc.('62), Ph.D. ('69), D.Sc. ('76), Microelectronics, Microwave Electronics, Tenured Professor, full time, Head of Microwave Electronics and Photonics Division ('84-'09), Pro-Rector of WUT ('87-'90), Member of Electronics and Telecommunications Committee of the Polish Academy of Sciences ('88-), Member of Scientific Council of Industrial Institute of Telecommunications ('90-), Chairman of the International Management Committee of the International Travelling Summer Schools ('91-), Director of Ph.D. Studies in Electronics and Telecommunications ('92-), Senior Member of IEEE ('94-), Member of Scientific Council of Institute of Telecommunications ('97-), Member of IACEE ('97-), Member of SEFI ('97-), Rector's Plenipotentiary for New Technologies and Forms of Education ('99-), Director of WUT Center for Distance Learning – OKNO ('00-), Dean of the Faculty of Electronics and Information Technology ('05-'08), WUT Rector's Individual Award for Didactic Achievements ('08).

room # 51a GE
phone+48 222347939,
+48 228250393
fax: +48 228250393
e-mail: B.Galwas@elka.pw.edu.pl

Piotr Garbat, M.Sc.('00), Ph.D. ('05), Image and Video Processing, Techniques, Computer Vision, 3D Data Processing in Multimedia Applications. Assistant Professor, full time, Image Processing Division, Member of SPIE ('01-).

room # 149 GE
phone: +48 222347780
e-mail: pgarbat@imio.pw.edu.pl

Jan Gibki, M.Sc. ('74), Ph.D. ('97), Electronics, Automatics, Senior Lecturer, full time, Microelectronics and Nanoelectronics Devices Division, WUT Rector's Award for Didactic Achievements ('04).

room # 275 GE
phone: +48 222347535
fax: +48 226257329
e-mail: gibki@imio.pw.edu.pl

Andrzej Jakubowski, M.Sc. ('63), Ph.D. ('73), D.Sc. ('83), Electronics, Microelectronics, Full Professor, full time, Microelectronics and Nanoelectronics Devices Division ('01-), Head of the Insititute of Microelectronics and Optoelectronics ('04-'08), Head of the Institute of Electron Technology in Warsaw ('89-'92), Chairman of the Section of Applied Research of Science and Technical Progress Government Committee ('90-'91), Head of Microelectronics Division ('84-'01), Member of Faculty Council ('77-), Member and Vice-Chairman of the Electronics and Telecommunications Committee of the Polish Academy of Sciences, Head of its Microelectronics Section ('88-03), Pożaryski Award for Scientific Publications ('86, '96), Member of Programme Committee of ELTE ('84-), MiEL ('94-), IWSPD ('96-), MIXDES ('97-), IEEE ICCDS ('02-), Chairman of "Diagnostic and Yield" ('88-), Editor-in-chief of "Electron Technology" ('90-'94), WUT Rector's Collective Award for Scientific Achievements ('08).

room # 336 GR
phone: +48 222347534,
fax: +48 226257329
e-mail:
a.jakubowski@imio.pw.edu.pl

Grzegorz Janczyk: M.Sc. (’99) with honors, Ph.D. (’05), VLSI Engineering and Automation Division, Assistant Professor, full time, IEEE member (’00-).

room # 353 GE
phone: +48 222347207
fax: +48 228258203
e-mail: janczyk@imio.pw.edu.pl

Zbigniew Jaworski, M.Sc. (’90), Ph.D. (’97), Microelectronics, Assistant Professor, full time, VLSI Engineering and Design Automation Division.

room # 354 GE
phone: +48 222347207
fax: +48 228258203
e-mail: jaworski@imio.pw.edu.pl.

Marcin Kaczkan, M.Sc. ('98), Ph.D. ('04), Optoelectronic, Laser technology, Spectroscopy of solid state laser materials, Assistant Professor, full time, Optoelectronics Division, Adam Smoliński Award of Polish Committee for Optoelectronics of Association of Polish Electrical Engineers SEP for his master thesis ('98).

room # 128a GR
phone: +48 222345047
fax: +48 226288740
e-mail: mkaczkan@elka.pw.edu.pl

Jerzy Kalenik, M.Sc. ('79), Ph.D. ('89), Electron Technology, Assistant Professor, full time, Electronic Materials and Microsystem Technology Division, Member of IMAPS Poland Chapter ('84-), Dean's Plenipotentiary for Students Industrial Training ('91-), WUT Rector’s Collective Award for Organizing Achievements (’08).

room #423a GR
phone: +48 222347779
fax: +48 226288740
e-mail: kalenik@imio.pw.edu.pl

Dominik Kasprowicz: M.Sc. ('01), Ph.D. with honors ('06), Microelectronics, Assistant Professor (’07), full time, VLSI Engineering and Automation Division, WUT Rector’s Award for Scientific Achievements (’07).

room # 357 GE
phone: +48 222347207
fax: +48 228258203
e-mail: dkasprow@imio.pw.edu.pl

Jerzy Kęsik, M.Sc. ('67), Ph.D. ('77), Optoelectronic, Laser technology, Assistant Professor, full time, Optoelectronics Division, Prime Minister Award for remarkable technical and science national achievement (‘00).

room # 125a GR
phone: +48 222347145
fax: +48 226288740
e-mail: kesik@imio.pw.edu.pl

Ryszard Kisiel, M.Sc. ('74), Ph.D. ('83), Electron Technology, Assistant Professor, full time, Electronic Materials and Microsystem Technology Division, Member of IMAPS Poland Chapter ('87-), Member of Editorial Board of "Elektronika" ('94-‘05), Vice President of IMAPS Poland (‘99-‘01), Member of Scientific Committee of IMAPS-Poland Chapter (‘00-), Member of IEEE CPMT Society (‘00-), Member of the Electron Technology and Electronic Materials Section of The Polish Academy of Sciences (‘07-), WUT Rector’s Collective Award for Organizing Achievements (’08).

room # 425 GR
phone: +48 222347852
fax: +48 226288740
e-mail: kisiel@imio.pw.edu.pl

Jerzy Krupka, M.Sc. ('73), Ph.D. ('77), D.Sc. ('89), Microwave Theory and Technique, Professor, full time, Electronic Materials and Microsystem Technology Division, Member of the Faculty Council ('89-), Member of Microwave Section of the Electronics and Telecommunication Committee of the Polish Academy of Sciences ('96-), Member of Editorial Board of IEEE Trans. Microwave Theory Tech. ('94-), Best Paper Award in Journal Measurements, Science and Technology (’99), Head of Characterization of Electronic Materials Group (‘00-‘05), Senior Member of IEEE (’01), Member of IOP Institute of Physics UK (‘01-), Golden Cross awarded by the President of Poland (’06), Prime Minister Award for Outstanding Technical Achievements (’07), Bronze Medal and Diploma from Association Of Polish Inventors And Rationalizers on International Invention & Innovation Show IWIS-2008.

room # 364 GE
phone: +48 222347693
fax: +48 228253055
e-mail: krupka@imio.pw.edu.pl

Wiesław Kuźmicz, M.Sc. ('70), Ph.D. ('74), D.Sc. ('86), Microelectronics and VLSI Design, Tenured Professor, full time, VLSI Engineering and Design Automation Division, Member of IEEE ('85-), Member of the Faculty Council ('87-), Member of the Committee for Electronics and Telecommunication of the Polish Academy of Sciences ('93-‘03), Member of the Scientific Council, Institute of Electron Technology ('95-‘03), Member of the Faculty Council Research Committee ('93-'05), Member of the Faculty Council Awards Committee ('96-'05), Head of VLSI Engineering and Design Automation Division (‘00-), Member of Societas Scientiarum Varsoviensis (‘02-).

room # 355 GE
phone: +48 222347207
+48 222347146
fax: +48 228258203
e-mail: wbk@imio.pw.edu.pl

Lidia Łukasiak, M.Sc. ('88), Ph.D. ('94), D.Sc. (’02), Microelectronics, Professor, full time, Microelectronics and Nanoelectronics Devices Division, Deputy-Director for Teaching Affairs of the Insititute of Microelectronics and Optoelectronics (‘04-), WUT Rector's Award for Scientific Achievements (‘96), Prime Minister’s Award for Distinguished Ph.D. Thesis (’95), Scientific Secretary of the Microelectronics Section of the Electronics and Telecommunication Committee of the Polish Academy of Sciences (‘96-‘03), Co-Chairman Conference “Diagnositics and Yield” (’00-), Member of Programme Comm.

room # 368 GE
phone: +48 222347147
fax: +48 228253055
e-mail: lukasiak@imio.pw.edu.pl

IEEE ICCDS (‘02-), Programm Chairman of “Diagnositics and Yield” (’03, ‘06), Deputy-Director for Teaching Affairs of the Institute of Microelectronics and Optoelectronics (’04-), Member of ESSFERC’05 and ESSDERC’06 Technical Programme Committee, co-Editor of “Electron Technology” (‘92-‘95), WUT Rector’s Collective Award for Scientific Achievements (’08).

Józef Maciak, Eng. (’68), M.Sc. (’88), Electronics, Electronics Measurements, Lecturer, full time, Microelectronics and Nanoelectronics Devices Division, WUT Rector’s Award for Didactic Achievements (’04).

room # 274 GE
phone: +48 222347775
fax: +48 226257329
e-mail: maciak@imio.pw.edu.pl

Bogdan Majkusiak, M.Sc. (‘79), Ph.D. (‘85), D.Sc. (‘91), Prof. (’03), Microelectronics, Professor, full time, Microelectronics and Nanoelectronics Devices Division, Scientific Secretary of the Microelectronics Section of the Electronics Telecommunication Committee PAN (‘89-‘96) and member (‘96-), Member of the IEEE (‘92-), Member of Faculty Council (’92-), Member of Curriculum Committee (‘93-‘99), Associate Dean for Academic Affairs (‘96-‘99), Senior Associate Dean (‘99-‘02), Member of Program Committee INFOS’(‘05, ‘07), Member of Program Committee of D&Y (‘84-), Member of Editorial Counsil of Electron Technology (‘02-), Member of Nanotechnology Conference Program Committee (’07), Expert of Acreditation Committee of Technical Universities (’01-), Expert of Poland Acreditation Committee (’03-), Member of Scientific Council of Institute of Electron Technology (‘03-‘07), WUT Rector’s Individual Award for Scientific Achievements (’08).

room # 233 GR
phone: +48 222347773;
+48 226257329
fax: +48 226257329
e-mail: majkusiak@imio.pw.edu.pl

Michał Malinowski, M.Sc. (‘79), Ph.D. (‘85), D.Sc. (‘90), Electronic, Optoelectronic, Professor, full time, Optoelectronics Division, Member of Faculty Council (‘90-), Member of Curriculum Committee I (‘94-), Member of Optoelectronics Section of the Electronics and Telecommunication Committee of the Polish Academy of Sciences (‘94-), Member of Association of Polish Electrical Engineers SEP (‘96-), Head of Optoelectronics Division (‘99-), WUT Rector’s Collective Award for Scientific Achievements (’08).

room # 123 GR
phone: +48 222347783
fax: +48 222347783; +48 226218740
e-mail:
M.Malinowski@elka.pw.edu.pl

Zdzisław Mączeński, M.Sc. ('66), Ph.D. ('75), Magnetic Measurement and Instrumentation, Senior Lecturer, full time, Electronic Materials and Microsystem Technology Division, Member of the Faculty Council ('81-), Associate Dean for Faculty Students Affairs ('96-), Medal of National Education Commission (’08).

room # 367, 112 GE
phone: +48 222347901,
+48 228253758
fax: +48 228251984
e-mail: maczenski@elka.pw.edu.pl.

Agnieszka Mossakowska-Wyszyńska, M.Sc. ('91), Ph.D. ('96) with distinction, Optoelectronics, Quantum Electronics, Assistant Professor, full time, Optoelectronics Division, Grant from Foundation of Polish Science (’95), Secretary of Optoelectronics Section of the Electronics and Telecommunication Committee of the Polish Academy of Sciences ('96-), Member of Association of Polish Electrical Engineers SEP ('96-), Prime Minister Award for dissertation thesis (’97), Editor of Annual Report of Institute of Microelectronics and Optoelectronics (‘00-), Member of the Faculty Council ('05-), Member of the Dean's Commission for Faculty Organization (’08-), Member of Photonics Society of Poland (’08-).

room # 120 GR
phone: +48 222345982
fax: +48 226288740
e-mail: amossako@elka.pw.edu.pl

Robert Mroczyński, M.Sc. ('03), Ph.D. ('08), Microelectronics, Electronics, Assistant Professor, full time, Microelectronics and Nanoelectronics Devices Division, distinction for scientific reports at Conference: ELTE '04, ELTE '07 and D&Y '06, Member of Organizing Committee of Diagnostics & Yield Symposium('06, '09), Scholarship of Advanced Studies Centre of Warsaw University of Technology ('08-), Member of Electrochemical Society (’09-).

room # 232b GR
phone: +48 226257534
fax: +48 226288740
e-mail: rmroczyn@elka.pw.edu.pl

Marek Niewiński, M.Sc. (’91), Ph.D. ('06), Vacuum Science and Technology, full time Assistant Professor, VLSI Engineering and Design Automation Division.

room # 538 GR
phone: +48 222345478
fax: +48 226288740
e-mail: niewinski@imio.pw.edu.pl

Janusz Parka, M. Sc (‘77), Ph.D. (’84), D.Sc. (’01), Material Science, Engineering of Liquid Crystals, Professor, half time, Image Procession Division, Member of International Society for Optical Engineering, Polish Chapter, Member of International Board of Optics of Liquid Crystals (’03-‘08).

room #157 GE
phone: +48 228257361,
+48 222347780
fax: +48 222345419
e.mail: J.Parka@imio.pw.edu.pl

Andrzej Pfitzner, M.Sc. (‘74), Ph.D. (‘78), D.Sc. ('99), Microelectronics, Professor, full time, VLSI Engineering and Design Automation Division, Member of the Faculty Council (’81-‘85 i 90-), Deputy-Director for Teaching Affairs of the Institute of Microelectronics and Optoelectronics (‘91-'99), Director of the Institute of Microelectronics and Optoelectronics (’99-’04), Member of the Dean's Financials Commission ('93-‘99), Member of the „MIXDES” International Programme Committee (‘94-) (Mixed Design of Integrated Circuits and Systems), Member of the Programme Committee of the Conference "Electron Technology” (‘99-), Member of the Microelectronics Section of the Committee for Electronics and Telecommunication of the Polish Academy of Sciences ('99-), Member of the Senat Financials Commission (‘02-‘05), Chairman of the Faculty Council Educations Commission (‘05-‘08), Faculty Plenipotentiary of Education Quality and member of the University Coucil for Education Quality (’07-).

room # 360 GE
phone: +48 222347207
fax: +48 228258203
e-mail: apf@imio.pw.edu.pl

Stanisław M.Pietruszko, M.Sc.('71), Ph.D. ('81), Microelectronics and Semiconductors; Photovoltanics, Assistant Professor, full time, Electronic Materials and Microsystem Technology Division, Member of American Physics Society ('87-), Member of Materials Research Society USA ('87-), Member of International Solar Energy Society ('88-), Senior Associate of the International Centre for Theoretical Physics ('91-), Member of International Association for Solar Energy Education ('92-), Member of Program Committee of the World Renewable Energy Conference ('92-), Founder Member of World Renewable Energy Network ('92-), Member of International Advisory Board of the ENERGEX ('95-); Candidates Nominator for Japan Price ('95-), Member of the Managing Board of the Polish Solar Energy Society ('99-), Silver Member of International Solar Energy Society (ISES), Expert European Commission (5, 6 i 7 Framework Program RTD), Program ALTENER ('99-), Member observer of IEA PVPS Implementation Program (ExCo, Task I) ('99-), Member of Scientific Program Committee and International Advisory Board PV Solar Energy Conference ('00-), President of the Central Europe International Energy Foundation Regional Headquarters ('01-), Member of American Solar Energy Society ('05-), President of the Polish Socieety for Photovoltaics ('05-), Member of the Steering Committee of the European Photovoltaic Technology Platform ('05-), Member of the Section of the Microelectronics of the Committee for Electronics and Telecommunication of the Polish Academy of Sciences ('08-), Member of SPIE ('08-), Member of Policy Committee European Photovoltaic Association (EPIA) ('08-), Deputy Chairman of the Technical Committee of Polish Committee of Standards no 54 for Chemical Sources of Current

room # 29 GR
phone: +48 222347782
fax: +48 226288740
e-mail: pietruszko@imio.pw.edu.pl
pietruszko@pv.pl

Jerzy K.Piotrowski, M.Sc. ('75), Ph.D. ('88) with honours, Microwave and Lightwave Techniques, Assistant Professor, full time, Microwave Electronics and Photonics Division, Member of IEEE ('89-), Chairman of the IEEE AP/AES/MTT Joint Chapter (Poland Section) (’00-’02), Visiting Professor at the Technische Universität Hamburg-Harburg (’02-’04), Member of the Faculty Council ('05-).

room # 52 GE
phone: +48 222345394
fax: +48 228250393
e-mail: piotrowski@imio.pw.edu.pl

Zbigniew Pióro, M.Sc. ('71), Ph.D. ('75), Electronics, Microelectronics, Assistant Professor, full time, Microelectronics and Nanoelectronics Devices Division.

room # 362 GE
phone: +48 222347907
fax: +48 228253055
e-mail: z.pioro@imio.pw.edu.pl

Ryszard Piramidowicz, M.Sc. ('94), Ph.D. (‘00) with distinction, Optoelectronics, Assistant Professor, full time, Optoelectronics Division, Deputy-Director for Research Affairs of the Institute of Microelectronics and Optoelectronics (’08-), Member of Association of Polish Electrical Engineers SEP ('96-), Member of IEEE ('05-), Member of OSA (’06-), Member of Technical Committee no. 282 of Polish Committee for Standardization ('98-), WUT Rector’s Collective Award for Scientific Achievements ('00, ‘08).

room # 240 GR
phone: +48 222347888,
+48 226257395
fax: +48 226288740
e-mail:
R.Piramidowicz@elka.pw.edu.pl

Elżbieta Piwowarska, M.Sc. (‘83), Ph.D. (‘95) with honours, Microelectronics, Docent, full time, VLSI Engineering and Design Automation Division, Member of the Faculty Council (‘96-), WUT Rector's Award for Scientific Achievements (’89, ’96), Ministry award for Teaching Achievements (’93, ’03, ’06), Deputy-Director for Teaching Affairs of the Institute of Microelectronics and Optoelectronics ('99-‘04), Member of the Dean's Financial Commission ('99-‘04), Member of the Microelectronics Section of the Committee for Electronics and Telecommunication of the Polish Academy of Sciences ('00-), Director of University Center for Open and Distance Learning ('06-).

room # 359 GE
phone: +48 222347207
fax: +48 228258203
e-mail: piwowarska@imio.pw.edu.pl

Witold Pleskacz, M.Sc. (’83), Ph.D. (’95) with honours, Microelectronics, CAD, Assistant Professor, full time, VLSI Engineering and Design Automation Division, Two WUT Rector’s Awards for Scientific Achievements (’89, ’96), Ministry of National Education Award for Teaching Achievements (’93), Member of the Faculty Council (’99-‘02),

room # 359 GE
phone: +48 222347207
fax: +48 228258203
e-mail: pleskacz@imio.pw.edu.pl

"Golden Chalk" - Student Council of the Faculty Teaching Award (’00, ‘08), Ministry of Science and Higher Education Award for Education Achievements (’06), Member of the "CADSM" International Programme Committee (International Conference - the Experience of Designing and Application of CAD Systems in Microelectronics) (’01-), Member of the "YOT" Programme Committee (IEEE International Workshop on Yield Optimization & Test) (’01), Member of the "DFT" Programme Committee (IEEE International Symposium on Defect and Fault Tolerance in VLSI Systems) (’02-), Member of the "DDECS" Programme Committee (IEEE Workshop on Design and Diagnostics of Electronic Circuits and Systems) (’04-), Member of the "MEMSTECH" International Programme Committee (International Conference on Perspective Technologies and Methods in MEMS Design) (’05-), Member of the "DSD-SS" Programme Committee (Euromicro Conference on Digital System Design - Special Sessions) (’05), Member of the "ECS" Programme Committee (Electronic Circuits and Systems Conference) (’05-).

Antoni Siennicki, M.Sc. ('68), Ph.D. ('90), Solid State Electronics, Senior Lecturer, full time, Microelectronics and Nanoelectronics Devices Division, Member and Scientific Secretary of the Electronics and Telecomunication Committee of the Polish Academy of Sciences (‘78-’83).

room # 284 GE
phone: +48 222347535
e-mail: siennicki@imio.pw.edu.pl

Jerzy Skulski, M. Sc. (’71), Microwave Electronics, Senior Lecturer, full time, Microwave Electronics and Photonics Division.

room # 54 GE
phone: +48 222347348
fax. +48 228250393
e-mail: jskulski@elka.pw.edu.pl

Marek Sutkowski, M.Sc.('97), Ph.D. ('03), Photographic Techniques, Imaging and Video Systems, Application of LC Cells in Imaging Techniques, Holography in Multimedia Applications. Assistant Professor, full time, Image Processing Division.

room #147 GE
phone: +48 222347780
e.mail: sut@imio.pw.edu.pl

Paweł Szczepański, M.Sc. (81), Ph.D. ('88), D.Sc. ('94), Optoelectronics, Tenured Professor, full time, Optoelectronics Division, Member of Faculty Council ('94-), Member of Association of Polish Electrical Engineers SEP ('96-), Member of Optoelectronics Section of the Electronics and Telecommunication Committee of the Polish Academy of Sciences ('96-), Member of Optical Society of America ('96-), Member of IEEE ('96-), Editor of Journal of Telecommunications and Information Technology (‘98-), Member of Photonics Society of Poland (’08-), Deputy-Director for Research Affairs of the Institute of Microelectronics and Optoelectronics (’04-‘08), Head of the Institute of Microelectronics and Optoelectronics (’08-), Representative of Warsaw University of Technology in Networks of Excellence of Micro-Optics NEMO (’04), Member of European Optical Society (’06).

room # 239 GR
phone: +48 222347246,
+48 222347533,
+48 226296799
fax: +48 226288740
e-mail:
P.Szczepanski@elka.pw.edu.pl

Jan Szmidt, M.Sc. ('76), Ph.D. ('84), D.Sc. (‘95), Microelectronics, Electron Technology, Associate Professor, full time, Electronic Materials and Microsystem Technology Division, Head of Electronic Materials and Microsystem Technology Division (’05-), Member and Scientific Secretary of the Electronics and Telecommunication Committee of the Polish Academy of Sciences ('96-), Member of the Microelectronics Section (’93-) and Chairman of the Electron Technology and Electronic Materials Section (‘03-) of the Electronics and Telecommunication Committee, Member of the Micro- and Nanotechnology Section of the Polish Academy of Sciences ('05-), Member of Faculty Council (‘95-), WUT Rector’s Award for Scientific and Didactic Achievements, Scientific Award of the IV Department of the Polish Academy of Science (‘97), Member of IEEE (’97-), V-ce Deen of the Faculty (‘02-‘05), Golden Cross awarded by the President of Poland (’07), Medal of National Education Commission (’07), Dean of Faculty of Electronics and Information Technology (’08-), WUT Rector’s Collective Award for Organizing Achievements (’08), Gold Medal and Diploma with Distinction from Association of Polish Inventors and Rationalizers on International Invention & Innovation Show IWIS-2008, Genius Medal from Association of Hungarian Inventors on International Invention & Innovation Show IWIS-2008. The Certificate is awarded to Mr J.SZMIDT In recognition of participation in the „Al. Bassel Fair For Invention and Innovation” Organized by the: Ministry of Economy and Trade in cooperation with League of Arab States & Association of Syrian Inventors. 20.07.2009

rooms, # 115 GE,
338 GR,
424 GR
phone: +48 222347497,
+48 226257329,
+48 222347599,
+48 222347776,
fax: +48 226257329
e-mail: J.Szmidt@elka.pw.edu.pl

Sławomir Szostak, M.Sc. ('95), Ph.D. (‘01), Microelectronics, Assistant Professor, full time, Microelectronics and Nanoelectronics Devices Division, WUT Rector’s Award for Scientific Achievements (‘02), Secretary of the 6th Symposium Diagnostics & Yield (’03).

room # 362 GE
phone: +48 222347907
fax: +48 226257329
e-mail: szostak@imio.pw.edu.pl

Agnieszka Szymańska, M.Sc. (‘97), Ph.D. (‘02), Microwave Electronics, Optoelectronics, Assistant Professor, 0,9 time, Microwave Electronics and Photonics Division, Member of SPIE (‘97-).

room # 53a GE
phone: +48 222347994
fax: +48 228250393
e-mail:
A.Szymanska.1@elka.pw.edu.pl

Mateusz Śmietana, M.Sc. (’02), Ph.D. (’06) with distinction, Thin Film Plasma Deposition and Optoelectronic Devices, Assistant Professor, full time, Electronic Materials and Microsystem Technology Devices, WUT Rector’s Individual Award for Scientific Achievements (’08).

room # 423b GR
phone: +48 222347932
fax: +48 226288740
e-mail: msmietan@elka.pw.edu.pl

Anna Tyszka-Zawadzka, M.Sc. ('91), Ph.D. ('96) with distinction, Optoelectronics, Quantum Electronics, Assistant Professor, full time, Optoelectronics Division, Grant from Foundation of Polish Science (’95), Member of Association of Polish Electrical Engineers SEP ('96-), Prime Minister Award for dissertation thesis (’97).

room # 120 GR
phone: +48 222345982
fax: +48 226288740
e-mail: A.Tyszka@elka.pw.edu.pl

Jakub Walczak, M.Sc. (’96), Ph.D. (‘02), Microelectronics, Assistant Professor, full time, Microelectronics and Nanoelectronics Devices Division.

room # 234a GR
phone: +48 222347773;
+48 226257329
fax: +48 226257329
e-mail: walczak@imio.pw.edu.pl

Piotr Warda, M.Sc. ('89), Ph.D. ('98) with distinction, Optoelectronics, Assistant Professor, full time, Optoelectronics Division**,** Member of Association of Polish Electrical Engineers SEP ('99-), Prime Minister Award for remarkable technical and science national achievement (‘00).

room # 121 GR
phone: +48 222347772
e-mail: P.Warda@elka.pw.edu.pl

Aleksander Werbowy, M.Sc. ('94), Ph.D. ('99), Microelectronics, Assistant Professor, full time, Electronic Materials and Microsystem Technology Division, WUT Rector’s Award for Scientific Achievements (‘00), Secretary of the Elelectron Technology and Electronic Materials Section of the Polish Academy of Sciences (’03-‘07) and (’07-), WUT Rector’s Award (’06).

room # 422 GR
phone: +48 222347773;
+48 226257329
fax: +48 226257329
e-mail: werbowy@imio.pw.edu.pl

Andrzej Wielgus, M.Sc. (’92), Ph.D. (’03), Microelectronics, Assistant Professor, full time, VLSI Engineering and Design Automation Division, WUT Rector's Award for Scientific Achievements ('04).

room # 354 GE
phone: +48 222347207
fax: +48 228258203
e-mail: wielgus@imio.pw.edu.pl

Piotr Witoński, M.Sc. ('94), Ph.D. (‘00), Microwave Electronics, Optoelectronics, Assistant Professor, full time, Microwave Electronics and Photonics Division, Member of Association of Polish Electrical Engineers SEP ('96-).

room # 56 GE
phone: +48 222347949
fax: +48 228250393
email: P.Witonski@elka.pw.edu.pl

Adam Wojtasik, M.Sc.(‘83), Ph.D.(‘95) with honours, CAD, Assistant Professor, full time, VLSI Engineering and Design Automation Division, WUT Rector’s Award for Scientific Achievements (’89), Ministry of National Education Award for Teaching Achievements in Microelectronics (‘93), WUT Rector’s Award for Scientific Achievements (’96).

room # 353 GE
phone: +48 222347207
fax: +48 228258203
e-mail: wojtasik@imio.pw.edu.pl

Jerzy Woźnicki, M.Sc. ('70), Ph.D. ('79), D.Sc. ('88), Image Processing Techniques, Tenured Professor, full time, Image Processing Division, Head of Image Processing Division ('87-‘09), Dean of the Faculty of Electronics and Information Technology ('90-'96), Rector of Warsaw University of Technology ('96-‘02), Member of the Polish Section of SPIE (‘89-‘90), Member of Committee for Electronics and Telecommunication of the Polish Academy of Sciences (‘89-), Member of Presidential Board of Polish Committee for Optoelectronics (‘90-), Fellow of IEE (‘95-), Member of the Scientific Council of the Institute of Vacuum Technology ('91-‘96), Member of the Advisory Board of the Ministry of Post and Communication ('92-‘96), Member of the Advisory Board of the Ministry of Education ('93-), Governmental Expert of UNESCO (’96-’99), Deputy-President of the Conference of the Rectors of Polish Academic Schools (‘97-‘99), Chairman of the Committee on Legislation of Science and Education (‘97-’99), President of the Conference of the Rectors of Polish Universities of Technology (‘97-’99), President of the Conference of the Rectors of Polish Academic Schools (‘99-‘02), Deputy Chairman of National Council for European Integration (‘99-‘01), Member of National Consultative Council for Reforms in Education (‘99-‘01), Member of Editorial Board of Higher Education in Europe – published by UNESCO (‘99-), Member of International Follow Up Committee of UNESCO World Conference on Higher Education (‘99-‘01), Member of Council of

room # 156 GE
phone: +48 222345419,
+48 228257361
fax: +48 222345419
e-mail: J.Woznicki@imio.pw.edu.pl

European University Association ('99-'02), President of Polish Rectors Foundation ('01-), Chairman of the Presidential Team in Charge of Elaboration of the Project of Law on Higher Education (‘03-‘05), Director of the Institute of Knowledge Society (‘03-), President of the Committee “Poland in United Europe” at Polish Academy of Sciences (’03-), Chairman of the Commission on Organization and Legislation of CRASP and Member of Presidium (’05-), Head of Image and Microwave Photonics Division ('09-).

Agnieszka Zaręba, M.Sc. ('93), Ph.D. ('05), Microelectronics, Assistant Professor, full time, Microelectronics and Nanoelectronics Devices Division, WUT Rector’s Award for Didactic Achievements (’04), WUT Rector’s Collective Award for Scientific Achievements (’08).
room # 339 GR
phone: +48 222347773, +48 226257329
fax: +48 226257329
e-mail: zareba@imio.pw.edu.pl

2.2. Junior Academic Staff

Krzysztof Anders, M.Sc. (‘08), Electronic, Optoelectronic, Ph.D. Student, Optoelectronics Division, supervisor: Michał Malinowski
room # 128b GR
phone: +48 222345047
email: K.Anders@elka.pw.edu.pl

Tomasz Borejko, M.Sc. (‘03), Microelectronics and VLSI Design, Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Wiesław Kuźmicz
room # 352 GE
phone: +48 222347207
email: T.Borejko@imio.pw.edu.pl

Michał Bryk, M.Sc. (‘08), Microelectronics and VLSI Design, Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Wiesław Kuźmicz
room # 357 GE
phone: +48 222347207
email: M.Bryk@elka.pw.edu.pl

Piotr Caban, M.Sc. (‘06), Microelectronics, Electron Technology, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Jan Szmidt
room # 423 GR
phone: +48 222347932
email: P.Caban@elka.pw.edu.pl

Łukasz Chudzian, M.Sc. (‘07), Microelectronics, Electron Technology, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Jan Szmidt
room # 423 GR
phone: +48 222345479
email: L.Chudzian@stud.elka.pw.edu.pl

Piotr Firek, M.Sc. (‘04), Microelectronics, Electron Technology, Assistant, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Jan Szmidt
room # 423b GR
phone: +48 222347932
email: firek@imio.pw.edu.pl

Paweł Gdula, M.Sc. (‘07), Electronic, Optoelectronic, Ph.D. Student, Optoelectronics Division, supervisor: Michał Malinowski
room # 128b GR
phone: +48 222345047
email: P.Gdula@elka.pw.edu.pl

Grzegorz Głuszko, M.Sc. (‘04), Microelectronics, Electronics, Assistant, Microelectronics and Nanoelectronics Devices Division
room # 362 GE
phone: +48 222347907
fax: +48 228253055
e-mail: G.Gluszko@elka.pw.edu.pl

Jarosław Grabowski, M.Sc. (‘05), Microelectronics, Electronics, Ph.D. Student, Microelectronics and Nanoelectronics Devices Division, supervisor: Romuald Beck
room # 232 GR
phone: +48 222347534
email: J.Grabowski@elka.pw.edu.pl

Jacek Grądzki, M.Sc. (‘09), Microelectronics, Electronics, Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Wiesław Kuźmicz
room # 539 GR
phone: +48 222347781
email: J.Gradzki@imio.pw.edu.pl

Ryszard Gronau, M.Sc. (‘04), Microelectronics, Electron Technology, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Jan Szmidt
room # 423 GR
phone: +48 222347932
email: R.Gronau@elka.pw.edu.pl

Marcin Iwanowicz, M.Sc. (‘05), Microelectronics, Ph.D. Student, Microelectronics and Nanoelectronics Devices Division, supervisor: Lidia Łukasiak	room # 362 GE phone: +48 222347907 email: M.Iwanowicz@ elka.pw.edu.pl
Jakub Jasiński, M.Sc. (‘06), Microelectronics, Ph.D. Student, Assistant, Microelectronics and Nanoelectronics Devices Division, supervisor: Lidia Łukasiak	room # 362 GE phone: +48 222347907 email: J.Jasinski@elka.pw.edu.pl
Anna Jusza, M.Sc. (‘08), Ph.D. Student, Optoelectronics Division, supervisor: Michał Malinowski	room # 128b GR phone: +48 222345047 email: A.Jusza@elka.pw.edu.pl
Konrad Kiełbasiński, M.Sc. (‘06), Microelectronics, Electron Technology, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Jan Szmidt	room # 423b GR phone: +48 222347851 email: K.Kielbasinski@elka.pw.edu.pl
Mariusz Klimczak, M.Sc. (‘03), Electronic, Optoelectronic, Ph.D. Student, Optoelectronics Division, supervisor: Michał Malinowski	room # 128b GR phone: +48 222345047 email: M.Klimczak@elka.pw.edu.pl
Krzysztof Kłos, M.Sc. (‘04), Microelectronics, Electron Technology, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Jan Szmidt	room # 423 GR phone: +48 222347932 email: K.Klos@elka.pw.edu.pl
Krystian Król, M.Sc. (‘09), Microelectronics, Electron Technology, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Jan Szmidt	room # 421 GR phone: +48222347779 email: K.Krol@stud.elka.pw.edu.pl
Marcin Koba, M.Sc. (‘06), Optoelectronics, Ph.D. Student, Optoelectronics Division, supervisor: Paweł Szczepański	room # 119 GR phone: +48 222347246 email: M.Koba@elka.pw.edu.pl
Piotr Knyps, M.Sc. (‘09), Nanophotonics, Microelectronics, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Jan Szmidt	room # 028 GR phone: +48222347782 email: P.Knyps@stud.elka.pw.edu.pl
Norbert Kwietniewski, M.Sc. (‘07), Microelectronics, Electron Technology, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Jan Szmidt	room # 423 GR phone: +48 222347932 email: N.Kwietniewski@elka.pw.edu.pl
Kamila Leśniewska-Matys, M.Sc. (‘03), Optoelectronics, Ph.D. Student, Optoelectronics Division, supervisor: Paweł Szczepański	room # 119 GR phone: +48 222347246 email: K.Lesniewska@elka.pw.edu.pl
Katarzyna Ławniczuk, M.Sc. (‘07), Ph.D. Student, Optoelectronics Division, supervisor: Paweł Szczepański	room # 120 GR phone: +48 222345982 email: K.Lawniczuk@elka.pw.edu.pl
Arkadiusz Łuczyk, M.Sc. (‘04), Microelectronics and VLSI Design, Assistant, Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Wiesław Kuźmicz	room # 370 GE phone: +48 222347207 email: A.Luczyk@elka.pw.edu.pl
Krzysztof Madziar, M.Sc. (‘06), Microelectronics, Microwave Electronics, Assistant, Ph.D. Student, Microwave Electronics and Photonics Division, supervisor: Bogdan Galwas	room # 50 GE phone: +48 222345783 email: K.Madziar@elka.pw.edu.pl
Arkadiusz Malinowski, M.Sc. (‘07), Electronics, Microelectronics, Ph.D. Student, Microelectronics and Nanoelectronics Devices Division, supervisor: Andrzej Jakubowski	room # 232 GR phone: +48 222347534 email: A.Malinowski.3@elka.pw.edu.pl

Krzysztof Marcinek, M.Sc. (‘09), Microelectronics, Electronics Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Wiesław Kuźmicz	room # 539 GR phone: +48 222347781 email: K.Marcinek@imio.pw.edu.pl
Andrzej Mazurak, M.Sc. (‘06), Microelectronics, Ph.D. Student, Microelectronics and Nanoelectronics Devices Division, supervisor: Bogdan Majkusiak	room # 234 GR phone: +48 222347534 email: mazurak@supermedia.pl
Mateusz Mroczkowski, M.Sc. (‘09), Microelectronics, Electron Technology, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Jan Szmidt	room # 423b GR phone: +48222347779 email: M.Mroczkowski@stud.elka.pw.edu.pl
Daniel Paluch, M.Sc. (‘05), Microelectronics, Microwave Electronics, Assistant, Ph.D. Student, Microwave Electronics and Photonics Division, supervisor: Bogdan Galwas	room # 50 GE phone: +48 222347949 email: D.Paluch@elka.pw.edu.pl
Piotr Pływaczewski, M.Sc. (‘06), Electronics, Microelectronics, Ph.D. Student, Microelectronics and Nanoelectronics Devices Division, supervisor: Andrzej Jakubowski	room # 232 GR phone: +48 222347534 email: P.Plywaczewski@elka.pw.edu.pl
Michał Rakowski, M.Sc. (‘06), Microelectronics, Ph.D. Student, Microelectronics and Nanoelectronics Devices Division, supervisor: Bogdan Majkusiak	room # 232 GR phone: +48 222347534 email: M.Rakowski@elka.pw.edu.pl
Adam Rudziński, M.Sc. (‘04), Optoelectronics, Ph.D. Student, Optoelectronics Division, supervisor: Paweł Szczepański	room # 120 GR phone: +48 222345982 email: A.Rudzinski@elka.pw.edu.pl
Paweł Sałek, M.Sc. (‘08), Microelectronics, Ph.D. Student, Microelectronics and Nanoelectronics Devices Division, supervisor: Lidia Łukasiak	room # 362 GE phone: +48 222347907 email: P.Salek@stud.elka.pw.edu.pl
Anna Sawicka, M.Sc. (‘09), Microelectronics, Ph.D. Student, Microelectronics and Nanoelectronics Devices Division, supervisor: Lidia Łukasiak	room # 368 GE phone: +48 222347147 email: A.Sawicka@mion.elka.pw.edu.pl
Andrzej Stefański, M.Sc. (‘07), Microelectronics, Electron Technology, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Jerzy Krupka	room # 364 GE phone: +48222347693 email: A.Stefanski@elka.pw.edu.pl
Jędrzej Stęszewski, M.Sc. (‘04), Electronics, Microelectronics, Ph.D. Student, Microelectronics and Nanoelectronics Devices Division, supervisor: Andrzej Jakubowski	room # 232 GR phone: +48 222347534 email: J.Steszewski@elka.pw.edu.pl
Grzegorz Wąchała, M.Sc. (‘07), Microelectronics, Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Andrzej Pfitzner	room # 352 GE phone: +48 222347207 email: G.Wachala@elka.pw.edu.pl
Stanisław Stopiński M.Sc. (‘08), Electronic, Optoelectronic, Ph.D. Student, Optoelectronics Division, supervisor: Michał Malinowski	room # 128b GR phone: +48 222345047 email: S.Stopinski@stud.elka.pw.edu.pl

2.3. Science Research Staff

Name	Degree	Position	Phone number
Małgorzata Kalisz	Ph.D.	Senior Research Worker	+48 222347851
Wojciech Kamiński	Ph.D.	Senior Research Worker	+48 222347145
Mariusz Sochacki	Ph.D.	Senior Research Worker	+48 222347851

2.4. Technical and Administrative Staff

Name	Degree	Position	Phone number
Krzysztof Anders	M.Sc.	Design Engineer	+48 222345047
Anna Bendarek	LIC.	Secretary for Teaching	+48 222345349
Ryszard Biaduń		Senior Foreman	+48 222347851
Witold Ciemiewski		Senior Technician	+48 222347534
Kazimierz Dalbiak		Senior Technician	+48 222347534
Jerzy Domański	M.Sc.	Senior R&D Engineer	+48 222345419
Jerzy Gempel	M.Sc.	Senior R&D Engineer	+48 222347207
Zofia Grzelak	M.Sc.	Senior Clerk	+48 222347771
Jan Gutowski		Supply Manager	+48 222347708
Bożena Janus		Senior Technical Clerk	+48 222347939
Stanisław Jeszka	M.Sc.	Senior R&D Engineer	+48 222347819
Krzysztof Krogulski		Senior Technician	+48 222347535
Bogumiła Kwiatkowska		Reporting Specialist	+48 222347771
Mateusz Mroczkowski	M.Sc.	Design Engineer	+48 222347779
Grzegorz Nowak		Project Clerk	+48 222347949
Urszula Piotrkowicz		Accountant	+48 222347708
Jadwiga Radzyńska		Secretary	+48 222347777
Alina Redlich		Senior Clerk	+48 222347708
Hanna Sater	M.Sc.	Promotion Specialist	+48 222347778
Robert Uklański	M.Sc.	Administration Specialist	+48 222347949

3. TEACHING ACTIVITIES

3.1. Basic Courses

[Edu1] **Algorithms and Data Structures** (Algorytmy i struktury danych), **AISDE**, Adam Wojtasik

[Edu2] **Application of Matlab in Calculation Methods** (Matlab w zastosowanych metodach obliczeniowych) **MZMO**, Mikołaj Baszun

[Edu3] **CAD and Fabrication of Microwave and Lightwave Circuits** (Komputerowe projektowanie i realizacja obwodów mikrofalowych i optofalowych), **KPROM**, Jerzy Skulski

[Edu4] **Computer-Aided Design of Printed-Board Circuits** (Wspomaganie komputerowe projektowania obwodów drukowanych), **PADS**, Ryszard Kisiel, Jerzy Kalenik

[Edu5] **Characterization of Microelectronic Structures and Technologies** (Charakteryzacja struktur i technologii mikroelektronicznych), **CSTM**, Bogdan Majkusiak

[Edu6] **Design of Analog Circuits for VLSI Systems** (Projektowanie układów analogowych dla systemów VLSI), **PUAV** Wiesław Kuźmicz

[Edu7] **Digital Circuits** (Układy cyfrowe), **UCYF**, Elżbieta Piwowarska

[Edu8] **Electronic Elements and Circuits** (Elementy i układy elektroniczne), **ELIU**, Andrzej Pfitzner

[Edu9] **Electronics 1** (Elektronika 1), **ELE1**, Andrzej Jakubowski, Sławomir Szostak

[Edu10] **Electronics 2** (Elektronika 2), **ELE2**, Zbigniew Pióro

[Edu11] **Equipment - Programming Synthesis of Digital Systems** (Synteza sprzętowo – programowa systemów cyfrowych), **SSP**, Elżbieta Piwowarska

[Edu12] **Fields and waves**, (Pola i fale), **POFA**, Jerzy Piotrowski

[Edu13] **Fundamentals of Circuit and System Technology** (Podstawy technologii układów i systemów), **PTUIS**, Romuald Beck

[Edu14] **Fundamentals of Lasers** (Lasery - kurs podstawowy), **LKP,** Paweł Szczepański

[Edu15] **Fundamentals of Microelectronics** (Podstawy mikroelektroniki), **PMK**, Wiesław Kuźmicz

[Edu16] **Fundamentals of Microprocessor Techniques** (Podstawy techniki mikroprocesorowej), **TMIK**, Lidia Łukasiak

[Edu17] **Fundamentals of Microwave Engineering** (Podstawy techniki w.cz.), **TWCZ**, Bogdan Galwas

[Edu18] **Fundamentals of Photonics** (Podstawy fotoniki), **FOT**, Michał Malinowski

[Edu19] **Fundamentals of Solid State Electronics** (Elektronika ciała stałego), **ELCS**, Jan Szmidt, Witold Pleskacz

[Edu20] **Hybrid Systems** (Układy hybrydowe), **UKH**, Ryszard Kisiel

[Edu21] **Integrated Optoelectronics** (Optoelektronika zintegrowana), **OZT**, Michał Malinowski, Agnieszka Mossakowska-Wyszyńska

[Edu22] **Introduction to Microsystems** (Wstęp do mikrosystemów), **WMS,** Zbigniew Pióro

[Edu23] **Introduction to Programming** (Podstawy programowania), **PRM**, Michał Borecki

[Edu25] **Introduction to the UNIX System** (Użytkowanie systemu UNIX), **USUX**, Andrzej Wielgus

[Edu26] **Laser Physics** (Fizyka laserów), **FLA**, Paweł Szczepański

[Edu27] **Logic Circuits** (Układy logiczne), **ULOGE**, Tadeusz Łuba

[Edu28] **Models and Systems of Image Processing** (Modele i systemy przetwarzania obrazów), **MSPO**, Jerzy Woźnicki

[Edu29] **Introduction to Numerical Methods** (Wstęp do metod numerycznych), WD**MNM**, Jerzy Krupka

[Edu30] **Object Programming in Java** (Praktyka programowania obiektowego w Javie), **PPOJ**, Adam Wojtasik

[Edu32] **Object Programming** (Programowanie obiektowe), **PROE**, Adam Wojtasik

[Edu33] **Operating Systems** (Systemy operacyjne), **SOE**, Andrzej Wielgus

[Edu34] **Optoelectronic Devices and Systems** (Elementy i systemy optoelektroniczne), **ESO**, Michał Malinowski

[Edu36] **Physical Fundamentals of Information Processing** (Fizyczne podstawy przetwarzania informacji), **FPPI**, Bogdan Majkusiak

[Edu35] **Physics of Solid State** (Fizyka ciała stałego), **FCSR**, Jan Szmidt

[Edu36] **Programming microcontrollers in C language** (Programowanie mikrokontrolerów w języku C), **PMIK**, Sławomir Szostak

[Edu37] **Semiconductor Devices** (Przyrządy półprzewodnikowe), **PP**, Andrzej Jakubowski, Andrzej Pfitzner

[Edu38] **Standard cell based VLSI designe** (Projektowanie układów VLSI w stylu komórek standardowych), **PUVS**, Zbigniew Jaworski

3.2. Advanced Courses

[Edu39] **Advanced Lightwave Telecommunication** (Zaawansowana telekomunikacja optofalowa), **ZTEOP**, Bogdan Galwas

[Edu40] **Advanced Methods of Optical Information Processing** (Zaawansowane metody optycznego przetwarzania informacji), **ZMOPI**, Janusz Parka

[Edu41] **Advanced Microelectronic and Optoelectronic Technologies** (Zaawansowane technologie mikroelektroniczne i optoelektronczne), **ZTMO**, Romuald Beck

[Edu42] **Advanced Physical Fundamentals of Optoelectronics** (Zaawansowane podstawy fizyczne optoelektroniki), **ZPFO**, Paweł Szczepański

[Edu43] **Digital Image Processing** (Cyfrowe przetwarzanie obrazów), **CPOO**, Piotr Garbat

[Edu44] **Electronic and Photonic Devices for Telecommunication** (Przyrządy elektroniki i fotoniki dla telekomunikacji), **PEFT**, Bogdan Galwas

[Edu45] **Fundamentals of Photovoltaics** (Podstawy fotowoltaiki), **PFOT,** Stanisław Pietruszko

[Edu46] **Integrated and Logic Circuits for Optoelectronics** (Zintegrowane układy optoelektroniczne i optyczne układy logiczne), **ZOUL**, Michał Malinowski

[Edu47] **Lasers – Advanced Course** (Lasery - kurs zaawansowany), **LKZ,** Paweł Szczepański

[Edu48] **Monte Carlo Methods - Fundamentals and Applications** (Metody Monte Carlo - podstawy i zastosowania), **MMC**, Marek Niewiński

[Edu49] **Nanostructures and Nanosystems** (Nanostruktury i nanosystemy), **NIN**, Jan Szmidt, Aleksander Werbowy

[Edu50] **Nanotechnologies** (Nanotechnologie), **NAN**, Jan Szmidt

[Edu51] **Optical Waveguide Lasers and Amplifiers**(Wzmacniacze i lasery światłowodowe), **WLS**, Ryszard Piramidowicz

[Edu52] **Optoelectronics Techniques of Information Processing** (Optoelektroniczne techniki przetwarzania informacji) ,**OTZI**, Janusz Parka, Jerzy Woźnicki

[Edu53] **Photovoltaic Systems** (Systemy fotowoltaiczne), **SFOT,** Stanisław Pietruszko

[Edu54] **Physics Fundamentals of Nanoelectronics** (Podstawy fizyczne nanoelektroniki), **PFN**, Bogdan Majkusiak

[Edu55] **Semiconductor Structures for VLSI and ULSI Circuits** (Struktury półprzewodnikowe dla układów VLSI i ULSI), **SPVU**, Andrzej Jakubowski

[Edu56] **Vision Monitoring Systems** (Systemy monitoringu wizyjnego), **SYMW**, Jerzy Woźnicki

[Edu57] **VLSI System Design** (Projektowanie systemów scalonych w technice VLSI), **PSSV**, Wiesław Kuźmicz, Zbigniew Jaworski

3.3. Courses in English

[Edu58] **Electronics 1, EELE1,** Bogdan Majkusiak

[Edu59] **Laser physics,** Robert Paszkiewicz**,** Athens Programme course

[Edu60] **Physics 3, EPHY3,** Bogdan Majkusiak

[Edu61] **Fundamentals of Nanoelectronics,** Bogdan Majkusiak, Athens Programme course

[Edu62] **Quality Management, EQUMA,** Zdzisław Mączeński

3.4. Courses for other Faculties

[Edu63] **Electronic Circuits and the Introduction to Microelectronics, Faculty of Management** (Układy elektroniczne i wstęp do mikroelektroniki, Wydział Zarządzania), **UEMIK**, Sławomir Szostak

[Edu64] **Electronic Devices, Faculty of Management** (Elementy elektroniczne, Wydział Zarządzania), **ELEME**, Andrzej Jakubowski

[Edu65] **Introduction to Measurements, Faculty of Management** (Podstawy miernictwa, Wydział Zarządzania), **POMIE**, Mikołaj Baszun

[Edu66] **Introduction to Microsystems, Faculty of Management** (Wstęp do mikrosystemów, Wydział Zarządzania), **WMIKS**, Zbigniew Pióro

[Edu67] **Laboratory of Laser Technology, Faculty of Mechatronics** (Laboratorium Techniki Laserów, Wydział Mechatroniki), Ryszard Piramidowicz

[Edu68] **Laser Technology, Faculty of Physics** (Technika Laserów, Wydział Fizyki), **TL**, Ryszard Piramidowicz

[Edu69] **Materials for Electronics and Optoelectronics, Faculty of Management** (Materiały dla elektroniki i optoelektroniki, Wydział Zarządzania), **MATEL**, Zdzisław Mączeński

[Edu70] **Methods of Electronic Element Diagnostics, Faculty of Management** (Metody diagnostyki elementów elektronicznych, Wydział Zarządzania), **MEDEL**, Jan Gibki

[Edu71] **Microtechnologies for Miniature Chemical Systems, Faculty of Chemistry** (Mikrotechnologie dla miniaturowych systemów chemicznych, Wydział Chemiczny), Romuald B. Beck

[Edu72] **Nanotechnologies, Faculty of Management** (Nanotechnologia, Wydział Zarządzania), **NANOT**, Aleksander Werbowy

[Edu73] **Photonic Devices, Faculty of Management** (Elementy fotoniczne, Wydział Zarządzania), **ELFOT**, Ryszard Piramidowicz

4. RESEARCH PROJECTS

Project definitions and descriptions - prepared by Project Leaders.

4.1. Projects Granted by the University

[Pro1] **The Development of Design, Processing and Testing Methods of the Electronic Devices and Materials for Microelectronics and Optoelectronics** (Rozwój metod wytwarzania i badania materiałów oraz modelowania i charakteryzacji przyrządów w dziedzinie mikroelektroniki i optoelektroniki), project leader: Paweł Szczepański, April 2008 - December 2009, **sub-projects:**

[Pro1.1] **A photonic construction for sensors and electronic material examination,** (Charakteryzacja konstrukcji i materiałów dla techniki sensorowej), sub-project leader: Jan Szmidt, co-workers: M.Borecki, M.Bebłowska, P.Wrzosek

It is postulated that without optical capillaries, the microfluidic measuring methods known today could have not existed. However, optical capillaries are rarely used in the LoC photonic micro-systems. It is possible to build photonic sensor heads made of a relatively short optical capillary section, a heater and opto-electronic devices. Such hybrid structures offer new possibilities for testing very small fluid samples in an apparatus reduced in size and cost. We propose a method by which the light propagation in a short capillary section can be calculated from the capillary and light source parameters. We also propose a method of side light coupling into the optical capillaries. We suggest that the hybrid technology based on the silicon sandwiches approach makes it possible to fabricate exchangeable low cost photonic heads with optical capillaries. The proposed micro-litre photonic set-up with local heating and optical capillaries offers a new approach to liquid examination using the index of refraction, turbidity, surface tension, viscosity and vapor pressure information as the determining parameters Therefore liquids with similar refraction coefficients can be recognized when they differ from one another by other parameters than the refraction index. The novelty of the proposed approach lies in the use of time domain information and neural network processing which give more information about the liquid than the static head immersion approach.

[Pro1.2] **Design methodology for RF integrated circuits,** (Metodologia projektowania układów scalonych RF), sub-project leader: Wiesław Kuźmicz

The goal of this project is to extend the IMiOCAD toolset for IC design in order to make it suitable for design and simulation of radio frequency (up to several GHz) integrated circuits. Examples of RF functional blocks will be designed using our extended tools and commercial tools and results will be compared.

[Pro1.3] **Hierarchical structures of 3D shape description applied to merging procedures of spatially uncorrelated fragments of 3D images,** (Wykorzystanie hierarchicznych struktur opisu kształtu powierzchni 3D w łączeniu nieskorelowanych przestrzennie fragmentów obrazów trójwymiarowych), sub-project leader: Piotr Garbat

The project concerns investigations regarding application of iteration algorithms for minimalization of distances between characteristic points of 3D surfaces. Data for characteristic points determination is determinated by the use of spatial (x, y, z) and texture (RGB) information. Proposed multi resolution approach methodology is based on feature points matching in curvature scale space (CSS).

[Pro1.4] **Investigations of microwave devices containing liquid crystals,** (Badania własności mikrofalowych elementów zawierających ciekłe kryształy), sub-project leader: Bogdan Galwas, co-workers: Jarosław Dawidczyk, Jerzy Piotrowski, Jerzy Skulski, Agnieszka Szymańska

Liquid crystals with unique anisotropic features controlled by the electric or magnetic field have been mostly utilized in devices dedicated to optical frequency range. Recently, much attention has been directed on microwave devices with liquid crystals.
The aim of this project is elaboration and investigation of microwave phase shifters based on liquid crystals and verification of idea to apply these electrically tuned devices in modulation and generation circuits.

[Pro1.5] **Modeling and investigation of lasing and amplifying micro-structures and characterization of the optically active materials,** (Modelowanie, opracowanie i badanie mikro-struktur wzmacniających i laserowych oraz charakteryzacja materiałów optycznie aktywnych), sub-project leader: Michał Malinowski, co-workers: P.Szczepański, R.Piramidowicz

Active structures based on rare-earth doped fibers, planar structures, microdisk and spherical waveguides as well as photonic bandgap materials offer an attractive technology for micro-size lasers and amplifiers. In this work we present a general modeling of rare earth-doped fiber, planar, micro-disc and photonic bandgap laser. Approximate analytical results are derived for the threshold and the output intensities. Experimental work is oriented on the investigation of rare-earth doped dielectric glasses and crystals for fiber and planar lasers.

[Pro1.6] **Modification of silicon surface by implanted from r.f. plasma fluorine ions,** (Modyfikacja powierzchni krzemu za pomocą jonów fluoru wprowadzanych z obszaru plazmy w.cz.), sub-project leader: Romuald Beck

The project aims in experimental study of the consequences of exposure of silicon surface to r.f. fluorine containing plasma. The nature of the surface modification is complex and is of both, physical and chemical nature. From the

physical point of view, one can expect ultra-shallow fluorine ions implantation, as well as substrate structure damage. From the chemical point of view, one can expect also formation of silicon-fluorine bonds and particles. In this work we will attempt to characterize the effects and find out the possibility to control them by plasma process parameters.

[Pro2] **The Development of Design, Processing and Testing Methods of the Electronic Devices and Materials for Microelectronics and Optoelectronics** (Rozwój metod wytwarzania i badania materiałów oraz modelowania i charakteryzacji przyrządów w dziedzinie mikroelektroniki i optoelektroniki), project leader: Paweł Szczepański, June 2009 - March 2010, **sub-projects:**

[Pro2.1] **Analysis, modeling and investigation of waveguide structures for amplifiers and lasers and characterization of optically active materials,** (Analiza, modelowanie i badanie światłowodowych struktur wzmacniających i laserowych oraz charakteryzacja materiałów optycznie aktywnych), sub-project leader: Michał Malinowski, co-workers: P.Szczepański, R.Piramidowicz

Waveguide, active structures based on rare-earth doped fibers, planar structures, microdisk and photonic bandgap materials offer an attractive technology for micro-size amplifiers and lasers. One of the recent important developments is the successful operation of fiber lasers, which offer the highest efficiencies and the best thermal working conditions among solid-state lasers. Fiber lasers not only could be easily coupled to optical telecommunication fiber components, but also give output powers exceeding kW cw range. In this work we present a general modeling of rare-earth doped fiber and planar lasers, including up-conversion lasers. Approximate analytical results are derived for the threshold and the output intensities. Experimental work is oriented on the investigation of fiber lasers based on Pr, Ho and Nd ZBLAN glass, and epitaxial,planar crystalline RE:YAG/YAG structures.

[Pro2.2] **Characterization of construction and materials used for microsystems sensors technolog,y** (Chrakateryzacja konstrukcji i materiałów dla mikrosystemowych technik senorowych), sub-project leader: Jan Szmidt

This work bases on a review, of the published literature and on the authors' own research, of the current state of the art of fiber-optic capillary sensors and related instrumentation as well as their applications, with special emphasis on point-of-care chemical and biochemical sensors.

In the first part of our work we systematize the various types of sensors from the point of view of the principles of their construction and operation. In the second part we look at microsystems sensors technology that uses multi-parametric and multi-functional optical capillary component. Unlike classical fiber-optic sensors which rely on changes in light propagation inside the fiber as affected by outside conditions, optical capillary sensors rely on changes of light transmission in capillaries filled with the analyzed liquid, which opens the possibility of interesting new applications, while raising specific issues relating to the construction, materials and instrumentation of those sensors.

[Pro2.3] **Effects of silicon gate region modification with fluorine on the properties of MOS devices** (Wpływ modyfikacji powierzchni krzemu w obszarze bramki fluorem na właściwości struktur MOS), sub-project leader: Romuald Beck

The project aims in experimental study of the consequences of exposure of silicon surface to r.f. fluorine containing plasma. The nature of the surface modification is complex and is of both, physical and chemical nature. From the physical point of view, one can expect ultra-shallow fluorine ions implantation, as well as substrate structure damage. From the chemical point of view, one can expect also formation of silicon-fluorine bonds and particles. In this work we will attempt to characterize the effects and find out the possibility to control them by plasma process parameters.

[Pro2.4] **Liquid crystal cells in GHz range and structural analysis of 3D objects (**Ciekłokrystaliczne przetworniki w zakresie GHz i analiza struktur obiektów 3D**),** sub-project leader: Janusz Parka

Liquid crystals physical properties in the GHz range are strongly investigated last years. Low loss nematic liquid crystals materials with high dielectric properties and in optical range in tunable GHz phase shifter construction ware used. Theoretical problems of wave propagations in such type of chase shifter was discussed. Application properties and possibility of improving parameters of this device and tunability problems in 10 - 30 GHz are considered.

[Pro2.5] **Research on the physical models applied for device simulation in submicrometer IC technologies,** (Badania modeli fizycznych dla symulacji elementów układów scalonych w technologiach submikrometrowych), sub-project leader: Andrzej Pfitzner, co-workers: J.Gempel, G.Janczyk, Z.Jaworski, S.Jeszka, D. Kasprowicz, W.Kuźmicz, E.Piwowarska, A.Pfitzner, W.Pleskacz, A.Wielgus, A.Wojtasik

Scaling of semiconductor devices comes to the applicability limit of macroscopic models of the physical phenomena occuring in the active regions of IC devices. Research cover simulation experiments comparing DC characteristics of the chosen nanometric devices, obtained using drift-diffusion, thermodinanic and hydrodynamic models, and exploration of such devices parameter space.

[Pro3] **Fiber laser with a loop reflector,** (Laser włóknowy z rezonatorem pętlowym), project leader: Ryszard Piramidowicz, April 2009 – December 2009

Project was aimed at design, development and characterization of a compact erbium doped fiber laser with fiber loop resonator. The project's tasks covered detailed analysis of spectroscopic properties of erbium doped preforms and fibers, theoretical modeling of fundamental lasing properties, design and preparation of laser components, and, finally, manufacturing and characterization of fiber laser. A number of technical problems have been solved, which resulted in development of compact and robust, all-fiber design of fiber laser, suitable both for didactic purposes and research works.

[Pro4] **Investigations of influence of annealing temperature on electrophisical properties of thin barium titanate layers** (Badanie wpływu temperatury wygrzewania na właściwości elektrofizyczne cienkich warstw tytanianu baru), project leader: Jan Szmidt, April 2009 – December 2009

The barium titanate layers were deposited on p-type <100> silicon substrates using radio frequency plasma sputtering method. After annealing in range from 300°C to 800°C in Ar or O_2 atmosphere round aluminum (Al) electrodes were evaporated on the top of deposited layers. Thus metal-insulator-semiconductor (MIS) structures were created with $BaTiO_3$ films acting as the insulator layer which enabled electrical characterization (current-voltage and capacitance-voltage measurements) of produced layers. With the use of scanning electron microscopy and atomic force microscopy the morphology of deposited and annealed layers was investigated.

The results of the experimental work have enabled analysis of the influence of annealing on electrophisical parameters of obtained layers.

[Pro5] **Optically active composite materials for applications in optical amplifiers and solid state lasers,** (Aktywne optycznie materiały kompozytowe do zastosowań w układach wzmacniaczy optycznych i laserów ciała stałego), project leader: Ryszard Piramidowicz, April 2009 – December 2009

This project, being the result of joint activity of three faculties of Warsaw University of Technology (i.e. Faculty of Electronics and Information Technology, Faculty of Materials Science and Engineering and Faculty of Chemistry), was aimed at developing, fabrication and characterization of active composite materials based on polymers containing Al_2O_3 nano-ceramics doped with rare-earth ions, for applications in new generation optical amplifiers and coherent radiation sources. Scope of the work encompassed fabrication of composite host materials based on two selected polymers of different properties – PMMA and PDMS. Optically active phase was the aluminum oxide (Al_2O_3) nano-ceramics doped with rare-earth ions (Tm^{3+}, Pr^{3+}, Ho^{3+}, Yb^{3+}). Obtained nano-composite structures were provided with full physical, chemical, as well as quantitative and qualitative description, along with a versatile optical characterization with methods of high-resolution, excitation and emission laser spectroscopy. The Project also allowed for determination of key parameters of multi-ion and multi-photon interactions resulting in energy transfers among the active centers and processes of non-radiative relaxation of their excited energy states. Obtained set of experimental data is an important input to further research focused on numerical modeling of optical amplification and laser action processes in the studied structures, which in turn would enable validation of their optoelectronics applicability and elaboration of optimization schemes for their optical parameters.

[Pro6] **Short-wavelength emission in neodymium and holmium doped fluorozirconate fibers**, (Zagadnienie emisji krótkofalowej w światłowodach fluorocyrkonowych domieszkowanych jonami neodymu i holmu), project leader: Michał Malinowski, co-worker: Mariusz Klimczak, April 2009 – December 2009

Dynamic development of optoelectronics and photonics witnessed in the recent years, stimulated in the first place by growing demand for new imaging techniques, data recording and information processing, necessitates search for new, efficient sources of short-wavelength coherent radiation (visible and UV). Apart from solutions in the area of wide band-gap semiconductors or frequency multiplication effects, optical fiber lasers based on low-phonon glasses doped with rare-earth ions are continuously considered as potential, highly efficient coherent sources in the short-wavelength part of spectrum.

The main goal of the project is therefore study and complex analysis of phenomena and factors shaping visible and near-UV (UV-violet) emission properties of fluorozirconate ZBLAN-type bulk and optical fiber glasses, activated with either trivalent neodymium or holmium ions, which although known to have UV-violet emission potential, ramian relatively unexplored in this context. General purpose of planned work is within research for new optically active dielectric materials for applications in optoelectronics.

The essence of problem was to explore and identify short-wavelength (UV-violet) emission properties of ZBLAN glasses doped with Nd^{3+} and Ho^{3+} ions under various excitation conditions. Scope of work assumed a complex analysis of spectral properties of Nd:ZBLAN and Ho:ZBLAN in the visible and ultraviolet ranges of wavelengths, comprising specifically analysis of absorption spectra, emission and excitation spectra and emission dynamics in a wide range of operating temperatures. Disentangling and identification of scarcely explored subtle structure of Stark sub-levels of high-energy excited states of both ions in a glassy material has been attempted. Detailed experimental approach and comparison analysis of recorded spectral and dynamics characteristics of metastable energy levels at different dopant concentrations of active ions have been used to identify and discuss properties of multi-ion and multi-photon processes, responsible for up-conversion phenomena populating high-lying excited states, including $^2F(2)_{5/2}$, $^4D_{3/2}$ and $^2P_{3/2}$ of Nd^{3+} ions, as well as $^3P_1$+$^3D_3$, $^3K_7$+$^5G_4$ and $^5G_5$ of Ho^{3+} ions. Excitation conditions of $^2F(2)_{5/2}$ level and its dopant concentration-dependent competition with $^4D_{3/2}$ and $^2P_{3/2}$ has been described. Two-photon and three-photon up-conversion excitation schemes populating $^4D_{3/2}$ and $^2P_{3/2}$ of Nd^{3+} ions and $^3P_1$+$^3D_3$ of Ho^{3+} ions have been numerically analyzed with specific attention and compared with classic, single-photon pumping. Experiments and results with excitation of anti-Stokes UV-violet emission in Nd:ZBLAN and Ho:ZBLAN optical fibers have been conducted and described.

Results have been reported in a number of peer-reviewed international journals and foremost of all, in form of Ph.D. dissertation prepared by Mariusz Klimczak, as required by this formula of scientific project.

4.2. Projects Granted by the Ministry of Education and Science

[Pro7] **Contact and assembly technologies for high temperature, high power and high frequency applications of SiC devices**, (Technologia kontaktów i montażu dla przyrządów z węglika krzemu do zastosowań wysokotempearturowych, wysokomocowych i wysokoczęstotliwościowych) Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Ryszard Kisiel, co-workers: Zbigniew Szczepański, Marek Guziewicz, Norbert Kwietniewski, Ryszard Biaduń, April 2007 - March 2010

The aim of the project is to elaborate the ohmic contact technology for SiC devices as well as assembly technique for electrical and mechanical connection between SiC structure and package. An elaborated package shall be able to work in high temperature (up to 400°C), high power and high frequency application.

[Pro8] **Deposition and measurements of thin metal and dielectric films intended for nanoelectronics and microwave technique,** (Wytwarzanie i charakteryzacja cienkich warstw metalicznych i dielektrycznych dla potrzeb nanoelektroniki i techniki mikrofalowej), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jerzy Krupka, co-workers: Jan Szmidt, Marek Guziewicz, Zdzislaw Mączeński, Mikolaj Baszun, Norbert Kwietniewski, April 2007 - April 2010

New nanotechnologies require not only high resolution photolithographic processes but also deposition of very thin (the order of few nanometers) metal and dielectric films having repeatable and electromagnetic properties. When film thickness becomes very thin their physical properties may be different than the properties of bulk materials or thin films having thickness in the range of microns. In the addition traditional measurements methods may be not adequate for very thin films characterization. The main goal of this project is deposition and characterization of extremely thin metal and dielectric films. Single post and split post dielectric resonator techniques will be used for measurements of the surface resistance of thin metal films deposited on low loss dielectric substrates. Al, Cu, Ag, Au, Fe, Mo, W, Pd, Pt and ITO films will be measured employing those resonators. For comparison DC and low frequency measurement techniques will be also employed.

[Pro9] **Electrical characterization of dielectric-semiconductor interface in advanced MOS structures,** (Elektryczna charakteryzacja powierzchni granicznej dielektryk-półprzewodnik w zaawansowanych strukturach MOS), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Lidia Łukasiak, October 2008 – March 2010.

The aim of this project is to adapt the charge pumping method to advanced MOS structures, i.e. conditions of strong coupling between top and back interfaces and considerable leakage current.

[Pro10] **Electronic detectors and chemical sensitive devices with diamond and diamon-like carbon (dlc) films, (**Elektroniczne detektory i przyrządy chemoczułe z warstwami diamentowymi i diamentopodobnymi**)**, Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jan Szmidt, September 2006 – September 2009

The main goal of the project is designing the structure and subsequent fabrication of at least 3 prototypes of an ionizing radiation detector and chemical sensitive devices, where the role of active (i.e. detecting) regions play diamond and diamond-like carbon (DLC) films of varied phase composition, structure and surface morphology.

Diamond and DLC layers will be produced by means of radio frequency (RF) or/and microwave (MW) plasma chemical vapor deposition (CVD) techniques as well as using hot filament chemical vapor deposition (HF CVD) and impulse plasma deposition (IPD) methods.

Fabrication of optical fiber and planar waveguide-based detectors as well as microelectronic devices (open-gate field effect transistor, diamond film/metal or diamond film/silicon heterojunction structures) is anticipated.

[Pro11] **Emission properties of the active oxide materials with periodic structure,** (Właściwości emisyjne aktywnych materiałów tlenkowych o periodycznym uporządkowaniu), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Marcin Kaczkan, May 2008 – November 2009

The aim of the project is to investigate and analyze spectroscopic properties of optically active micro- and nano-materials with periodic structure. These type of structures are interesting as host materials, in which active ions may have different properties compared to those they have in bulk crystals. In particular, influence of the eutectic structure properties on the rare-earth ions behavior will be investigated. Emission properties of the spectrally selected groups of active ions in $Tb_3Sc_2Al_3O_{12}/TbScO_3$, $Tb_3Sc_2Al_3O_{12}$/air, air/$TbScO_3$, ($Yb_3Al_5O_{12}/Yb_4Al_2O_9$):(1,5%)Er, and ($Yb_2O_3/Yb_4Al_2O_9$):(1,5%)Er oxide-oxide eutectic will be examined with the help of high-resolution laser spectroscopy. Additionally, the spectroscopic analysis for the bulk crystals with the same structures as constituents of eutectic will be perform. This analysis will enable determination of the influence of eutectic structure on the electron relaxation processes in the excited active ions.
Results of the project will enhance the knowledge about processes occurring in solid-state active media which have never been investigated in this manner.

[Pro12] **Ferroelectric smectic LC materials in holographic recordings,** (Ciekłokrystaliczne smektyczne materiały o właściwościach ferroelektrycznych do zapisów holograficznych), Military University of Technology, Faculty of Advanced Technologies and Chemistry, project leader: Janusz Parka, co-worker: Marek Sutkowski, October 2008 – October 2010.

The goal of the project is to achieve holographic recordings in thin smectic ferroelectric liquid crystal layers. The optical recording of the gratings is performed with use of low-power coherent laser beams (with different wavelengths). Bistable SSFLC (Surfce Stabilised Ferroelectric Liquid Crystal) effect should be used to allow possibility of re-writable properties of the recordings.

[Pro13] **High temperature spectroscopy of rare-earth doped crystals and nanocrystals for luminescence thermometry applications, (**Spektroskopia wysokotemperaturowa kryształów i nanokryształów tlenkowych domieszkowanych jonami ziem rzadkich dla zastosowań w termometrii luminescencyjnej**)** Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Michał Malinowski, August 2009 – February 2012

Phosphor thermometry is being used for non-contact measurements in difficult and hostile high temperature environments. In particular, temperature measurements inside various engines, jet turbines or similar devices are especially amenable to fluorescence techniques. Suitable phosphors could cover temperature ranges from –265 to 1600 °C. The aim of this work is to study the temperature dependence of the luminescence spectra and decays characteristics of rare-earth (Tb, Dy, Eu, …) activated nanopowders and thin films of YAM, YAG and Y_2O_3 crystals. Also, the temperature dependence of the up-conversion emissions will be studied over a wide temperature range.

[Pro14] **Light generation in planar waveguide lasers based on two dimensional photonic crystals** (Generacja promieniowania w falowodowych laserach planarnych wykonanych na bazie dwu-wymiarowych kryształów fotonicznych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Paweł Szczepański, co-worker: Kamila Leśniewska-Matys, March 2009 – March 2010.

The aim of the project is semi-analytical supermodes analysis of the structure comprising N-coupled planar waveguides manufactured on the base of two dimensional photonic crystal active material. Next, it is possible to create a model of nonlinear operation of such a phased array laser with Fabry-Perot cavity. The analysis is based on energy theorem approach which allows investigation of the influences of real structure parameters i.e. photonic crystal and waveguides geometry for output power level. In particular, the effect of radius of an air column, period of photonic crystal lattice in the horizontal direction (triangular and square symmetry), distance between waveguides, number of waveguides, thickness and length of active structure on output power level and maximal power efficiency is analyzed.

[Pro15] **Modeling and characterization of multigate MOS SOI structures** (Modelowanie i charakteryzacja wielobramkowych struktur MOS SOI), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: A. Jakubowski, co-workers: B. Majkusiak, L. Łukasiak, R.B. Beck, J. Gibki, S. Szostak, J. Walczak, A. Zaręba, G. Głuszko, D. Tomaszewski, October 2007 – October 2010

The aim of the project is analysis of electrical characteristics of multi-gate MOS structures and development of methods of characterization, as well as modeling of selected physical phenomena present in multigate MOS devices and their parameters and electrical characteristics.

[Pro16] **Modeling and characterization of semiconductor devices fabricated on silicon carbide cubic (3C-SiC) and hexagonal (4H-SiC) polytype substrates,** (Modelowanie i charakteryzacja przyrządów półprzewodnikowych wytworzonych na kubicznej (3C-SiC0 oraz heksagonalnej (4H-SiC) odmianie węglika krzemu), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Andrzej Jakubowski, October 2008 – February 2010.

The aim of the project is to develop a set of accurate models of the fundamental parameters and devices (VDMOSFET, MOSFET, MESFET, MIS capacitor, gate diode) fabricated on 3C-SiC and 4H-SiC.

The models are verified by means of characterization of test structures manufactured by a foreign research partner - Acreo AB, Sweden.

Charge pumping is a novel method used for characterization of silicon carbide. Two-level and three-level charge pumping methods are adapted to studying the interface traps of the 3C-SiC and 4H-SiC VDMOSFETs.

[Pro17] **Modeling of silicon structures with low-dimensional electron gas, (**Modelowanie struktur krzemowych z niskowymiarowym gazem elektronowym**),** Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: J. Walczak, co-workers: B. Majkusiak, R.B. Beck, A. Mazurak, May 2007 – May 2010

The project relates to modeling Si and also SiGe structures with 2DEG (two dimensional electron gas – quantum plane) and 1DEG (quantum wire). The main goal is the developement and implementation of physical models of complex structures comprising a plurality of ultrathin semiconductor and dielectric layers, along with the analysis of obtained electrical characteristics of the modeled devices.

[Pro18] **Nanostructural carbonaceous films for cold emitters** NANOCAFE – MNT-ERA NET, (Zimne emitery elektronów oparte o nanostrukturalne warstwy węglowe **MNT-ERA NET**), leading institution: Tele- and Radioresearch Institute, task executor: Warsaw University of Technology, Institute of Microelectronics, project leader: Elżbieta Czerwisz, task leader: Jan Szmidt, co-workers: Jerzy Kalenik, Piotr Firek, Mateusz Mroczkowski, Ryszard Biadań, Krystyna Szylko, Krystian Król, March 2009 – February 2011.

The goal of the project is preparation of a new type of cold cathode based on nanocomposite material that is nanostructural carbonaceous film and design of prototype device based on the cathode.

This film consists of composite nanostructural material built of carbon nanotubes, carbonaceous and metal nanocrystals. The film based cold electron sources will be designed as a new type of cold electron emitters. Practical goal of this project design a prototype of a new cold cathode that shall be used in bright displays of new type.

[Pro19] **Next generation teleinformatics service and nets – technology, application and market aspects. Development of technology and algorithms for telemedicine services using of Internet and cell telephone nets,** (Usługi i sieci teleinformatyczne następnej generacji – aspekty techniczne, aplikacyjne i rynkowe. Rozwój technik i algorytmów telemedycyny z wykorzystaniem Internetu oraz sieci telefonii komórkowej), Warsaw University of Technology, Institute

of Microelectronics and Optoelectronics, project leader: Mikołaj Baszun, January 2008 – December 2010.

The aim of the project is development of technology and algorithms for services with using of Internet and cell telephone nets for telemedicine applications. The project obeys the following tasks:

- Working out of new algorithms for clasifications and/or categorizations of the physician tasks aspected from a remote outdoor pacient, for application in serwer expert systems.
- Design of serwer services using secure and authentified remote wireless communication of the physicians with the patients, based on uncertain data.
- Design and realizing of practical models of intelligent electronic modules for monitoric of the diagnostic data of an outdoor human beeing, without his engagement.
- Design of a specialized serwer databases for telemedicine applications, with communication history and secure access tools.
- Design data of new algorithms for clasifications and/or categorizations of a physician tasks aspected from a remote outdoor pacient.
- Software implementation of serwer services using secure and authentified remote wireless communication of physicians with patients.
- Practical models of intelligent electronic modules for monitoric of the diagnostic data of an outdoor human beeing.
- Software implementation of secure serwer databases for telemedicine applications.

[Pro20] **Optoelectronic mikrosystem to make research of samples about nano-liters volumes with using the optical capillaries,** (Mikrosystem optoelektroniczny do badania próbek o nanolitrowych objętościach z wykorzystaniem kapilar optycznych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jan Szmidt, co-worker: Paweł Wrzosek, October 2007 – October 2010

The main aim the project is to study the new, original method to make research of liquid samples about 10 – 9 liters volume, it means possibility of the analysis physics-chemical drop.

Final measurable work effect will be laboratory computer system to analysis chosen liquid parameters together with software to visualization of measuring results.

[Pro21] **Process of spontaneous emission in photonic crystals,** (Proces emisji spontanicznej w kryształach fotonicznych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Paweł Szczepański, co-worker: Adam Rudziński, October 2008 – February 2011

The aim of this project is to develop an analytical model describing the process of spontaneous emission in structure of one-dimensional photonic crystal, that would account for parameters and defects of the structure, as well as spatial distribution of the active medium. The model will be based on quantum theory of interaction of light and matter, and the effective resonator model, used for the description of the photonic crystal's structure. Constructed model will allow to analyze many aspects of the phenomenon, but it could be also used as a tool for designers of modern optoelectronic devices, like distributed-feedback laser resonators, high efficiency light-emitting diodes or dielectric coatings.

[Pro22] **Technology and characterization of MIS structures with double gate dielectric stacks for non-volatile semiconductor memory (NVSM) applications** (Technologia i charakteryzacja struktur MIS z podwójną warstwą dielektryka bramkowego dla zastosowań w nieulotnych pamięciach półprzewodnikowych (NVSM)), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Robert Paweł Mroczyński, co-workers: Andrzej Jakubowski, Romuald Beck, Agnieszka Zaręba, Sławomir Szostak, Grzegorz Głuszko, Jarosław Grabowski August 2009 – August 2012.

The aim of this work is development technology of MIS structures with double gate dielectric stacks based on high-k dielectric layers (e.g. hafnium dioxide – HfO_2). The first objective of this project is to design a new set of photolitography masks with MIS/MISFET structures, allowing fabrication of semiconductor devices in self-aligned or non-self aligned technology. In the second part, MIS devices with different gate dielectric structures will be fabricated. The gate structure will consist of pedestal layer obtained by plasma enhanced chemical vapor deposition (PECVD) and high-k dielectric layer (fabricated by MOCVD, ALD, reactive sputtering) as top layer. In the third part of this work fabricated MIS devices will be fully characterized by means of electrical characterization (capacitance-voltage and current-voltage characteristics, charge pumping, CVS and CCS) and investigated from the viewpoint of non-volatile semiconductor memory (NVSM) applications. Significant part of this work will be also investigations of radiation damage influence onto electrical properties of MIS/MISFET devices with double gate dielectric stacks.

[Pro23] **The Electron Cold Emission from Carbon layers (technology and characterization),** (Warstwy węglowe na potrzeby zimnej emisji elektronów (technologia i charakteryzacja)), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jan Szmidt, co-worker: Ryszard Gronau May 2008 – November 2009

The aim of this work is to research correlations between the efficient electron cold emission and the parameters of plasma carbon layers deposition. The authors would like to present the influence of the choice of plasma methods process and process parameters on electron emission ability. The intention of this work is to analyse the conditions of effective electron cold emission from layres deposition in different plasma methods, thus layers with diverse physical, chemical (microstructure, phase compostion, etc.), electro physical properties.

The layers were made by few plasma methods:

Radio Frequency Plasma Assisted Chemical Vapor Deposition (RF PA CVD),

Hot Filament Chemical Vapor Deposition (HF CVD),

Dual Frequency RF/MW Plasma Chemical Vapor Deposition (DF RF/MW PCVD),
Reactive Impulse Plasma Assisted Chemical Vapour Deposition IPD.

[Pro24] **The new optoelectronics method of intelligent classification of liquid bio-fuels properties with optical capillary use** (Nowa metoda optoelektroniczna inteligentnej klasyfikacji właściwości użytkowych biopaliw ciekłych z wykorzystaniem kapilar optycznych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Michał Borecki, March 2009 – March 2012.

The proposed microliter photonic sensor setup with local heating and optical capillaries offers a new approach to liquid examination using the index of refraction, turbidity, surface tension, viscosity and vapor pressure as the determining parameters, which can be correlated with biological or chemical information. The novelty of the proposed approach to sensor devices lies in the use of time-domain data and neural network processing, which gives more information about the liquid in question than the traditional static sample examination approach.

In the first part of our work, we analyze the operating principles and various aspects of the construction of the optical capillary head. We look at transparent liquids. We go on to discuss the possibilities of using replaceable heads as a practical means of realizing the systems. The second part of our work discusses the principles of optoelectronic intensity signal detection, including the aspects of speed, accuracy and simplicity of the test instrument and ways of reducing the dependence of the sensor's sensitivity.

The principles of sensor operation will be described using examples of liquid fuels and bio-fuels. In this context, we discuss the relationship of the physically measured test-cycle data and the proper choice of features for the artificial neural network classification algorithm that we use. We intend to demonstrate that combined biological, chemical and physical analysis also leads to proper feature selection and sample classification.

[Pro25] **Thin barium titanate layers for microelectronics demand – technology, characterization and applications,** (Warstwy tytanianu baru na potrzeby mikroelektroniki- technologia,charakteryzacja i próby aplikacji), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jan Szmidt, co-worker: Piotr Firek, October 2008 – March 2010.

The main goal of the project is development of the fabrication method of high-k and high-resistive $BaTiO_3$ thin films and investigation of its properties from the viewpoint of electronics applications.
Development of the fabrication technology ($BaTiO_3$ deposition, selective etching) will allow for producing of the test structures, like MIM, MIS capacitors, field-effect transistors (FETs) and ion sensitive field-effect transistors (ISFETs) with discussed layers as a gate insulator.

[Pro26] **Unipolar devices and transistors for high-temperature electronics, (**Przyrządy unipolarne I struktury tranzystorowe na potrzeby elektroniki wysokotemperaturowej), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jan Szmidt, co-worker: Mariusz Sochacki. May 2007 – April 2010

Schottky diodes and field effect transistors (MOSFET and JFET) for high-temperature electronics have been designed, developed, measured and characterized. The abovementioned structures have been tested within temperature range from 20°C up to 400°C.

[Pro27] **Universal laser source for medical applications,** (Uniwersalne źródło promieniowania laserowego do zastosowań medycznych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Wojciech Kamiński, March 2009 – March 2012.

The scientific aim of the project is to research all effects appearing in ion laser tubes, especially to find knew effects which are not known in literature. These effects could have significant influence on parameters of argon-krypton ion lasers which are developed and produced in Institute of Microelectronics and Optoelectronics. The analysis of discovered effects allows defining laser parameters important for medical application.

[Pro28] **Vertical Slit Devices for Integrated Circuits,** (Technologia elementów z pionową szczeliną dla układów scalonych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, 7PR UE, project leader: Wiesław Kuźmicz, June 2008 – January 2009.

The objective of this project is to assess feasibility of a new paradigm of manufacturing and design of silicon integrated circuits that addresses several manufacturing and design bottlenecks and roadblocks recognized as major obstacles in nanometer scale (down to 22 nm and beyond) technologies.

A new semiconductor device structure, a new IC layout style as well as a new IC manufacturing technology have been conceived with a single common objective in view: to minimize IC design and manufacturing costs maintaining or even increasing their maximum complexity and performance. The new paradigm leads to highly regular IC structures making lithography much easier, possibly OPC-free. This in turn leads also to a new simple layout design style, thus dramatically reducing NRE costs of new products and reducing time to market. Contrary to other "beyond CMOS" concepts, the proposed manufacturing process is based on well industry proven and accepted elementary processes. Some of them, however, have to be applied in a nonstandard and nontrivial way.

The active devices manufactured in the new way are expected to have the following properties:

1. Both unipolar and bipolar devices are manufacturable in the same process.
2. Devices of complementary types are available.
3. All devices have four terminals and provide new possibilities for applications in digital and analog circuits; however, they can be also used in conventional ways.
4. Small critical dimensions (channel length, base width) can be achieved with lithography of moderate resolution.

The main goal of this project is to investigate the properties of the new devices and the circuits based on them, to estimate their performance limits and to assess their manufacturability, by means of TCAD-based simulations and manufacturing experiments.

4.3. Projects Granted by International Institutions

[Pro29] **Center of Nanophotonics** (Centrum nanofotoniki), EU structural project, project leader: Paweł Szczepański, co-worker: Ryszard Piramidowicz, 2009 – 2011

Project POIG. POIG.02.02.00-00-004/08 „Center of Nanophotonics" is realized in the scope of priority 2.2 of Operational Programme Innovative Economy by a consortium led by Institute of Electron Technology. Project is focused on development of a distributed competence center, having highest-level expertise and technical competences in the field of nanophotonic materials and devices. Institute of Microelectronics and Optoelectronics is one of the main consortium's partners and is responsible for developing laboratory of infra-red spectroscopy oriented towards versatile optical characterization of nano-photonic materials.

[Pro30] **Establishing of innovative, complementary laboratories dedicated to advanced research in micro-, nano- and optoelectronics,** (Utworzenie grupy innowacyjnych komplementarnych laboratoriów badawczych w obszarze mikro-, nano- i optoelektroniki), EU structural project, project leader: Paweł Szczepański, co-worker: Ryszard Piramidowicz, 2009 – 2011

Project POIG.02.01.00-14-138/08 „Establishing of innovative, complementary laboratories dedicated to advanced research in micro-, nano- and optoelectronics" is realized in the scope of priority 2.1 of Operational Programme Innovative Economy by Institute of Microelectronics and Optoelectronics and Institute of Electronic Systems.

The main aim of the Project is the development of a cluster of complementary laboratories, equipped with state-of-the-art research apparatus, offering high quality scientific services in the field of advanced electronic and photonic technologies. Investments of total value of 7 million EUR will complete R&D base of the laboratories, which shall result in establishment of a laboratory octagon, having at its disposal appropriate scientific expertise, as well as laboratory and prototyping base. State-of-the-art scientific infrastructure, being the primary result of the Project, shall enable more intense participation of IMiO and ISE research teams both in European projects, and large domestic projects involving industrial partners. It shall further allow enhancement of training actions necessary for education of market-demanded, high-quality specialists and professional improvement of employees of various industrial partners.

[Pro31] **IC design skills for advanced DSM technologies, European Commission 7 Framework Programme – Project IDESA (contract No. 215180)**, Projekt 7 Programu Ramowego UE, project leader: Wiesław Kuźmicz, December 2007 – November 2009

The mission of this project is to bridge the gap between the industrial design flows, methodologies and tools that have already reached maturity for the 90 nm technology node and are being quickly extended to 65 nm, 45 nm and beyond, and the design knowledge, competences and skills at European universities, which are insufficient to introduce these industrial design methods and flows to university curricula. A European-scale supporting action will help to acquire quickly the necessary knowledge and skills, in this way reducing by many orders of magnitude the total efforts that would be needed if the European universities tried to cope with new design problems and master new design techniques and tools individually and independently.

[Pro32] **Innovative technologies of multi-functional materials and structures for nanoelectronics, photonics, spintronics and sensors InTechFun,** (Innowacyjne technologie wielofunkcyjnych materiałów i struktur dla nanoelektroniki, fotoniki, spintroniki i technik sensorowych InTechFun), EU structural project, project leaders: Jan Szmidt, Wojciech Gwarek (The Institute of Radioelectronics WUT), project coordinator: Institute of Electron Technology, polish partners: Institute of Electron Technology, Institute of Physics Polish Academy of Science, Silesian University of Technology, Technical University of Lodz, Military University of Technology, 2009 – 2013

The main aim of this project is to integrate different semiconductors and technologies and develop new semiconductor devices based on creative and innovative technological solutions and designs. The project is focused on wide bandgap materials like zinc oxide and related films, gallium nitride and related epitaxial layers, silicon carbide. The functional thin layers for ohmic and rectifying contacts, interconnections, gate dielectrics and passivation have been developing based on four material groups: stable thermal oxides, nitrides, carbides and borides. The thin film technology includes fabrication and patterning of metallic, dielectric and epitaxial layers developed as separate and multi-purpose modules which could be integrated in full cycle of device fabrication at last stage of the project. Demonstrators of electronic and optoelectronic devices and sensors will be the final result of different materials integration.

Expected results

1. Design, fabrication, development and characterization of SiC MOSFET transistors.
2. Design, fabrication, development and characterization of HEMT AlGaN/GaN transistors on silicon substrate.
3. Design, fabrication, development and characterization of multi-parameter classifier of liquid bio-fuels quality.

[Pro33] **Micro and nano-systems in chemistry and biomedical diagnostic - Task 2A: Capillary microfluidic sensors use in fertility diagnostics** (Mikro i nanosystemy w chemii i diagnostyce biomedycznej MNS-DIAG), EU structural project**,** project leader: Jan Szmidt co-worker: Michał Borecki, February 2009 – September 2012

The aim of 2A task of grant is a construction of sensor that uses new method of optoelectronic diagnostics of woman fertility. The sensor works using optical capillary in which the vaginal fluid is examined. Unlike the classical fiber optic sensors which rely on changes in light propagation inside the fiber as affected by outside conditions, the optical capillary sensors rely on changes of light transmission in capillaries filled with the analyzed liquid, which opens new interesting possibilities for the applications of those sensors, while raising specific issues relating to the construction, materials and technology of those sensors.

The construction and technological aspects of filling and positioning of the sample of the liquid into the capillary, capillary heating and optical signal coupling are under examination. The application aspects of mammals as cow and woman fertility diagnostics will be discussed, in particular sample pre-treatment and stage, reference points setting and signal processing.

[Pro34] **Silicon-based nanstructures and naodevices for long-term nanoelectronics applications - NANOSIL, Network of Excellence within IST 7FP of UE,** (Przyrządy nano- oraz nanostruktury krzemowe dla zastosowań w nanoelektornice przyszłości), Sieć doskonałości w ramach 7-tego Programu Ramowego UE, project leader: Romuald Beck, co-workers: B.Majkusiak, L.Łukasiak, K.Dalbiak, W.Ciemiewski, R.Mroczyński, D.Tomaszewski, J. Gibki, J.Grabowski, G. Głuszko, A. Jakubowski, J. Jasiński, A. Mazurak, S. Szostak, J. Stęszewski, J. Walczak, January 2008 – December 2010

NANOSIL project is devoted to wide range of issues concerning silicon – based nanodevices. The main types of activities in which the Division actively participates within this project are:

- manufacturing of CMOS device based on classical approach, as well as on SOI, multigate or strained (SiGe) platforms, with particular attention to problems of mobility gain, leakeage reduction, … etc.;
- devices based on graphene on silicon;
- characterization of the manufactured test devices and diagnostics of problems that should be solved either by technology or device design modifications;
- modelling of all types of structures under investigation in this project.

[Pro35] **Technology of new generation of hydrogen and hydrogen compounds sensor for over normative conditions applications POIG "DETEH,"** (Opracowanie technologii nowej generacji czujnika wodoru i jego związków do zastosowań w warunkach ponadnormatywnych), EU structural project, project leader: Jan Szmidt, co-workers: J.Kalenik, P.Firek, A.Werbowy, M.Śmietana, July 2009 – June 2014

The main purpose of the project is the study on technology of new generation sensor of hydrogen and his compounds for over normative conditions applications e.g. high temperature, high pressure or aggressive environment. The research aims of the project are connected with carbon nanomaterials technology with Pd nanograins (in sensor active area) and investigations of connection between structure of sensor active layers and their reaction on hydrogen, hydrogen compounds presence.

5. DEGREES AWARDED

5.1. Ph.D. Degrees

[PhD1] Małgorzata Kalisz, **Modification of silicon surface by means of fluorine r.f. plasma and its application for improvement of gate dielectric electrical properties and control of boron profiles in p-n junctions**, Modyfikacja powierzchni krzemu za pomocą fluorowej plazmy w.cz. i jej zastosowanie do poprawy właściwości elektrycznych tlenku bramkowego i kontroli profilu boru w złączach p-n, supervisor: Romuald Beck, 12 Mary 2009

[PhD2] Paweł Wrzosek, **The optoelectronic microsystem for nano-lite sample examintation with optical capillaries use**, Mikrosystem optoelektroniczny do badania próbek o nanolitrowych objętościach z wykorzystaniem kapilar optycznych, supervisor: Jan Szmidt, 3 March 2009

5.2. M.Sc. Degrees

[MSc1] Dominik Brodowski, **Software support for I-V measurement system with the extraction of selected parameters of MOS structures,** Oprogramowanie do sterowania pomiarami I-V i ekstrakcji wybranych parametrów struktur MOS, advisor: Sławomir Szostak, very good

[MSc2] Izabela Burska, **Laboratory exercise in the remote learning system - ideology and implementation,** Ćwiczenia laboratoryjne w systemie nauczania zdalnego - idea i implementacja, advisor: Ryszard Piramidowicz, very good

[MSc3] Łukasz Chudzian, **Adoption of USB bus for gauge application,** Zastosowanie łącza USB w aplikacjach czujnikowych, advisor: Michał Borecki, very good

[MSc4] Magdalena Chudzik, **Thulium doped fibre amplifier for optical telecommunication S-band,** Wzmacniacze światłowodowe domieszkowane jonami tulu na optyczne pasmo telekomunikacyjne S, advisor: Ryszard Piramidowicz, excellent

[MSc5] Bartosz Feliński, **Analysis of parameters of systems with photovoltaic generator with different tilt angle,** Analiza parametrów pracy systemów z generatorem fotowoltaicznym o różnym kącie nachylenia, advisor: Stanisław Pietruszko, very good

[MSc6] Krzysztof Główka, **3D objects shape measurment using structure light,** Pomiar kształtu obiektów trójwymiarowych z wykorzystaniem oświetlenia strukturalnego, advisor: Piotr Garbat, very good

[MSc7] Piotr Górowski, **Motion tracking methods in CCTV,** Metody śledzenia ruchu w systemach monitoringu wizyjnego, advisor: Piotr Garbat, good

[MSc8] Jacek Grądzki, **Implementations of low voltage LNA in 90 nm CMOS technologies (UMC and TSMC) for GPS,** Projekt niskonapięciowego i niskoszumnego wzmacniacza pracującego na częstotliwości systemu GPS w technologii UMC 90 nm, advisor: Witold Pleskacz, excellent

[MSc9] Karol Grzywacz, **Wood grain examination with texture techniques,** Badanie usłojenia drewna technikami opisu tekstur, advisor: Piotr Garbat, excellent

[MSc10] Łukasz Jałowiecki, **Study of electrooptic parameters of IPS liquid crystal cells,** Badanie elektrooptycznych właściwości przetworników ciekłokrystalicznych opartych na efekcie IPS, advisor: Janusz Parka, very good

[MSc11] Aleksander Koter, **Design and analysis of electrostatic discharge ESD protection circuits for UMC CMOS 90 nm technology,** Projekt i analiza zabezpieczeń przeciwko wyładowaniom elektrostatycznym ESD dla technologii UMC CMOS 90 nm, advisor: Witold Pleskacz, very good

[MSc12] Angelika Kowalska, **Effect of automatic parameters of registration on a grey scale reproduction of color images in Video Surveillance CCTV Systems,** Wpływ automatycznych ustawień parametrów rejestracji na reprodukcję kolorów w skali szaroodcieniowej, advisor: Marek Sutkowski, very good

[MSc13] Krystian Król, **Sample and hold circuit in 0,35 um technology,** Projekt układu próbkująco - pamiętającego (Sample and Hold) w technologii 0,35 um, advisor: Elżbieta Piwowarska, excellent

[MSc14] Paweł Kurant, **Aluminum wire bonding between contacts on silicon carbide and contacts on ceramic substrate. Testing usable properties,** Połączenia wykonywane drutem Al między SiC a kontaktami podłoża ceramicznego. Badanie właściwości użytkowych, advisor: Ryszard Kisiel, good

[MSc15] Piotr Lasecki, **Methods of artifacts deletion coming from damage and pollution in digital images,** Metody usuwania detali pochodzących od uszkodzeń i zanieczyszczeń w obrazach zapisanych cyfrowo, advisor: Marek Sutkowski, very good

[MSc16] Krzysztof Marcinek, **Enhanced LEON3 Low Power IP Core for Superscalar Processing and DMS Technologies,** Dwupotokowa, niskomocowa mikroarchitektura procesora LEON3 dla technologii submikrometrowych, advisor: Witold Plaskacz, very good

[MSc17] Mateusz Mroczkowski, **Studies of electroluminescence of thick-film structures,** Badanie elektroluminescencji struktur grubowarstwowych, advisor: Jerzy Kalenik, very good

[MSc18] Paweł Narczyk, **Design and analysis of digital IO cells for UMC CMOS 90 nm technology,** Projekt i analiza cyfrowych komórek wejścia/wyjścia dla technologii UMC CMOS 90nm, advisor: Witold Pleskacz, very good

[MSc19] Michał Nasiłowski, **Broadband wireless access technologies: LTE and HSDPA,** Analiza, charakterystyka i porównanie technik szerokopasmowego, bezprzewodowego dostępu LTE oraz UMTS/HSDPA, advisor: Agnieszka Szymańska, good

[MSc20] Łukasz Ozimkiewicz, **Methods of the nonlinear distortion reduction in the directly modulated optical transmitters,** Metody redukcji zniekształceń nieliniowych w nadajnikach analogowych łączy optycznych z modulacją bezpośrednią, advisor: Jarosław Dawidczyk, very good

[MSc21] Kamil Pazio, **Ion implantation into SiC,** Procesy implantacji jonów do podłoży SiC, advisor: Jan Szmidt, very good

[MSc22] Maciej Lasota, **Design of a floating point processing unit for a MOVE architecture microprocessor and its power consumption optimization,** Projekt jednostki zmiennoprzecinkowej dla procesora o architekturze MOVE - optymalizacja poboru mocy, advisor: Witold Pleskacz, excellent

[MSc23] Mariusz Przybysz, **Excited state absorption in holmium doped material,** Absorpcja ze stanów wzbudzonych w ośrodkach laserowych aktywowanych trójdodatnimi jonami holmu, advisor: Michał Malinowski, good

[MSc24] Przemysław Rogalski, **Reserch of the system for broadcasting messages to customers of digital satellite television based on the standard MPEG-2 and DVB,** Opracowanie systemu do nadawania komunikatów dla odbiorców satelitarnej telewizji cyfrowej opartej na standardzie MPEG-2 i DVB, advisor: Mikołaj Baszun, good

[MSc25] Marcin Rogulski, **Calculation of logic expression describing the truth table using multidimensional spaces widening method,** Wyznaczanie minimalnej postaci wyrażenia logicznego metodą poszerzania wielowymiarowych przestrzeni Karnaugh, advisor: Grzegorz Janczyk, very good

[MSc26] Daniel Rybak, **Text recognition in augmented reality systems,** Rozpoznanie tekstu w systemach rzeczywistości wspomaganej, advisor: Piotr Garbat, good

[MSc27] Anna Sawicka, **Modeling of I-V Characteristics of Double Gate MOSFET,** Modelowanie charakterystyk prądowo-napięciowych dwubramkowego tranzystora MOS, advisor: Lidia Łukasiak, excellent

[MSc28] Maciej Słodczyk, **Intelligent cyclic analog-to-digital converter with automatic process mismatch effects compensation,** Cykliczny przetwornik A/C z automatyczną kompensacją wpływu rozrzutów produkcyjnych, advisor: Zbigniew Jaworski, very good

[MSc29] Michał Sokołowski, **Features of System Verilog language as compared to Verilog HDL,** Właściwości języka System Verilog w porównaniu do Verilog HDL, advisor: Elżbieta Piwowarska, good

[MSc30] Agnieszka Szymczak, **Charakteristics and analysis of transoceanic links,** Charakterystyka i analiza łączy transoceanicznych, advisor: Agnieszka Szymańska, very good

[MSc31] Bartłomiej Łabędzki, **Verification and characterization of selected combinational standard cells for CMOS 90 nm technology,** Weryfikacja i charakteryzacja wybranych kombinacyjnych komórek standardowych w technologii CMOS 90 nm, advisor: Witold Pleskacz, excellent

[MSc32] Maciej Tywończuk, **Design and analysis of method used for estimation of digital CMOS circuits' power consumption during early stage of design process,** Opracowanie i analiza metody szacowania poboru mocy układów na wczesnym etapie projektowania, advisor: Witold Pleskacz, very good

[MSc33] Krzysztof Włodarczyk, **Emission proprieties of active materials Yb3Al5O12-Yb4Al2O9 i Yb2O3 - Yb4Al2O9 doped with Er3+ ions,** Właściwości emisyjne aktywnych eutektyków Yb3Al5O12-Yb4Al2O9 i Yb2O3 - Yb4Al2O9 domieszkowanymi jonami Er3+, advisor: Marcin Kaczkan, good

[MSc34] Kamil Woźniak, **An ultra-broadband microwave power amplifier,** Ultraszerokopasmowy mikrofalowy wzmacniacz mocy, advisor: Jerzy Piotrowski, excellent

[MSc35] Tomasz Wójcik, **Study of flip-chip and mechanical assembly technology between SiC and ceramic substrates – abstract,** Połączenia typu flip-chip oraz mechaniczne między SiC a podłożem ceramicznym. Badanie właściwości użytkowych, advisor: Ryszard Kisiel, good

[MSc36] Paweł Wujek, **Logic state analyzer implemented on FPGA,** Analizator stanów logicznych w oparciu o układy FPGA, advisor: Sławomir Szostak, very good

[MSc37] Cezary Wysocki, **The investigation of solder joint reliability under high current stressing,** Badanie niezawodności połączeń lutowanych pod obciążeniem prądowym, advisor: Ryszard Kisiel, good

[MSc38] Bartłomiej Żmijewski, **12-bit digital to analog converter in 90 nm sub-micron technology,** 12-bitowy przetwornik cyfrowo-analogowy w technologii submikronowej 90 nm, advisor: Elżbieta Piwowarska, very good

5.3. B.Sc. Degrees

[BSc1] Aleksander Bednarz, **Precision comparator for ADC and DAC applications,** Precyzyjny komparator do zastosowań w przetwornikach A/C i C/A, advisor: Dominik Kasprowicz, good

[BSc2] Bryl Mikołaj, **Programming measure enviroment for DefSim_Analog,** Oprogramowanie środowiska pomiarowego układu scalonego DefSim_Analog, advisor: Arkadiusz Łuczyk, very good

[BSc3] Gaweł Gajdzis, **Library for SRAM and ROM memory generator in UMC 90nm (SP) technology,** Projekt biblioteki komórek dla generatora pamięci ROM i SRAM dla technologii UMC 90 nm (SP), advisor: Zbigniew Jaworski, good

[BSc4] Paweł Karczewski, **Simulator of the AVR-family microcontrollers,** Symulator mikrokontrolerów z rodziny AVR, advisor: Sławomir Szostak, good

[BSc5] Kamil Kulma, **Thermal resistance measurement of carborund - substrate structure,** Badanie przewodności cieplnej struktury: węglik krzemu-podłoże, advisor: Ryszard Kisiel, good

[BSc6] Paweł Kurek, **SystemC aided standard digital blocks testing,** Modele standardowych bloków cyfrowych w SystemieC (RAM,BIT,itp.), advisor: Elżbieta Piwowarska, very good

[BSc7] Łukasz Leszczyński, **Implementation of digital complex gates for UMC CMOS 90 nm technology,** Implementacja cyfrowych bramek złożonych w technologii UMC 90 nm, advisor: Arkadiusz Łuczyk, very good

[BSc8] Paweł Łuć, **The internet communicator with voice and video transmission,** Komunikator internetowy z transmisją głosu oraz obrazu, advisor: Piotr Witoński, good

[BSc9] Piotr Narożnik, **Precision operational amplifier in 0.35um CMOS technology,** Precyzyjny wzmacniacz operacyjny w technologii CMOS 0.35um, advisor: Zbigniew Jaworski, good

[BSc10] Sebastian Olszewski, **Software for visualization of the simulation of semiconductor devices,** Oprogramowanie do wizualizacji wyników symulacji przyrządów półprzewodnikowych, advisor: Sławomir Szostak, good

[BSc11] Dariusz Raćkowski, **Library for SRAM and ROM memory generator in UMC 90 (LL) technology,** Biblioteka dla generatora pamięci SRAM i ROM technologii UMC 90 nm (LL), advisor: Zbigniew Jaworski, very good

[BSc12] Szymon Rapacki, **Modelling parameters of multimode optical fibers - application in Java,** Modelowanie parametrów wielomodowych światłowodów włóknowych- aplikacja w języku Java, advisor: Piotr Witoński, good

[BSc13] Łukasz Rusek, **SCORM 1.2 compliant mechanisms implementation in Test Generator application,** Implementacja mechanizmów standardu SCORM 1.2 w aplikacji Generator Testów, advisor: Elżbieta Piwowarska, good

[BSc14] Wojciech Sykurski, **Characteristic, schematic and security valuation of Local Wireless Network,** Charakterystyka, schemat i ocena bezpieczeństwa lokalnej sieci bezprzewodowej, advisor: Agnieszka Szymańska, good

[BSc15] Paweł Szewczyk, **The analysis of the properties of the selected techniques of data classification,** Analiza właściwości wybranych technik klasyfikacji danych, advisor: Mikołaj Baszun, good

[BSc16] Sebastian Tomczyk, **A recording system for measurements of the magnetic field elements in geophysical observatories and field stations,** Układ zbierania danych elementów pola magnetycznego w obserwatoriach geofizycznych i stacjach terenowych, advisor: Jarosław Dawidczyk, very good

[BSc17] Oyunkhand Tsogbayar, **Research of influence of using a different kind of illumination on noise level during digital image registration,** Badanie wpływu zastosowania różnego rodzaju oświetlenia na poziom szumów podczas cyfrowej rejestracji obrazów, advisor: Marek Sutkowski, good

[BSc18] Michał Ufnal, **Implementation of modified discrete cosine transform (MDCT) in technology CMOS 90 nm,** Implementacja dyskretnej zmodyfidowanej transformaty kosinusowej (MDCT) w technologii CMOS 90 nm, advisor: Arkadiusz Łuczyk, good

[BSc19] Jakub Wiśniewski, **Launching and testing an Outdoor Measurement System of photovoltaic modules,** Uruchomienie i testowanie zestawu do pomiarów parametrów modułów fotowoltaicznych, advisor: Stanisław Pietruszko, good

[BSc20] Szymon Wiśniewski, **VHDL models of digital blocks for signals defuzzification in the outputs of fuzzy knowledge based controllers,** Modele VHDL bloków cyfrowych realizujących różne metody wyostrzania sygnałów wyjściowych sterownika rozmytego, advisor: Andrzej Wielgus, good

[BSc21] Damian Wójcicki, **Spektroscopic characterization of Tb3Sc2Al3O12-TbScO3 laser materials with a structure of photonic crystal,** Charakteryzacja spektroskopowa materiałów laserowych TB3Sc2Al3O12-TbScO3 o strukturze kryształu fotonicznego, advisor: Marcin Kaczkan, very good

6. PUBLICATIONS

6.1. Scientific and Technical Papers published in Journals Included in the ISI[1] Database

Number	Journal	Authors	Title	Volume	Pages
[Pub1]	Applied Optics	P.Szczepański, T.Osuch, Z.Jaroszewicz	Modeling of amplification and light generation in one-dimensional photonic crystal using multi-wavelength transfer matrix approach	Vol. 48, No 28	5401-5406
[Pub2]	Applied Physics Letters	S.Glinsek, B.Malic, Z.Kutnjak, H.Wang, J.Krupka, M.Kosec	Dielectric properties of $Kta_{0.6}Nb_{0.4}O_3$ thin films on alumina aubstrates prepared by chemical solution deposition	94	172905-1 – 172905-3
[Pub3]	Applied Physics Letters	J.Breeze, J.Krupka, A.Centeno, N.McN Alford	Temperature-stable and high Q-factor TiO_2 Bragg reflector resonator	94	082906-1 – 082906-3
[Pub4]	Applied Physics Letters	P.Perlin, K. Holc, M.Sarzyński, W.Scheibenzuber, Ł.Marona, R.Czarnecki, M.Leszczyński, M.Bockowski, I.Grzegory, S.Porowski, G.Cywiński, P.Firek, J.Szmidt, U.Schwarz, T.Suski	Application of a composite plasmonic substrate for the suppression of an electromagnetic mode leakage in InGaN laser diodes	95	261108-1 - 3
[Pub5]	Ferroelectrics	M.Popis, J.Krupka, I.Wielgus, M.Zagórska	Measurements of Microwave Conductivity of Conjugated Plymers and Their Blends	388	235 - 239
[Pub6]	IEEE Microwave and Wireless Components Letters	J.Krupka, W.Gwarek	Measurements and Modeling of Planar Metal Film Patterns Deposited on Dielectric Substrates	Vol. 19, No 3	134 - 136
[Pub7]	Journal of Luminescence	R.Piramidowicz, A.Bok, M.Klimczak, M.Malinowski	UV emission properties of Thiulium-doped fluorozirconate glasses	129	1874 - 1877
[Pub8]	Journal of Luminescence	M.Malinowski, M.Kaczkan, S.Stopiński, R.Piramidowicz, A.Majchrowski	Short-wavelenght luminescence in Ho^{3+} - doped $KGd(WO_4)_2$ crystals	129	1505 - 1508
[Pub9]	Journal of Luminescence	M.Klimczak, M.Malinowski, J.Sarnecki, R.Piramidowicz	Luminescence properties in the visible of Dy:YAG/YAG planar waveguides	129	1869 - 1873
[Pub10]	Journal of Physics: Condensed Matter	C.Koepke, K.Wiśniewski, D.Piątkowski, M.Malinowski	Competition between two types of anti-Stokes emission in Ho3+ - activated ZBLAN glass	21	035113 (4pp)
[Pub11]	Journal of Vacuum Science & Technology B	R.Mroczyński, R.Beck	Application of plasma enhanced chemical vapor deposition silicon oxynitride layers in nonvolatile semiconductor memory devices	27 (1)	494 - 497
[Pub12]	Journal of Vacuum Science and Technology B	B.Majkusiak	Analytical modeling of the tunneling probability throughdouble-layer gate stacks	27 (1)	346 - 351
[Pub13]	Materials Science And Engineering B	P.Firek, A.Werbowy, J.Szmidt	MIS field effect transistor with barium titanate thin film as a gate insulator	165	126 - 128
[Pub14]	Measurement Science and Technology	J.Krupka, K.Derzakowski, J.G.Hartnett	Measurements of the complex permittivity and the complex permeability of low and medium loss isotropic and uniaxially anisotropic metamaterials at microwave frequencies	20	1-5
[Pub15]	Microelectronics Reliability	S.Achmatowicz, K.Kiełbasiński, E.Zwierkowska, I.Wyżkiewicz, V.Baltrusaitis, M.Jakubowska	A new photoimageable platinum conductor	49	579 - 584

1 Institute for Scientific Information (Philadelphia, USA)

[Pub16]	Microelectronics Reliability	R.Kisiel, Z.Szczepański	Die-attachment solutions for SiC power devices	49	627 - 629
[Pub17]	Molecular Crystals and Liquid Crystals	M.Sutkowski, T.Grudniewski, W.Piecek, P.Morawiak, J.Parka, E.Nowinowski-Kruszelnicki, Z.Raszewski	Holographic recordings usign bostable SmC* structures	502	195 - 206
[Pub18]	Optical Materials	M.Klimczak, M.Malinowski, R.Piramidowicz	Orange and IR to violet up-conversion processes in Nd:ZBLAN glasses	31	1811 - 1814
[Pub19]	Optical Materials	M.Malinowski, M.Kaczkan, M.Klimczak, R.Piramidowicz	Ultraviolet emission excitation in RE3+ activated fluoride fibers	31	484 - 489
[Pub20]	Opto-Electronics Review	M.Sutkowski, P.Garbat, E.Nowinowski-Kruszelnicki, A.Walczak, J.Parka, J.Woźnicki	Polarization difference image analysis with LC filter	Vol. 16, No 4	53-58
[Pub21]	Physica Status Solidi B	M.Kaczkan, M.Borowska, M.Malinowski, T.Łukasiewicz	Up-conversion mechanisms in Er3+ doped YbAG crystals	Vol. 246, No 7	1677-1685
[Pub22]	Plasma Processes and Plymers	P.Firek, J.Szmidt, K.Nowakowska-Langier, K.Zdunek	Electric characterization and selective etching of aluminium oxide	No 6	5840 - 5843
[Pub23]	Solid-State Electronics	P.Palestri, C.Alexander, A.Asenov, V.Aubry-Fortuna, G.Baccarani, A.Bournel, M.Braccioli, B.Cheng, P.Dollfus, A.Esposito, D.Esseni, C.Fenouillet-Beranger, C.Fegina, G.Fiori, A.Ghetti, G.Iannacone, A.Martinez, B.Majkusiak, S.Monfray, V.Peikert, S.Reggiani, C.Riddet, J.Saint-Martin, E.Sangiorgi, A.Schenk, L.Selmi, P.Toniutti, J.Walczak	A comparison of advanced transport models for the drain current in nanoscale nMOSFETs	53	1293 - 1302

6.2. Scientific and Technical Papers Published in Journals not Included in the ISI Database

Number	Journal	Authors	Title	Volume	Pages
[Pub24]	Biuletyn Informacyjny	J.Woźnicki	Uniwersytety w procesie przemian – którędy do celu?	5 (61)	10 - 14
[Pub25]	ECS Transactions	R.Mroczyński, R.Beck	Silicon Oxynitride Layers Fabricated by Plasma Enhanced Chemical Vapor Deposition (PECVD) for CMOS Devices	25 (8)	797 - 804
[Pub26]	Elektronika	A.Pałatonow, Z.Jaworski, K.Jędzrejewski, Ł.Małkiewicz, J.Jasnos	Projektowanie i analiza laboratoryjnego prototypu cyklicznego przetwornika A/C wykorzystującego nową zasadę konwersji	8/2009	71 - 75
[Pub27]	Elektronika	R.Kisiel, M.Guziewicz	Waściwości elektryczne i mechaniczne metalizacji kontaktowych Ni I Ti oraz wytworzonych na nich połączeń drutowych do n-SiC	6/2009	26 - 31
[Pub28]	Elektronika	A.Taube, M.Sochacki, J.Szmidt	Optymalizacja konstrukcji i modelowanie tranzystora RESURF LJFET w 4H-SiC	6/2009	20 - 25
[Pub29]	Elektronika	N.Kwietniewski, K.Pazio, M.Sochacki, J.Szmidt, A.Droździel, M.Kulik, S.Prucnal, K.Pyszniak, M.Rawski, M.Turek, J.Żuk	Charaktryzacja diod p-i-n wytworzonych mtodą implantacji warstw epitaksjalnych 4H-SiC jonami glinu	6/2009	32 - 35
[Pub30]	Forum Uczelniane	J.Woźnicki	Uniwersyste – konserwatywna innowacja	1/2009	6 - 8

[Pub31]	Journal of Telecommunications and Information Technology	A.Malinowski, D.Tomaszewski, L.Łukasiak, A.Jakubowski, M.Sekine, M.Hori, M.Korwin-Pawłowski	Analysis of the Dispersion of Electrical Parameters and Characteristics of FinFET Devices	4/2009	45 - 50
[Pub32]	Journal of Telecommunications and Information Technology	P.Firek, J.Szmidt	Technology of MISFET with SiO2/BaTiO3 system as a gate instulator	4/2009	61 - 64
[Pub33]	Logistyka	C.Czjdo. M.Baszun	Transition to autonomous mode and remote control in vehicles with incapacitated driver	6/2009	10 pp.
[Pub34]	Logistyka	M.Baszun, M.Główka	Zastosowanie algorytmów mrówkowych w poszukiwaniu optymalnych połączeń	3/2009	8 pp
[Pub35]	Materiały Elektroniczne	Z.Szczepański, R.Kisiel	SiC Die-Substrate Connections for High Temperature Applications	Vol. 37, No1	99 - 106
[Pub36]	Otolaryngologia Polska	W.A.Pleskacz, A.Wałkanis, P.Rapiejko, D.Jurkiewicz	Elektrogustometr uniwersalny EG-1	Vol. 63, No 3	261 - 263
[Pub37]	Otolaryngologia Polska	K.Dżaman, P.Rapiejko, K.Szczygielski, W.Pleskacz, D.Jurkiewicz	Percepcja smaku u chorych z przewlekłym zapaleniem zatok przynosowych z polipami nosa leczonych doustną glikokortykosteroidoterapią	Vol. 63, No 3	236 - 241
[Pub38]	Physics Procedia	M.Kaczkan, D.A.Pawlak, S.Turczyński, M.Malinowski	Emission properties of Tb3Sc2Al3O12-TbScO3 eutectic with self-organized rodlike microstructure	2	391 - 406
[Pub39]	Protetyka Stomatologiczna	K.Zadroga, P.Warda, W.Kamiński, P.Szczyrek	Wpływ grubości i koloru licówek ceramicznych na absorpcję mocy promieniowania lampy polimeryzacyjnej	LIX, No5	349355
[Pub40]	Przyszłość -Świat-Europa-Polska, Biuletyn Komitetu Prognoz "Polska 2000 Plus" przy Prezydium PAN	B.Galwas	Edukacja i kreatyność w erze internetu	1/2009	88 - 95
[Pub41]	Telekomunikacja i Techniki Informacyjne	P.Szczepański	Fotonika w systemach teleinformatycznych nowych generacji	3-4/2009	127 - 141

6.3. Scientific and Technical Papers Published in Conference Proceedings

Number	Conference	Authors	Title	City, Country	Pages
[Pub42]	Computer Methods and Systems CMS'09, November 26-27	A.Malinowski, M.Sekine, M.Hori, D.Tomaszewski, L.Łukasiak, A.Jakubowski	Co-simulation matlab-sentaurus for LWR modeling in double gate field effect transistors	Kraków, Poland	435 - 440
[Pub43]	European Solid-State Circuits Conference – ESSCIRC Fringe, September 14-18	M.Weis, P.Teichmann, T.Seybold, D.Kasprowicz, A.Pfitzner, W.Maly, D.Schmitt-Landsiedel	Adiabatic Circuits using Vertical Slit Field Effect Transistor	Athens, Greece	
[Pub44]	I Polska Konferencja Optyczna, June 27 – July 1	K.Leśniewska-Matys, P.Szczepański	Generacja promieniowania w wielokanałowym laserze sprzężonym fazowo zbudowanym na bazie dwuwymiarowego kryształu fotonicznego	Będlewo, Poland	
[Pub45]	I Polska Konferencja Optyczna, June 27 – July 1	M.Koba, P.Szczepański	Analiza nieliniowej pracy lasera z ośrodkiem aktywnym w postaci kryształu fotonicznego	Będlewo, Poland	1 - 11

[Pub46]	I Polska Konferencja Optyczna, June 27 – July 1	T.Osuch, M.Koba, P.Szczepański	Analiza parametrów generacyjnych lasera z ośrdkiem aktywnym w postaci jednowymiarowego kryształu fotonicznego z defektem	Będlewo, Poland	1 - 8
[Pub47]	IEEE International Conference on Integrated Circuits Design&Technology (ICICDT), May 18-20	M.Weis, A.Pfitzner, D.Kasprowicz, R.Emling, T.Fischer, S.Henzler, W.Maly, S.Schmitt-Landsiedel	Stacked 3-Dimensional 6T SRAM cell with Independent Double Gate Transistors	Austin, Texas USA	169 - 172
[Pub48]	IEEE International Symposium on Circuits Design&Systems (ISCAS), May 24-27	M.Weis, A.Pfitzner, D.Kasprowicz, R.Emling, W.Maly, D.Schmitt-Landsiedel	Adder Circuits with Transistors Using Independently Controlled Gates	Taipei, Taiwan	449 - 452
[Pub49]	IEEE Symposium on Design and Diagnostics of Electronic Circuits and Systems – IEEE DDECS'2009, April 15-17	J.Grądzki, T.Borejko, W.Pleskacz	Low voltage LNA implementations in 90 nm CMOS Technology for multistandard GNSS	Liberec, Czech Republic	78-83
[Pub50]	IEEE Symposium on Design and Diagnostics of Electronic Circuits and Systems – IEEE DDECS'2009, April 15-17	K.Marcinek, A.Łuczyk, A. Pleskacz	Enhanced LEON3 core for superscalar processing	Liberec, Czech Republic	238-241
[Pub51]	IEEE Symposium on Design and Diagnostics of Electronic Circuits and Systems – IEEE DDECS'2009, April 15-17	P.Malik, M.Ufnal, A.Łuczyk, M.Balaz, W.Pleskacz	MDCT/IMDCT low power implementations in 90 nm CMOS Technology for MP3 Audio	Liberec, Czech Republic	144-147
[Pub52]	III Krajowa Konferencja Nanotechnologii NANO'2009, June 22-26	A.Taube, P.Firek, K.Kościewicz, G.Wielgoszewski, J.Szmidt, T.Gotszalk	Wpływ wygrzewania na parametry cienkich warstw tytanianu baru	Warsaw, Poland	179
[Pub53]	III Krajowa Konferencja Nanotechnologii NANO'2009, June 22-26	P.Caban, M.Wesołowski, W.Strupiński, J.Szmidt	Zależność przerwy energetycznej od składu dla AlGaN otrzymywanego w technologii LP MOVPE 0	Warsaw, Poland	111
[Pub54]	III Krajowa Konferencja Nanotechnologii NANO'2009, June 22-26	P.Caban, W.Strupiński, J.Szmidt	Azotek galu na homoepitaksjalnej warstwie SiC aplikacja w strukturze HEMT z nanometrową barierą AlGaN	Warsaw, Poland	112
[Pub55]	III Krajowa Konferencja Nanotechnologii NANO'2009, June 22-26	P.Dominik, W.Adamkiewicz, D.Smoleń, A.Ostrowski, S.Podsiadło, R.Beck, K.Fronc, J.Wróbel, P.Caban, W.Strupiński	Synteza nanodrutów azotku galu metodą SSM na podłożach GaN/Al2O3 oraz GaN/SiC	Warsaw, Poland	118
[Pub56]	IX Konferencja Uniwersytet Wirtualny: model, narzędzia, praktyka, June 17-19	B.Galwas, E.Piwowarska, D.Paluch, T.Radwański	Nowy multimedialny model podręcznika elektronicznego	Warsaw, Poland	1 - 14
[Pub57]	IX Konferencja Uniwersytet Wirtualny: model, narzędzia, praktyka, June 17-19	E.Grzejszczyk, M.Plebanska, E.Piwowarska	Informatyka w przedsiębiorstwie. Pakiet studiów podyplomowych	Warsaw, Poland	1 - 19
[Pub58]	IX Konferencja Uniwersytet Wirtualny: model, narzędzia, praktyka, June 17-19	K.Anders, K.Madziar, M.Jusza, I.Burska, P.Witoński, R.Piramidowicz	Ćwiczenia laboratoryjne w systemie kształcenia zdalnego	Warsaw, Poland	1 - 22
[Pub59]	IX Konferencja Uniwersytet Wirtualny: model, narzędzia, praktyka, June 17-19	K.Madziar, B.Galwas	Laboratorium wirtualne fotoniki mikrofalowej	Warsaw, Poland	1 - 16

[Pub60]	IX Sympozjum Techniki Laserowej STL'2009, September 21-25	A.Jusza, K.Anders, M.Chudzik, J.Marticorena, P.Witoński, R.Piramidowicz	Modelowanie parametrów generacyjnych lasera włóknowego domieszkowanego jonami erbu z rezonatorem DBR	Świnoujście, Poland	1 - 6
[Pub61]	IX Sympozjum Techniki Laserowej STL'2009, September 21-25	A.Mossakowska-Wyszyńska, M.Kaczkan, M.Koba, P.Czuma, D. Pawlak, K.Kołodziejak, S.Turczyński	Analiza właściwości fotonicznych eutektyków Tb3Sc2Al3O12 – TbScO3 o strukturze włóknistej	Świnoujście, Poland	1-4
[Pub62]	IX Sympozjum Techniki Laserowej STL'2009, September 21-25	J.Kęsik, W.Kamiński, M.Osiniak	Impulsowa praca jonowych laserów Ar i Kr w krótkofalowym zakresie promieniowania UV	Świnoujście, Poland	1 - 6
[Pub63]	IX Sympozjum Techniki Laserowej STL'2009, September 21-25	J.Sarnecki, M.Malinowski, K.Kopczyński, M.Kaczkan, R.Piramidowicz, J.Młyńczak, M.Maciejewska	Epitaksjalne warstwy Gd3Ga5O12 zawierające jony Co2+ i Ni2+	Świnoujście, Poland	115-116
[Pub64]	IX Sympozjum Techniki Laserowej STL'2009, September 21-25	K.Anders, M.Chudzik, P.Gdula, J.Marticorena, K.Jędrzejewski, R.Piramidowicz	Erbowy laser włóknowy z rezonatorem DBR w geometrii „all-fiber"	Świnoujście, Poland	1 - 4
[Pub65]	IX Sympozjum Techniki Laserowej STL'2009, September 21-25	K.Leśniewska-Matys, P.Szczepański	Analiza generacji promieniowania laserów planarnych zbudowanych ze sfazowanych falowod fotonicznych	Świnoujście, Poland	1-5
[Pub66]	IX Sympozjum Techniki Laserowej STL'2009, September 21-25	M.Jusza, K.Welikow, R.Piramidowicz	Światłowodowy układ czujnikowy zasilany zdalnie promieniowaniem laserowym	Świnoujście, Poland	1 - 6
[Pub67]	IX Sympozjum Techniki Laserowej STL'2009, September 21-25	M.Kaczkan, K.Kołodziejak, K.Włodarczyk, D.Pawlak, M.Malinowski	Właściwości emisyjne samoorganizujących się eutektyków tlenkowych YbAg:Er	Świnoujście, Poland	1 - 5
[Pub68]	IX Sympozjum Techniki Laserowej STL'2009, September 21-25	M.Koba, P.Szczepański	Teoria wielomodowej pracy lasera z ośrodkiem aktywnym w postaci kryształu fotonicznego o sieci kwadratowej	Świnoujście, Poland	1-6
[Pub69]	IX Sympozjum Techniki Laserowej STL'2009, September 21-25	M.Malinowski, R.Piramidowicz, J.Sarnecki, K.Kopczyński	Zastosowania laserowe epitaksjalnych warstw granatów aktywowanych jonami metali przejściowych	Świnoujście, Poland	44
[Pub70]	IX Sympozjum Techniki Laserowej STL'2009, September 21-25	T.Osuch, M.Koba, P.Szczepański	Model pracy lasera z ośrodkiem aktywnym w postaci kryształu fotonicznego na progu generacji oparty na formaliźmie macierzy przejścia	Świnoujście, Poland	1-6
[Pub71]	IX Sympozjum Techniki Laserowej STL'2009, September 21-25	W.Kamiński, J.Kęsik, P.Warda	Wpływ zawartości argonu na generację kryptonowych linii widmowych jonowego lasera Ar-Kr	Świnoujście, Poland	128 – 129
[Pub72]	MOS-AK/ESSDERC/ESSCIRC Workshop: Frontiers of Compact Modeling, September 18	A.Sawicka, L.Łukasiak, A.Jakubowski, D.Tomaszewski	A new compact model for short-channel symmetirc DG MOSFET	Athens, Greece	P-32, 1 - 3
[Pub73]	The VI International Conference Cyberspace, November 20-21	M.Baszun	Real-time medical advising in cyberspace and its security aspects	Brno, Czech Republic	1-23 CD

[Pub74]	Ultimate Integration on Silicon Conference ULIS 2009, March 18-20	P.Palestri, C.Alexander, A.Asenov, G.Baccarani, A.Bournel, M.Braccioli, B.Cheng, P.Dollfus, A.Esposito, D.Esseni, A.Ghetti, C.Fiegna, G.Fiori, V.Aubry-Fortuna, G.Iannaccone, A.Martinez, B.Majkusiak, S.Monfray, S.Reggiani, C.Riddet, J.Saint-Martin, E.Sangiorgi, A.Schenk, L.Selmi, L.Silvestri, J.Walczak	Comparison of Advanced Transport Models for Nanoscale nMOSFETs	Aachen, Germany	125 - 128
[Pub75]	XI Seminarium: Powierzchnia i Struktury Cienkowarstwowe, May 19-22	L.Łukasiak, A.Jakubowski	O niektórych konsekwencjach pewnego wynalazku, czyli o tranzystorze i prawie Moore'a - referat zaproszony	Szklarska Poręba, Poland	4
[Pub76]	XI Seminarium: Powierzchnia i Struktury Cienkowarstwowe, May 19-22	M.Sochacki, N.Kwietniewski, J.Szmidt, P.Kowalczyk	Reaktywne trawienie jonowe (RIE) węglika krzemu (4H-SiC) w plazmie fluorowej w technologii przyrządów półprzewodnikowych	Szklarska Poręba, Poland	24
[Pub77]	XI Seminarium: Powierzchnia i Struktury Cienkowarstwowe, May 19-22	P. Caban, W.Strupiński, J.Szmidt	Wzrost i charakteryzacja galu na podłożach 6H-SiC	Szklarska Poręba, Poland	42
[Pub78]	XI Seminarium: Powierzchnia i Struktury Cienkowarstwowe, May 19-22	W.Strupiński, J.Borysiuk, K.Kościkiewicz, P.Caban	Węglik Krzemu w technologii CVD	Szklarska Poręba, Poland	75
[Pub79]	XII Konferencja i II Szkoła Światłodwody i ich zastosowania TAL 2009, October 14-17	T.Martynkien, J.Olszewski, G.Statkiewicz-Barabach, W.Urbańczyk, J.Wójcik, P.Mergo, M.Makara, T.Nasiłowski, F.Berghmans, H.Thienpont, R.Piramidowicz, P.Gdula	Interferencyjny pomiar dyspersji chromatycznej we włóknach fotonicznych z podwójnym koncentrycznym rdzeniem	Krasnobród, Poland	
[Pub80]	XVI Konferencja Inżynierii Akustycznej i Biomedycznej, March 30 - April 3	M.Baszun	Zdalna akwizycja i wstępna kwalifikacja danych biomedycznych z monitoringu pacjentów	Zakopane, Poland	
[Pub81]	XXIV IEEE-SPIE Joint Symposium on Photonics, Web Engineering, Electronics for Astronomy and High Energy Physics Experiments, May 25-31	K.Anders, J.Marticorena, M.Chudzik, P.Gdula, K.Jędrzejewski, R.Piramidowicz	Erbium doped fiber laser with DBR resonator	Wilga, Poland	1 - 17
[Pub82]	XXIV IEEE-SPIE Joint Symposium on Photonics, Web Engineering, Electronics for Astronomy and High Energy Physics Experiments, May 25-31	M.Jusza, R.Piramidowicz	Practical aspects of optical powering of active elements in sensing networks	Wilga, Poland	1 - 28
[Pub83]	XXXIII International Conference of IMAPS – CPMT IEEE Poland, September 21-24	A.Stadler, Z.Zawiślak, K.Mleczko, A.Kolek, M.Jakubowska, K.Kiełbasinski, A.Młożniak	Noise properties of thick film resistirs prepared for „green electronics"	Pszczyna, Poland	194 - 197
[Pub84]	XXXIII International Conference of IMAPS – CPMT IEEE Poland, September 21-24	K.Kiełbasiński, A.Młożniak, M.Jakubowska	Vanadium oxide as a devitrification exhibitor in lead-free glass for environmental friendly thick film resistor	Pszczyna, Poland	175 - 178

[Pub85]	XXXIII International Conference of IMAPS – CPMT IEEE Poland, September 21-24	R.Kisiel, M.Guziewicz, A.Piotrowska, J.Szmidt	Ti and Ni Based Ohmic Contacts for Al and Au Wire Bonds in High Power SiC Devices	Pszczyna, Poland	179 - 182
[Pub86]	XXXIII International Conference of IMAPS – CPMT IEEE Poland, September 21-24	Z.Szczepański, R.Kisiel, M.Guziewicz	Flip Chip process realization for SiC structures	Pszczyna, Poland	339 - 342
[Pub87]	8th Symposium Diagnostics and Yield – Advanced Silicon Devices and technolgies for ULSI Era, June 22-24	A.Mazurak, J.Grabowski, R.Beck, B.Majkusiak	Double Barrier MOS Structures with PECVD Amorphous Silicon Layer	Warsaw, Poland	
[Pub88]	8th Symposium Diagnostics and Yield – Advanced Silicon Devices and technolgies for ULSI Era, June 22-24	A.Sawicka, L.Łukasiak, A.Jakubowski	Modeling of I-V characteristics of short-channel DGMOSFET	Warsaw, Poland	
[Pub89]	8th Symposium Diagnostics and Yield – Advanced Silicon Devices and technolgies for ULSI Era, June 22-24	G.Głuszko, P.Firek, L.Łukasiak, J.Szmidt, A.Jakubowski	Charge pumping characterization of MOSFETs with $SiO_2/BaTiO_3$ as a gate stack	Warsaw, Poland	
[Pub90]	8th Symposium Diagnostics and Yield – Advanced Silicon Devices and technolgies for ULSI Era, June 22-24	J.Grabowski, A.Mazurak, T.Płociński, M.Andrzejczuk, K.J.Kurzydłowski, B.Majkusiak, R.Beck	PECVD ultrathin amorphous silicon layer for double barrier structures	Warsaw, Poland	
[Pub91]	8th Symposium Diagnostics and Yield – Advanced Silicon Devices and technolgies for ULSI Era, June 22-24	J.Jasiński, G.Głuszko, L.Łukasiak, A.Jakubowski	Charge characterization of MOSFETs with HfSiON gate dielectric	Warsaw, Poland	
[Pub92]	8th Symposium Diagnostics and Yield – Advanced Silicon Devices and technolgies for ULSI Era, June 22-24	M.Iwanowicz, L.Łukasiak, A.Jakubowski	Vector pulse generator for pulse characterization methods	Warsaw, Poland	
[Pub93]	8th Symposium Diagnostics and Yield – Advanced Silicon Devices and technolgies for ULSI Era, June 22-24	M.Kalisz, R.Beck, G.Głuszko	Novel method of improving electrical properties of thin PECVD oxide films by fluorination of sislicon surface region by RIE in r.f. CF_4 plasma	Warsaw, Poland	
[Pub94]	8th Symposium Diagnostics and Yield – Advanced Silicon Devices and technolgies for ULSI Era, June 22-24	M.Kalisz, R.Beck, G.Głuszko	The effect of high temperature annealing on fluorine distribution profile and electro-physical properties of thin gate oxide fluorinated by silicon dioxide RIE in CF_4 plasma	Warsaw, Poland	
[Pub95]	8th Symposium Diagnostics and Yield – Advanced Silicon Devices and technolgies for ULSI Era, June 22-24	P.Sałek, L.Łukasiak, A.Jakubowski	New threshold voltage for undoped symmetrical DGMOSFET	Warsaw, Poland	
[Pub96]	8th Symposium Diagnostics and Yield – Advanced Silicon Devices and technolgies for ULSI Era, June 22-24	R.Mroczyński, R.Beck	Reliability issues of double gate dielectric stacks based of hafnium dioxi (HfO2) layers for non-volatile semiconductor memory (NVSM) applications	Warsaw, Poland	
[Pub97]	14th Canadian Semiconductor Technology Conference, August 10-14	A Malinowski, D.Tomaszewski, M.Hori, M.Sekine, L.Łukasiak, A.Jakubowski, M.Korwin-Pawłowski	FinFET scaling – analysis of electrical parameters and characteristics	Hamilton, Onatrio, Canada	248

[Pub98]	14th Canadian Semiconductor Technology Conference, August 10-14	J.Jasiński, G.Głuszko, M.Iwanowicz, L.Łukasiak, A.Jakubowski, M.Korwin-Pawłowski	Charge-pumping charecterization of MOSFETs with HfSiON gate dielectric	Hamilton, Onatrio, Canada	250
[Pub99]	14th Canadian Semiconductor Technology Conference, August 10-14	M.Iwanowicz, Z.Pióro, L.Łukasiewicz, A.Jakubowski	Signal generator for extensive characterization of MOS devices	Hamilton, Onatrio, Canada	249
[Pub100]	16th International Conference “Mixdes Design of Integrated Circuits and Systems” MIXDES’2009, June 25-27	A.Jarosz, A.Pfitzner	Evaluation of interconnection capacitances in IC’s with heterogeneous isolating materials	Łódź, Poland	427 – 432
[Pub101]	16th International Conference “Mixdes Design of Integrated Circuits and Systems” MIXDES’2009, June 25-27	A.Pfitzner, M.Staniewski, M.Strzyga	DC Characteristics of Junction Vertical Slit Field-Effect Transistor (JVeFET)	Łódź, Poland	420 - 422
[Pub102]	16th International Conference “Mixdes Design of Integrated Circuits and Systems” MIXDES’2009, June 25-27	D.Tomaszewski, A.Malinowski, M.Zaborowski, P.Sałek, L.Łukasiak, A.Jakubowski	Fluctuations of Electrical Characteristics of FinFET Devices	Łódź, Poland	61 - 66
[Pub103]	16th International Conference “Mixdes Design of Integrated Circuits and Systems” MIXDES’2009, June 25-27	J.Arabas, Ł.Bartnik, S.Szostak, D.Tomaszewski	Global Extraction of MOSFET Parameters Using the EKV Model: Some Properties of the Underlying Optimization Task	Łódź, Poland	67 - 72
[Pub104]	16th International Conference “Mixdes Design of Integrated Circuits and Systems” MIXDES’2009, June 25-27	K.Marcinek, A.Łuczyk, W.Pleskacz	Enhanced LEON3 low power IP core for DSM technologies	Łódź, Poland	262-265
[Pub105]	16th International Conference “Mixdes Design of Integrated Circuits and Systems” MIXDES’2009, June 25-27	R.Kisiel, M.Guziewicz, A.Piotrowska, J.Szmidt	Stability of Al. and Au Wire Bonds to Ti- and Ni-based Ohmic Contacts for High Power SiC Devices	Łódź, Poland	62
[Pub106]	19th International Congress on Photonic in Europe CLEO, June14-19	M.Klimczak, M.Malinowski, R.Piramidowicz	Specific spectral features of green to UV and violet up-conversion in Nd3+ doped fluorozirconate galss	Munich, Germany	CE1.1 MON
[Pub107]	19th International Travelling Summer School on Microwaves and Lightwaves, July 4-10	B.Galwas	RF Photonic Technology	Rome, Italy	1 - 8
[Pub108]	19th International Travelling Summer School on Microwaves and Lightwaves, July 4-10	P.Szczepański	Photonic Crystals – Applications in lasers	Rome, Italy	1 - 51
[Pub109]	32nd International Spring Seminar on Electronics Technology, ISSE’2009, May 13-17	K.Kiełbasiński, M.Jakubowska, A.Młożniak, M.Hrovat, J.Holc, D.Belavic	Electrical and Microstructure Evolution of Thick Film Lead-free Resistors after Various Temperature Treatments	Brno, Czech Republic	106 - 110
[Pub110]	32nd International Spring Seminar on Electronics Technology, ISSE’2009, May 13-17	P.Firek, J.Szmidt, A.Werbowy	Characterization of Barium Titanate Thin Films Deposited by Means of Plasma Sputtering	Brno, Czech Republic	92 - 93

[Pub111]	32nd International Spring Seminar on Electronics Technology, ISSE'2009, May 13-17	R.Kisiel, M.Guziewicz, A.Piotrowska, E.Kamińska, K.Gołaszewska, N.Kwietniewski, W.Paszkowicz, R.Ratajczak, K.Pagowska, A.Stonert	Stability of Gold Bonding and Ti/Au Ohmic Contact Metallization to n-SiC in High Power Devices	Brno, Czech Republic	144-145
[Pub112]	45th Int. Conference on Microelectronics, Devices and Materials, MIDEM'2009, September 9-11	J.Krupka	Measurements of Materials at Microwave Frequencies	Postojna, Slovenia	3 - 9
[Pub113]	45th Int. Conference on Microelectronics, Devices and Materials, MIDEM'2009, September 9-11	K.Kiełbasiński, M.Jakubowska, A.Młożniak, M.Hrovat, J.Holc, D.Belavic	Lead-free „Green" thick-film resistors: some results on the development of characteristics during firing	Postojna, Slovenia	1 - 6
[Pub114]	45th Int. Conference on Microelectronics, Devices and Materials, MIDEM'2009, September 9-11	P.Firek, J.Szmidt, A.Werbowy	Characterization of Barium Titanate Thin Films Deposited by Means of Plasma Sputtering	Postojna, Slovenia	92 - 93
[Pub115]	45th Int. Conference on Microelectronics, Devices and Materials, MIDEM'2009, September 9-11	S.Glinsek, B.Malic, Z.Kutnjak, Hong Wang, J.Krupka, M.Kosec	Radio and Microwave Frequency Range Dielectric Properties of $K(Ta, Nb)O_3$ Thin Films	Postojna, Slovenia	203-205
[Pub116]	216th Meeting of Electrochemical Society, October 4-9	R.Mroczyński, R.Beck	Silicon oxynitride layers fabricated by Plasma Enhanced Chemical Vapor Deposition for CMOS device	Vienna, Austria	Vol.25(8), 797-804

6.4. Scientific and Technical Books

Number	Authors	Publisher	Title, volume, pages
[Pub117]	B.Czejdo, M.Baszun	Springer-Verlag Berlin Heidelberg	Visioning and Enginering the Knowledge Society: An interactive medical Knowledge Assistant, pp. 298 - 304
[Pub118]	B.Galwas	Warszawska Drukarnia Naukowa PAN	Rola nauki w myśleniu o przyszłości: Szczególna rola technologii w przejściu do ery Internetu, pp. 141 - 155
[Pub119]	P.Garbat, E.Nowinowski-Kruszelnicki, M.Sutkowski, L.Puzio, A.Walczak	Academy Publishing House EXIT	Image Processing & Communications Challenges: Edge detection in Polarized Images, pp. 97 - 106
[Pub120]	T.Grudniewski, M.Sutkowski, R.Lichograj, P.Matusiak, J.Parka, E.Nowinowski-Kruszelnicki	Wydawnictwo PSW im. Papieża Jana Pawła II w Białej Podlaskiej	Technologie informacyjne w zastosowaniach: Efekty pamięciowe w przetwornikach ciekłokrystalicznych pod wpływem wiązek zapisujących o małej mocy, pp. 26 - 29
[Pub121]	R.Kisiel	Oficyna Wydawnicza – Prace Naukowe Politechniki Warszawskiej	Połączenia lutowane w montażu elektronicznym z zastosowaniem materiałów ekologicznych, z. 170, p. 166
[Pub122]	J.Krupka, A.Miękinia, R.Morawski, L.Opalski	OficynaWydawnicza Politechniki Warszawskiej	Wstęp do metod numerycznych dla studentów elektroniki i technik Informacyjnych, p. 300
[Pub123]	W.Pleskacz	Oficyna Wydawnicza – Prace Naukowe Politechniki Warszawskiej	Analiza topografii układów scalonych VLSI pod kątem ich produkowalności, z. 172, p. 117
[Pub124]	J.Woźnicki	Oficyna Wydawnicza ASPRA-JR, Warszawa	Andrzej Bartnicki Pierwszy Rektor Pułtuskiej Almae Matris 1994-2004: Wspomnienie o Rektorze, pp. 239 - 245
[Pub125]	J.Woźnicki	UNESCO-CEPES	The University as an Institution of Public Domain: The Polish Perspective, p. 435

7. PATENTS

[Pat1] M.Borecki, M.Korwin-Pawłowski, J.Szmidt, M.Bebłowska, A.Jakubowski, H. Zamojski, **Optical capillary for measurement with photonic structure,** (Optyczna kapilara pomiarowa ze strukturą fotoniczną), Zgłoszenie patentowe nr Z-388909, złożone w Urzędzie Patentowym RP 2009

[Pat2] M.Borecki, M.Korwin-Pawłowski, J.Szmidt, M.Bebłowska, A.Jakubowski, M.Szmid, **Measurement head with optical capillary,** (Głowica pomiarowa z kapilarą optyczną), Zgłoszenie patentowe nr Z-388910, złożone w Urzędzie Patentowym RP 28.08.2009

[Pat3] J.Kalenik, M.Śmietana, **Waveguide sensor head** (Głowica czujnika światłowodowego), Patent PL 204205 B1, 22.07.2009

[Pat4] P.Wrzosek, J.Szmidt, M.Borecki, M.Bebłowska, **Measurement head with optical capillary for selected liquid parameters examination**, (Głowica pomiarowa z kapilarą optyczną do badania wybranych parametrów cieczy), Zgłoszenie patentowe nr Z-385936, złożone w Urzędzie Patentowym RP 2009

8. REPORTS

[Rep1] **A photonic construction for sensors and electronic material examination,** (Charakteryzacja konstrukcji i materiałów dla techniki sensorowej), project leader: Jan Szmidt

[Rep2] **Contact and assembly technologies for high temperature, high power and high frequency applications of SiC devices**, (Technologia kontaktów i montażu dla przyrządów z węglika krzemu do zastosowań wysokotempearturowych, wysokomocowych i wysokoczęstotliwościowych), project leader: Ryszard Kisiel

[Rep3] **Deposition and measurements of thin metal and dielectric films intended for nanoelectronics and microwave technique,** (Wytwarzanie i charakteryzacja cienkich warstw metalicznych i dielektrycznych dla potrzeb nanoelektroniki i techniki mikrofalowej), project leader: Jerzy Krupka

[Rep4] **Design methodology for RF integrated circuits,** (Metodologia projektowania układów scalonych RF), project leader: Wiesław Kuźmicz

[Rep5] **Electrical characterization of dielectric-semiconductor interface in advanced MOS structures,** (Elektryczna charakteryzacja powierzchni granicznej dielektryk-półprzewodnik w zaawansowanych strukturach MOS), project leader: Lidia Łukasiak

[Rep6] **Electronic detectors and chemical sensitive devices with diamond and diamon-like carbon (dlc) films, (**Elektroniczne detektory i przyrządy chemoczułe z warstwami diamentowymi i diamentopodobnymi**)**, project leader: Jan Szmidt

[Rep7] **Emission properties of the active oxide materials with periodic structure,** (Właściwości emisyjne aktywnych materiałów tlenkowych o periodycznym uporządkowaniu), project leader: Marcin Kaczkan

[Rep8] **Ferroelectric smectic LC materials in holographic recordings,** (Ciekłokrystaliczne smektyczne materiały o właściwościach ferroelektrycznych do zapisów holograficznych), project leader: Janusz Parka

[Rep9] **Hierarchical structures of 3D shape description applied to merging procedures of spatially uncorrelated fragments of 3D images,** (Wykorzystanie hierarchicznych struktur opisu kształtu powierzchni 3D w łączeniu nieskorelowanych przestrzennie fragmentów obrazów trójwymiarowych), project leader: Piotr Garbat

[Rep10] **IC design skills for advanced DSM technologies, European Commission 7 Framework Programme – Project IDESA (contract No. 215180)**, Projekt 7 Programu Ramowego UE, project leader: Wiesław Kuźmicz

[Rep11] **Investigations of microwave devices containing liquid crystals,** (Badania własności mikrofalowych elementów zawierających ciekłe kryształy), project leader: Bogdan Galwas

[Rep12] **Modeling and characterization of multigate MOS SOI structures** (Modelowanie i charakteryzacja wielobramkowych struktur MOS SOI), project leader: Andrzej Jakubowski

[Rep13] **Modeling and characterization of semiconductor devices fabricated on silicon carbide cubic (3C-SiC) and hexagonal (4H-SiC) polytype substrates,** (Modelowanie i charakteryzacja przyrządów półprzewodnikowych wytworzonych na kubicznej (3C-SiC0 oraz heksagonalnej (4H-SiC) odmianie węglika krzemu), project leader: Andrzej Jakubowski

[Rep14] **Modeling and investigation of lasing and amplifying micro-structures and characterization of the optically active materials,** (Modelowanie, opracowanie i badanie mikro-struktur wzmacniających i laserowych oraz charakteryzacja materiałów optycznie aktywnych), project leader: Michał Malinowski

[Rep15] **Modeling of silicon structures with low-dimensional electron gas, (**Modelowanie struktur krzemowych z niskowymiarowym gazem elektronowym**),** project leader: Jakub Walczak

[Rep16] **Modification of silicon surface by implanted from r.f. plasma fluorine ions,** (Modyfikacja powierzchni krzemu za pomocą jonów fluoru wprowadzanych z obszaru plazmy w.cz.), project leader: Romuald Beck

[Rep17] **Network of Excellence for Micro-Optics – NEMO, Network of Excellence within 2nd IST 6FP of UE** (Mikronowe i sub-mikronowe przyrządy dla fotoniki - NEMO), Sieć doskonałości w ramach 6-tego Programu Ramowego UE, project responsible person in IMiO: Paweł Szczepański

[Rep18] **Next generation teleinformatics service and nets – technology, application and market aspects. Development of technology and algorithms for telemedicine services using of Internet and cell telephone nets,** (Usługi i sieci teleinformatyczne następnej generacji – aspekty techniczne, aplikacyjne i rynkowe. Rozwój technik i algorytmów telemedycyny z wykorzystaniem Internetu oraz sieci telefonii komórkowej), project leader: Mikołaj Baszun

[Rep19] **Optoelectronic mikrosystem to make research of samples about nano-liters volumes with using the optical capillaries,** (Mikrosystem optoelektroniczny do badania próbek o nanolitrowych objętościach z wykorzystaniem kapilar optycznych), project leader: Jan Szmidt

[Rep20] **Process of spontaneous emission in photonic crystals,** (Proces emisji spontanicznej w kryształach fotonicznych), project leader: Paweł Szczepański

[Rep21] **Silicon-based nanstructures and naodevices for long-term nanoelectronics applications - NANOSIL, Network of Excellence within IST 7FP of UE,** (Przyrządy nano- oraz nanostruktury krzemowe dla zastosowań w nanoelektornice przyszłości), Sieć doskonałości w ramach 7-tego Programu Ramowego UE, project leader: Romuald Beck

[Rep22] **The Electron Cold Emission from Carbon layers (technology and characterization),** (Warstwy węglowe na potrzeby zimnej emisji elektronów (technologia i charakteryzacja)), project leader: Jan Szmidt

[Rep23] **Thin barium titanate layers for microelectronics demand – technology, characterization and applications,** (Warstwy tytanianu baru na potrzeby mikroelektroniki- technologia,charakteryzacja i próby aplikacji), project leader: Jan Szmidt

[Rep24] **Unipolar devices and transistors for high-temperature electronics,** (Przyrządy unipolarne I struktury tranzystorowe na potrzeby elektroniki wysokotemperaturowej), project leader: Jan Szmidt

[Rep25] **Vertical Slit Devices for Integrated Circuits,** (Technologia elementów z pionową szczeliną dla układów scalonych), project leader: Wiesław Kuźmicz

9. CONFERENCES, SEMINARS AND MEETINGS

9.1. International Conferences

[Con1] **Computer Methods and Systems CMS'09**, Kraków, Poland, November 26-27
participants: A.Jakubowski, L.Łukasiak, D.Tomaszewski

[Con2] **European Solid-State Circuits Conference – ESSCIRC Fringe,** Athens, Greece, September 14-18
participants: D.Kasprowicz, A.Pfitzner

[Con3] **IEEE International Conference on Integrated Circuits Design&Technology (**ICICDT**),** Austin, Texas USA May 18-20
participants: D.Kasprowicz, A.Pfitzner

[Con4] **IEEE International Symposium on Circuits Design&Systems (ISCAS),** Taipei, Taiwan May 24-27
participants: D.Kasprowicz, A.Pfitzner

[Con5] **IEEE Symposium on Design and Diagnostics of Electronic Circuits and Systems – IEEE DDECS'2009,** Liberec, Czech Republic, April 15-17
participants: T.Borejko, J.Grądzki, A.Łuczyk, K.Marcinek, W.Pleskacz

[Con6] **MOS-AK/ESSDERC/ESSCIRC Workshop: Frontiers of Compact Modeling,** Athens, Greece, September 18
participants: A.Jakubowski, L.Łukasiak

[Con7] **The VI International Conference Cyberspace,** Brno, Czech Republic, November 20-21
participant: M.Baszun

[Con8] **Ultimate Integration on Silicon Conference ULIS 2009,** Aachen, Germany March 18-20
participants: B.Majkusiak, J.Walczak

[Con9] **XXIV IEEE-SPIE Joint Symposium on Photonics, Web Engineering, Electronics for Astronomy and High Energy Physics Experiments,** Wilga, Poland, May 25-31
participants: K.Anders, M.Chudzik, P.Gdula, M.Jusza, R.Piramidowicz

[Con10] **XXXIII International Conference of IMAPS – CPMT IEEE Poland,** Pszczyna, Poland, September 21-24
participants: K.Kiełbasinski, R.Kisiel, J.Szmidt, Z.Szczepański

[Con11] **8th Symposium Diagnostics and Yield – Advanced Silicon Devices and technolgies for ULSI Era,** Warsaw, Poland, June 22-24
participants: R.Beck, P.Firek, G.Głuszko, M.Iwanowicz, A.Jakubowski, J.Jasiński, M.Kalisz, L.Łukasiak, B.Majkusiak, A.Mazurak, R.Mroczyński, P.Sałek, J.Szmidt

[Con12] **14th Canadian Semiconductor Technology Conference,** Hamilton, Onatrio, Canada, August 10-14
participants: G.Głuszko, M.Iwanowicz, A.Jakubowski, J.Jasiński, L.Łukasiak, A Malinowski, Z.Pióro, D.Tomaszewski

[Con13] **16th International Conference "Mixdes Design of Integrated Circuits and Systems" MIXDES'2009,** Łódź, Poland, June 25-27
participants: A.Jakubowski, A.Jarosz, A.Łuczyk, L.Łukasiak, R.Kisiel, A.Malinowski, A.Pfitzner, W.Pleskacz, S.Szostak, D.Tomaszewski, J.Szmidt

[Con14] **19th International Congress on Photonic in Europe CLEO,** Munich, Germany, June14-19
participants: M.Klimczak, M.Malinowski, R.Piramidowicz

[Con15] **32nd International Spring Seminar on Electronics Technology, ISSE'2009,** Brno, Czech Republic, May 13-17
participants: P.Firek, K.Kiełbasiński, R.Kisiel, N.Kwietniewski, J.Szmidt, A.Werbowy

[Con16] **45th Int. Conference on Microelectronics, Devices and Materials, MIDEM'2009,** Postojna, Slovenia, September 9-11
participants: P.Firek, K.Kiełbasiński, J.Krupka, J.Szmidt, A.Werbowy

9.2. Local Conferences

[Con17] **I Polska Konferencja Optyczna,** Będlewo, Poland, June 27 – July 1
participants: M.Koba, K.Leśniewska-Matys, P.Szczepański

[Con18] **III Krajowa Konferencja Nanotechnologii NANO'2009,** Warsaw, Poland, June 22-26
participants: W.Adamkiewicz, R.Beck, P.Caban, P.Dominik, P.Firek, K.Fronc, T.Gotszalk, K.Kościewicz, A.Ostrowski, S.Podsiadło, D.Smoleń, W.Strupiński, J.Szmidt, A.Taube, G.Wielgoszewski, M.Wesołowski, J.Wróbel

[Con19] **IX Konferencja Uniwersytet Wirtualny: model, narzędzia, praktyka,** Warsaw, Poland, June 17-19
participants: K.Anders, I.Burska, B.Galwas, M.Jusza, K.Madziar, D.Paluch, R.Piramidowicz, E.Piwowarska, T.Radwański, P.Witoński

[Con20] **IX Sympozjum Techniki Laserowej STL'2009,** Świnoujście, Poland, September 21-25
participants: K.Anders, M.Chudzik, P.Gdula, A.Jusza, M.Kaczkan, W.Kamiński, M.Koba, K.Leśniewska-Matys, M.Malinowski, R.Piramidowicz, P.Witoński

[Con21] **XII Konferencja i II Szkoła Światłodwody i ich zastosowania TAL 2009,** Krasnobród, Poland, October 14-17
participants: P.Gdula, R.Piramidowicz

[Con22] **XVI Konferencja Inżynierii Akustycznej i Biomedycznej,** Zakopane, Poland, March 30 - April 3
participant: M.Baszun

9.3. Schools, Seminars and Meetings

[Con23] **Gdańsk University of Technology Conference (Perspektywy Rozwoju e-Uczelni w Kontekście Globalnej Informatyzacji):** Absorpcja narzędzi i metod e-edukacji we współczesnym uniwersytecie technicznym, Gdańsk, Poland May 14
participant: B.Galwas

[Con24] **Polish Academy of Sciences Seminar:** Edukacja i kreatywność w erze Internetu, Warsaw, Poland, March 16
participant: B.Galwas

[Con25] **WUT Seminar (Postępy edukacji internetowej):** Egzaminowanie przez Internet – założenia i realizacja systemu teleinformatycznego INSPEKTON, Warsaw, Poland, November 26
participant: B.Galwas

[Con26] **II Scholl Optical Fibres and Their Applications:** Interferencyjny pomiar dyspersji chromatycznej we włóknach fotonicznych z podwójnym koncentrycznym rdzeniem, Krasnobród, Poland, October 15
participants: P.Gdula, R.Piramidowicz

[Con27] **XI Seminarium: Powierzchnia i Struktury Cienkowarstwowe,** Szklarska Poręba, Poland, May 19-22
participants: J.Borysiuk, P. Caban, A.Jakubowski, K.Kościkiewicz, N.Kwietniewski, L.Łukasiak, P.Kowalczyk, M.Sochacki, W.Strupiński, J.Szmidt

[Con28] **19th International Travelling Summer School on Microwaves and Lightwaves,** Rome, Italy, July 4-10
participants: B.Galwas, P.Szczepański

[Con29] **216th Meeting of Electrochemical Society,** Vienna, Austria, October 4-9
participants: R.Beck, R.Mroczyński

10. AWARDS

[Award1] Ryszard Biaduń, **President's of the Republic of Poland Gold Medal for Long-Term Service** (Medal Złoty za Długoletnią Służbę nadany przez Prezydenta Rzeczypospolitej Polskiej)

[Award2] Andrzej Jakubowski, Lidia Łukasiak, Sławomir Szostak, Grzegorz Głuszko, **WUT Rector's Collective Award for Scientific Achievements,** (Nagroda Zespołowa I stopnia JM Rektora PW za osiagniecia naukowe w dziedzinie charakteryzacji nowych generacji struktur półprzewodnikowych - w szczególności przyrządów MOS SOI)

[Award3] Zbigniew Szczepański, **Medal of National Education Commission** (Medal Komisji Edukacji Narodowej)

[Award4] Jan Szmidt, **DIPLOMA which certifying that during the GENIUS – EUROPE International Inventions Fair out 324 items from 20 countries "Optical Fiber Sensors Nano – coated with Diamond – like Carbon" was awarded the prestigious GENIUS CUP**, Budapest, Hungary, September 12

[Award5] Jan Szmidt, **The Certificate in recognition of participation in the „Al. Bassel Fair For Invention and Innovation" Organized by the: Ministry of Economy and Trade in cooperation with League of Arab States & Association of Syrian Inventors**, Damascus, July 20

[Award6] Jan Szmidt,**WUT Rector's Individual Award for Organizing Achievements in Academic Year 2008/2009** (Nagroda Indywidualna II stopnia JM Rektora PW za osiągnięcia organizacyjne w roku akademickim 2008/2009)

[Award7] Jan Szmidt, Piotr Firek, **Best Paper Award for „Technology of MISFET with SiO_2BaTiO_3 system as a gate". 8th Symposium Diagnostics and Yield,** Warsaw, June 24

[Award8] Jan Szmidt, Elżbieta Staryga, Riwana Torz-Piotrowska, Andrzej Wrzyszczyński, Kazimierz Paprocki, **Ministry of Science and Higher Education Diploma for „Diamond Electrodes Produced by HF CVD Method for Electrochemical Applications"** (Dyplom Ministra Nauki i Szkolnictwa Wyższego za „Diamentowe elektrody wytwarzane metodą HF CVD dla elektrochemicznych zastosowań")

[Award9] Krystyna Szylko, **President's of the Republic of Poland Gold Medal for Long-Term Service** (Medal Złoty za Długoletnią Służbę nadany przez Prezydenta Rzeczypospolitej Polskiej)

[Award10] Mateusz Śmietana, **IFIA awards on 14th Al Bassel Fair – Damascus, IFIA Scientific Medal for invention represented high scientific result**: Optical fiber sensors nano coated with diamond like carbon

[Award11] Jakub Walczak, Bogdan Majkusiak, **WUT Rector's Collective Award for Scientific Achievements,** (Nagroda Zespołowa JM Rektora PW za osiagniecia naukowe w zakresie modelowania zjawisk transportu w strukturach typu MOS (metal-tlenek-półprzewodnik) o mezoskopowych rozmiarach)