WARSAW UNIVERSITY OF TECHNOLOGY
Faculty of Electronics and Information Technology

Institute of Microelectronics and Optoelectronics

annual report 2015

WARSAW UNIVERSITY OF TECHNOLOGY
Faculty of Electronics and Information Technology

Institute of Microelectronics and Optoelectronics

annual report 2015

Edited by Agnieszka Mossakowska-Wyszyńska
DTP: Hanna Sater

INSTITUTE OFFICES:

Research Affairs
Building of Radio Engineering – GR room 239
ul. Koszykowa 75, 00-662 Warsaw, Poland
phone/fax: +48 22 234 6063, phone: +48 22 234 7777

Teaching Affairs
Building of Electronics – GE room 159
ul. Nowowiejska 15/19, 00-665 Warsaw, Poland
phone/fax: +48 22 234 3652, phone: +48 22 234 5349

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

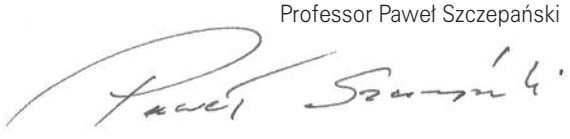
From the Director

This Annual Report summarizes the activities of the Institute of Microelectronics and Optoelectronics (IMiO) in the year 2015, with particular attention given to its research and educational potential. The Institute is a part of the Faculty of Electronics and Information Technology, the biggest faculty of the Warsaw University of Technology. Among six institutes constituting the Faculty, Institute of Microelectronics and Optoelectronics is the one most focused on advanced technologies of modern electronics and photonics.

It should be noted that the Institute has its roots deep in history. Although formally founded in 1970, it evolved from the Chair of Radio Engineering established in 1929 by Professor Janusz Groszkowski, who is often called "the father of Polish electronics". The Institute is linked with the beginnings of the Faculty of Electronics and Information Technology not only by the person of Prof. Groszkowski, who worked in IMiO until end of his career, but also by location – half of the Institute is situated in the Building of Radio Engineering at the Warsaw University of Technology main campus, where the Faculty started its operation in 1951 (as the Faculty of Communications). Currently, the Institute's Technology Centre is located there. It includes laboratories specializing in silicon processing (clean-room), hybrid technologies and assembly techniques, fibre optic and integrated optoelectronics, laser optoelectronics and characterization of new electronic and photonic materials. All 11 high-tech laboratories in the field of electronic and photonic technologies established as a result of the investments conducted within the Innovative Economy Operational Programm framework have reached their full operational capacity and are extensively used to conduct advanced research and provide research services. The labs have improves significantly IMiO's research potential.
The present research activities of the Institute are concentrated in the area of microelectronics, nanoelectronics and photonics. These include in particular VLSI systems, microelectronic and nanoelectronic semiconductor devices, hybrid circuits (e.g. microwave, optoelectronic), sensors, microsystems, lasers, fiber optics and integrated photonics, electronic imaging and image processing. It is worth to emphasize that research activities of the Institute include modelling, CAD, manufacturing and versatile characterization. In the field of teaching, the Institute meets the challenges posed by the development of modern technology and information society. The educational offer (at all levels – B.Sc., M.Sc. and Ph.D.) reflects the main fields of the advanced electronics and photonics and, simultaneously, the main research expertise of the Institute. In the last year, the Institute continued to improve its contribution to the on-campus study program carried out together with the Institute of Electronic Systems in the field of Electronics and Computer Engineering. Since 2012, IMiO also provides a Microelectronics, Photonics and Nanotechnology M.Sc. teaching program. The Institute's involvement in distance learning studies of Electronics and Telecommunications is also worth mentioning, especially postgraduate studies in the domain of tools and techniques of virtual education that began in 2004. Since 2009 IMiO provides a teaching program for the students of the Faculty of Management with the aim of educating future managers in electronic equipment production. IMiO also inspired and was actively involved in the organization of a series of popular science lectures aiming at encouraging secondary-school students to continue their education at our Faculty. Several student laboratories in the area of electronics, microelectronics and photonics and located in the recently expanded wings of the Faculty building have reached their full operational capacity improving considerably the quality of the education offered by IMiO.

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 creative development of the Institute.

Professor Paweł Szczepański



CONTENTS

1. GENERAL INFORMATION 6

1.1. Board of Directors 6
1.2. Organisation of the Institute and Areas of its Activities 7
1.3. Microelectronics and Nanoelectronics Devices Division 8
1.4. VLSI Engineering and Design Automation Division 9
1.5. Image and Microwave Photonics Division 10
1.6. Electronic Materials and Microsystem Technology Division 11
1.7. Optoelectronics Division 12
1.8. Statistical Data 13

2. STAFF 15

2.1. Senior Academic Staff 15
2.2. Junior Research Staff 24
2.3. Science Research Staff 27
2.4. Technical and Administrative Staff 27

3. TEACHING ACTIVITIES 29

3.1. Basic Courses 29
3.2. Advanced Courses 30
3.3. Courses in English 31
3.4. Courses for other Faculties 31
3.5. Courses in English for other Faculties 31

4. RESEARCH PROJECTS 33

4.1. Projects Granted by the University 33
4.2. Projects Granted by the Ministry of Science and Higher education 37
4.3. Projects Granted by National Centre for Research and Development 38
4.4. Projects Granted by the National Science Centre 42
4.5. Projects Granted by International Institutions 46

CONTENTS

5. DISSEMINATION OF KNOWLEDGE 47

5.1. Students Scientific Associations ... 47
5.1.1. Students Scientific Association of Microelectronic and Nanoelectronics (KNMiN) ... 47
5.1.2. Student Scientific Association of Optoelectronics (KNO) ... 48
5.1.3. Students Scientific Association of Microsystems (ONYKS) ... 49
5.1.4. Student Scientific Association of Integrated Systems ... 50
5.2. Cooperation with schools ... 50
5.3. Fiber-Optic Photonics Platform (FOPP) ... 51
5.4. Photovoltaic Platform, Warsaw University of Technology (PVP) ... 52

6. DEGREES AWARDED 55

6.1. Ph.D. Degrees ... 55
6.2. M.Sc. Degrees ... 55
6.3. B.Sc. Degrees ... 56

7. PUBLICATIONS 59

7.1. Scientific and Technical Papers published in Journals Included in the ISI Database ... 59
7.2. Scientific and Technical Papers Published in Journals not Included in the ISI Database ... 61
7.3. Scientific and Technical Papers Published in Conference Proceedings ... 62
7.4. Scientific and Technical Books ... 66

8. PATENTS 67

9. REPORTS 69

10. CONFERENCES, SEMINARS AND MEETINGS 75

10.1. Conferences ... 75
10.2. Schools, Seminars and Meetings ... 76

11. AWARDS 76

1. GENERAL INFORMATION

1.1. Board of Directors

Director of the Institute

Paweł Szczepański, Ph.D., D.Sc. Tenured Professor
GR, room 239,
phone: +48 22 2347533
+48 22 2346066
phone/fax: +48 22 2346063
e-mail: p.szczepanski@imio.pw.edu.pl

Deputy-Director for Research Affairs

Ryszard Piramidowicz, Ph.D., D.Sc. Professor
GR, room 240,
phone: +48 22 2346067
+48 22 2347888
phone/fax: +48 22 2346063
e-mail: r.piramidowicz@imio.pw.edu.pl

Deputy-Director for Teaching Affairs

Lidia Łukasiak, Ph.D., D.Sc. Professor
GE, room 159,
phone: +48 22 2345349
+48 22 2347147
phone/fax: +48 22 2343652
e-mail:l.lukasiak@imio.pw.edu.pl

GR | Building of Radio Engineering – ul. Koszykowa 75
GE | Building of Electronics – ul. Nowowiejska 15/19
GG | WUT Main Building – Pl. Politechniki 1

1.2. Organisation of the Institute and Areas of its Activities

The Institute of Microelectronics and Opto-electronics 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 UE Framework Programme.
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.

1.3. Microelectronics and Nanoelectronics Devices Division

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 microcontrollers.

Head of the Division

Romuald B. Beck, Ph.D., D.Sc. Tenured Professor
GR, room 336,
phone: +48 22 2347534,
fax: +48 22 2346065
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
Andrzej Mazurak, Ph.D.	Assistant Professor
Robert Mroczyński, Ph.D.	Assistant Professor
Sławomir Szostak, Ph.D.	Assistant Professor
Jakub Walczak, Ph.D.	Assistant Professor
Jan Gibki, Ph.D.	Senior Lecturer
Agnieszka Zaręba, Ph.D.	Senior Lecturer

Junior academic staff

Jakub Jasiński, M.Sc.	Assistant
Kamil Ber, M.Sc.	Ph.D. Student
Dominik Tanous, M.Sc.	Ph.D. Student
Piotr Wiśniewski, M.Sc.	Ph.D. Student

Technical and administrative staff

Witold Ciemiewski
Kazimierz Dalbiak
Krzysztof Krogulski

To name a few examples of its research topics:

- 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 (modeling of devices behaviour and modeling 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, SiOxNy);
- 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;
- Silicon photonic devices fabrication.

GR | Building of Radio Engineering – ul. Koszykowa 75
GE | Building of Electronics – ul. Nowowiejska 15/19
GG | WUT Main Building – Pl. Politechniki 1

1.4. VLSI Engineering and Design Automation Division

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, investigations of new devices and circuits for future generations of microelectronic systems.

Head of the Division

Andrzej Pfitzner, Ph.D., D.Sc. Professor
GE, room 355,
phone: +48 22 2347207
fax: +48 22 2343654
e-mail:apf@imio.pw.edu.pl

Senior academic staff

Wiesław Kuźmicz, Ph.D., D.Sc.	Tenured Professor
Witold Pleskacz, Ph.D., D.Sc.	Professor
Elżbieta Piwowarska, Ph.D.	Docent
Tomasz Borejko, Ph.D.	Assistant Professor
Grzegorz Janczyk, Ph.D.	Assistant Professor
Zbigniew Jaworski, Ph.D.	Assistant Professor
Dominik Kasprowicz, Ph.D.	Assistant Professor
Arkadiusz Łuczyk, Ph.D.	Assistant Professor
Marek Niewiński, Ph.D.	Assistant Professor
Andrzej Wielgus, Ph.D.	Assistant Professor
Adam Wojtasik, Ph.D.	Assistant Professor

Junior academic staff

Igor Butryn, M.Sc.	Ph.D. Student
Marek Ciepłucha, M.Sc.	Ph.D. Student
Mariusz Derlecki, M.Sc.	Ph.D. Student
Andrzej Grodzicki, M.Sc.	Ph.D. Student
Jakub Kopański, M.Sc.	Ph.D. Student
Aleksander Koter, M.Sc.	Ph.D. Student
Michał Łukaszewicz, M.Sc.	Ph.D. Student
Krzysztof Marcinek, M.Sc.	Science Assistant, Ph.D. Student
Piotr Mierzwiński, M.Sc.	Ph.D. Student
Krzysztof Siwiec, M.Sc.	Science Assistant, Ph.D. Student
Michał Staniewski, M.Sc.	Ph.D. Student
Łukasz Wiechowski, M.Sc.	Ph.D. Student
Michał Wołodźko, M.Sc.	Ph.D. Student

Technical and administrative staff

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

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,
- development of CAD tools for integrated circuit design and verification, with special emphasis on analog full custom ASICs design,
- design of digital, analog and mixed signal VLSI circuits for special applications such as innovative AD converters, data processing in physical experiments and medical equipment, RF front ends for wireless data transmission etc.,
- modeling and control of leakage currents in nanometer digital circuits,
- investigations and development of new VESTIC microelectronics technology.

GR | Building of Radio Engineering – ul. Koszykowa 75
GE | Building of Electronics – ul. Nowowiejska 15/19
GG | WUT Main Building – Pl. Politechniki 1

1.5. Image and Microwave Photonics Division

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.

Head of the Division

Jerzy Woźnicki, Ph.D., D.Sc. Tenured Professor
GE, room 156,
phone: +48 22 2347780,
fax: +48 22 2345419
e-mail: J.Woznicki@imio.pw.edu.pl

Senior academic staff

Janusz Parka, Ph.D., D.Sc.	Tenured Professor
Piotr Garbat, Ph.D.	Assistant Professor
Jerzy Piotrowski, Ph.D.	Assistant Professor
Marek Sutkowski, Ph.D.	Assistant Professor
Piotr Witoński, Ph.D.	Assistant Professor
Agnieszka Szymańska, Ph.D.	Senior Lecturer

Junior academic staff

Grzegorz Kurzejamski, M.Sc.	Ph.D. Student
Krzysztof Madziar, Ph.D.	Assistant
Jacek Zawistowski, M.Sc.	Ph.D. Student

Technical and administrative staff

Jerzy Domański, M.Sc.
Bożena Janus

Members of the academic staff are involved in research and development works on:

- theoretical principles of image modeling, 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 modeling of optical-microwave frequency conversion processes;
- modeling of optically controlled microwave devices, as photodiodes, photovaractors, phototransistors;
- modeling of optoelectronic and microwave devices for data transmission networks.

GR | Building of Radio Engineering – ul. Koszykowa 75
GE | Building of Electronics – ul. Nowowiejska 15/19
GG | WUT Main Building – Pl. Politechniki 1

1.6. Electronic Materials and Microsystem Technology Division

The research activity of the Division concentrates on optoelectronics (e.g., measuring systems using fiber optic sensors), and hybrid technologies, and the development of wide bandgap semiconductor technology in the design, modeling and manufacturing of microelectronic devices operating at high temperatures, including power semiconductor devices. Fundamental and applied research are carried out. Research groups are organised for defined tasks.

Head of the Division

Jan Szmidt, Ph.D., D.Sc. Tenured Professor
GE, room 115, GR, room 338, GG, room 104,
phone: +48 22 2347200, +48 22 2347776
fax: +48 22 2347204
e-mail: J.Szmidt@elka.pw.edu.pl

Senior academic staff

Jerzy Krupka, Ph.D., D.Sc.	Tenured Professor
Michał Borecki, Ph.D., D.Sc.	Professor
Ryszard Kisiel, Ph.D., D.Sc.	Professor
Mateusz Śmietana, Ph.D.	Professor
Mikołaj Baszun, Ph.D.	Assistant Professor
Piotr Firek, Ph.D.	Assistant Professor
Jerzy Kalenik, Ph.D.	Assistant Professor
Aleksander Werbowy, Ph.D.	Assistant Professor

Junior academic staff

Tymoteusz Ciuk, M.Sc.	Ph.D. Student
Magdalena Dominik (Szymańska), M.Sc.	Ph.D. Student
Anna Katarzyna Dębowska, B.Sc.	Ph.D. Student
Jakub Grochowski, M.Sc.	Ph.D. Student
Maciej Kamiński, M.Sc.	Ph.D. Student
Piotr Knyps, M.Sc.	Ph.D. Student
Krzysztof Krogulski, M.Sc.	Ph.D. Student
Krystian Król, M.Sc.	Ph.D. Student
Norbert Kwietniewski, M.Sc	Science Assistant
Mateusz Mroczkowski, M.Sc.	Science Assistant, Ph.D. Student
Michał Myśliwiec, M.Sc.	Ph.D. Student
Bartłomiej Stonio, M.Sc.	Ph.D. Student
Andrzej Taube, M.Sc.	Ph.D. Student
Michał Waśkiewicz, M.Sc	Science Assistant, Ph.D. Student

Science research staff

Mariusz Sochacki, Ph.D. Assistant Professor

Technical and administrative staff

Ryszard Biaduń,
Katarzyna Trzaskowska.

The main research areas are as follows:

- the use of graphene in the design of photodetectors for the far-infrared range with the electrical and optical characterization of graphene produced on different substrates, or a transferred onto the substrate;
- the design, modeling and fabrication of microelectronic devices based on silicon carbide (SiC) technology;
- the development of electrical characterization methods for the determination of energy distribution of traps in MOS devices;
- designing, modeling and fabrication of microelectronic and optoelectronic devices using transparent dielectric and conductive oxides Fabrication, and characterization of high-k dielectric layers;
- 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 Surface Mount Technologies SMT on 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.);
- Design, fabrication and characterization of multi-junction photovoltaic cells with high energy efficiency;
- design and monitoring of photovoltaic systems, strategy for development of photovoltaics;
- 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.

GR | Building of Radio Engineering – ul. Koszykowa 75
GE | Building of Electronics – ul. Nowowiejska 15/19
GG | WUT Main Building – Pl. Politechniki 1

1.7. Optoelectronics Division

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, new optical waveguide materials and structures, laser spectroscopy, laser construction and laser applications in medicine and air pollution monitoring.
Photovoltaics laboratory, as a part of the Division, serves as a focal point for conducting and stimulating research and demonstration activities, educating students, organizing technical meetings, workshops, symposia and conferences, disseminating information and addressing environmental issues.

Head of the Division

Michał Malinowski, Ph.D., D.Sc. Tenured Professor
GR, room 123,
phone/fax: +48 22 2347783
e-mail:M.Malinowski@elka.pw.edu.pl

Senior academic staff

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

Junior academic staff

Krzysztof Anders, M.Sc.	Research Assistant Lecturer, Ph.D. Student
Bartosz Fetliński, M.Sc.	Ph.D. Student
Aleksandra Golba, M.Sc.	Ph.D. Student
Anna Jusza, M.Sc.	Research Assistant Lecturer, Ph.D. Student
Łukasz Ostrowski, M.Sc.	Ph.D. Student
Mateusz Słowikowski, M.Sc.	Ph.D. Student
Tadeusz Tenderenda, M.Sc.	Ph.D. Student

Science research staff

Andrzej Kaźmierczak, Ph.D.	Research Assistant Professor
Marcin Koba, Ph.D.	Research Assistant Professor

Technical and administrative staff

Maciej Juźwik, M.Sc.

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;
- 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;
- spectroscopic and theoretical research of light generation in silicon photonic lasers.

GR | Building of Radio Engineering – ul. Koszykowa 75
GE | Building of Electronics – ul. Nowowiejska 15/19
GG | WUT Main Building – Pl. Politechniki 1

1.8. Statistical Data

SPECIFICATION	2014	2015	DIFFERENCE
Academic staff	**82**	**83**	**+1**
Tenured professors	9	10	+1
Professors	8	7	-1
Docent	1	1	0
Assistant professors	27	26	-1
Senior lecturers	2	3	+1
Assistants and Ph.D. students	35	36	+1
Science research staff	**7**	**12**	**+5**
Technical and Administrative staff	**23**	**18**	**-5**
Teaching activities	**72**	**81**	**+9**
Basic courses	36	38	+2
Advanced courses	19	22	+3
Special courses	17	21	+4
Research projects	**40**	**42**	**+2**
Granted by the University	7	15	+8
Granted by State Institutions	28	26	-2
Granted by International Institutions	3	1	-2
Others projects	2	0	-2
Degrees awarded	**49**	**54**	**+5**
D.Sc. degrees	1	0	-1
Ph.D. degrees	2	6	+4
M.Sc. degrees	18	20	+2
B.Sc. degrees	28	28	0
Publications	**112**	**94**	**-18**
Sci.-tech. books	5	8	+3
Sci.-tech. papers in journals	47	39	-8
Sci.-tech. papers in conference proceedings	60	47	-13
Patents	**3**	**2**	**-1**
Reports	**65**	**94**	**+29**
Conferences	**54**	**41**	**-13**
Awards	**6**	**15**	**+9**

Microelectronics and Nanoelectronics Devices Division

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, Member of Polish Acoustics Association ('01), WUT Rector's Collective Award ('06), President's of the Republic of Poland Gold Medal for Long-Term Service ('08).

room # 363 GE
phone: +48 22 2347906
fax: +48 22 2346063
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–'08), Member od Programme Committee of: Diagnostics & Yield Conference ('88-), Member of the Faculty Council ('96–), Co-chairman ('03–), Chairman ('06); Member of Programme Committee of ELTE ('84, '04, '07, '13), Member of Technical Programme Committee ESSDERC ('05–'13), Senior Member of IEEE ('97–'06), Head of CEZAMAT Project Office ('08–'12), Vice-President for Scientific Affairs of CEZAMAT PW Ltd ('12–)., WUT Rector's Collective Award for Scientific Achievements ('06,'08,'12).

room # 336 GR
phone: +48 22 2346065
+48 22 2347534
fax: +48 22 2346065
e-mail: r.beck@imio.pw.edu.pl

Michał Borecki, M.Sc. ('91), Ph.D. ('96), D.Sc. ('11), Electronics, Optoelectronics, Sensor Devices, Assistant Professor, full time, Electronic Materials and Microsystem Technology Division, Member of Scientific Committee of Sensordevices Conference ('12-), 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–), Member of Photonics Society of Poland ('08–), Member of the Faculty Council ('11–).

room # 537 GR
phone: +48 22 2347749
fax: +48 22 2346063
e-mail: borecki@imio.pw.edu.pl

Tomasz Borejko, M.Sc. ('03) with distinction, Ph.D. ('13) with distinction, Microelectronics and VLSI Design, Assistant Professor, full time, VLSI Engineering and Design Automation Division, Member of the "DDECS" Programme Committee (IEEE Symposium on Design and Diagnostics of Electronic Circuits and Systems) ('12–).

room # 365 GE
phone: +48 22 2347207
fax: +48 22 2343654
e-mail: T.Borejko@imio.pw.edu.pl

Piotr Firek, M.Sc. ('04), Ph.D. ('10), Microelectronics, Electron Technology, Thin Films, Sensors, Assistant Professor, full time, Electronic Materials and Microsystem Technology Division, WUT Rector's Collective Award for Scientific Achievements ('08,'09,'11), WUT Rector's Individual Award for Scientific Achievements in ('11), Conference Diagnostics & Yield Award with distinction ('09), VII Science Conference ELTE Award with distinction of ('10), Member of IMAPS Poland Chapter ('11–) and PTTS – Polish Society of Sensor Technology ('12–).

room # 423C GR
phone: +48 22 2347932
fax: +48 22 2347932
e-mail: P.Firek@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 and Microwave Photonics Division, Member of SPIE ('01–), Member of Polish Liquid Crystal Society ('09–).

room # 150 GE
phone: +48 22 2347780
fax: +48 22 2346063
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 22 2347535
fax: +48 22 2346065
e-mail: gibki@imio.pw.edu.pl

Grzegorz Janczyk, M.Sc. ('99) with distinction, Ph.D. ('05), VLSI Engineering and Automation Division, Assistant Professor, full time, IEEE member ('00–), Member of the "DDECS" Local Organizing Committee (IEEE Symposium on Design and Diagnostics of Electronic Circuits and Systems) ('14–).

room # 353 GE
phone: +48 22 2347207
fax: +48 22 2343654
e-mail: janczyk@imio.pw.edu.pl

STAFF

Zbigniew Jaworski, M.Sc. ('90), Ph.D. ('97), Microelectronics, Assistant Professor, full time, VLSI Engineering and Design Automation Division, Minister's of Education and Science Team Prize ('06).

room # 354 GE
phone: +48 22 2347207
fax: +48 22 2343654
e-mail: jaworski@imio.pw.edu.pl

Marcin Kaczkan, M.Sc. ('98), Ph.D. ('04) with distinction, Optoelectronic, Laser technology, Spectroscopy of solid state laser materials, Assistant Professor, full time, Optoelectronics Division, WUT Rector's Collective Award for Scientific Achievements ('08,'10,'12).

room # 127 GR
phone: +48 22 2345047
fax: +48 22 2346063
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 Representative for Students Apprenticeship ('91–), Member of Section on Electron Technology and Electronic Materials Technology of the Electronics and Telecommunication Committee of the Polish Academy of Sciences ('93–), WUT Rector's Collective Award for Organizing Achievements ('08).

room # 423A GR
phone: +48 22 2347779
fax: +48 22 2346063
e-mail: kalenik@imio.pw.edu.pl

Dominik Kasprowicz,M.Sc. ('01), Ph.D. with distinction ('06), Microelectronics, Assistant Professor ('07), semiconductor device modeling, full time, VLSI Engineering and Automation Division, WUT Rector's Individual Award for his dissertation thesis ('07), Member of IEEE Society ('12–14), Organizing Committee Chair of DDECS 2014 (IEEE Symposium on Design and Diagnostics of Electronic Circuits and Systems) ('13–14), Program Committee Member of DDESC ('14–)

room # 353 GE
phone: +48 22 2347207
fax: +48 22 2343654
e-mail: dkasprow@imio.pw.edu.pl

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

room # 125A GR
phone: +48 22 2347145
fax: +48 22 2346063
e-mail: kesik@imio.pw.edu.pl

Ryszard Kisiel, M.Sc. ('74), Ph.D. ('83), Electron Technology, D.Sc. ('10), microelectronics: packaging of high temperature devices, assembly techniques, lead-free technology Electronic Materials and Microsystem Technology Division, Professor, full time Member of IMAPS Poland Chapter ('87–), Member of Scientific Committee of IMAPS-Poland Chapter ('00–), Member of IEEE CPMT Society ('00–), President of IEEE CPMT Polish Chapter ('10–), Member of the Electron Technology and Electronic Materials Section of The Polish Academy of Sciences ('07–), Member of the Faculty Council ('10–), WUT Rector's Collective Award for Organizing Achievements ('08), WUT Rector's Individual Award for Scientific Achievements (1st stage) ('11), WUT Rector's Collective Award for Scientific Achievements (1st stage) ('11).

room # 425 GR
phone: +48 22 2347852
fax: +48 22 2346063
e-mail: kisiel@imio.pw.edu.pl
e-mail: rkisiel@elka.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), WUT Rector's Individual Award for Scientific Achievements (1st stage) ('00), 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, WUT Rector's Collective Award for Educational Achievements (1st stage) ('10), Fellow of IEEE ('12).

room # 364 GE
phone: +48 22 2347693
fax: +48 22 2343652
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–), Head of VLSI Engineering and Design Automation Division ('00–'11), Member of Societas Scientiarum Varsoviensis ('02–), Member of the Civic Educational Association (Społeczne Towarzystwo Oświatowe) ('89–), Medal of National Education Commission ('03), The Minister of Education and Science Team Prize ('06).

room # 355 GE
phone: +48 22 2347207
+48 22 2347146
fax: +48 22 2343654
e-mail: wbk@imio.pw.edu.pl

Arkadiusz Łuczyk, M.Sc. ('08), Ph.D. ('15), Microelectronics and VLSI Design, Assistant Professor, full time, VLSI Engineering and Design Automation Division

room # 370 GE
phone: +48 22 2347207
fax: +48 22 2343654
e-mail: alu@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 "Diagnostics and Yield" ('00–), Member of Programme Comm. IEEE ICCDS ('02), Member of the Faculty Council ('02–), Programme Chairman of "Diagnostics and Yield" ('03, '06, '09), Deputy-Director for Teaching Affairs of the Institute of Microelectronics and Optoelectronics ('04–), Member of Technical Programme Committee ESSDERC ('05–'12), co-Editor of "Electron Technology" ('92–'95), WUT Rector's Collective Award for Scientific Achievements ('06, '08, '09), Member of the Connect Advisory Forum for ICT Research and Innovation (CAF) European Commission ('12–'14), WUT Rector's Collective Award for Organizing Achievements ('14).

room # 368 GE
phone: +48 22 2347147
+48 22 2345349
+48 22 2343652
fax: +48 22 2343652
e-mail: lukasiak@imio.pw.edu.pl

Bogdan Majkusiak, M.Sc. ('79), Ph.D. ('85), D.Sc. ('91), Prof. ('03), Microelectronics & Nanoelectronics, Professor, full time, Microelectronics and Nanoelectronics Devices Division, Scientific Secretary of the Microelectronics Section of the Electronics Telecommunication Committee PAN ('89–'96) and Member (89–), Member of the Faculty Council ('92–), Associate Dean for Academic Affairs ('96–'99) and Senior Associate Dean ('99–'02) of the Faculty of Electronics and Information Technology WUT, Member of the Technical Program Committee of the Conference Insulating Films on Semiconductor INFOS('05,'07,'09,'11), Member of Program Committee of the Conference Diagnostic and Yield ('84–), Member of Editorial Council of Electron Technology ('02–), Member of Nanotechnology Conference Program Committee ('07) and International Workshop on Computational Electronics IWCE ('10), Expert of Acreditation Committee of Technical Universities ('01–), Expert of Polish Acreditation Committee ('03–), Member of Scientific Council of Institute of Electron Technology ('03–'07), WUT Rector's Individual Award for Scientific Achievements ('08), WUT Rector's Collective Award for Scientific Achievements ('09,'12), WUT Rector's Collective Award for Organizing Achievements ('14).

room # 233 GR
phone: +48 22 2347773
+48 22 2346065
fax: +48 22 2346065
e-mail: majkusiak@imio.pw.edu.pl

Michał Malinowski, M.Sc. ('79), Ph.D. ('85), D.Sc. ('90), Electronic, Optoelectronic, Tenured 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,'10,'12), Member of Polish Society for Crystal Growth ('02–), Head of Ph.D. Studies ('12–), Member of National Science Centre Committee ('12–).

room # 123 GR
phone: +48 22 2347783
fax: +48 22 2347783
e-mail:
M.Malinowski@elka.pw.edu.pl

Andrzej Mazurak, M.Sc. ('06), Ph.D. ('11) with distinction, Microelectronics, Assistant Professor, full time, Microelectronics and Nanoelectronics Devices Division, WUT Rector's Individual Award for Scientific Achievements (3rd stage) ('12). WUT Rector's Collective Award for Organizing Achievements ('14).

room # 232B GR
phone: +48 22 2346065
fax: +48 22 2346065
e-mail: a.mazurak@imio.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), 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–'12), Member of the Dean's Commission for Faculty Organization ('08–'12), Member of Photonics Society of Poland ('08–), Head of Teaching Group in Optoelectronics Division ('10–), Member of Organizing Committee of ELTE ('04, '13).

room # 119 GR
phone: +48 22 2347246
fax: +48 22 2346063
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, D&Y'06 and Vacuum Technique '11, Dekaban Foundation Scholarship ('11–'12), Scholarship of Advanced Studies Centre of WUT ('08–'09 and '11–'12), Winner of the competition "Knowledge with passion. We promote young scientists." organized by Innovation Transfer of Knowledge in Science Portal and Bolesław Markowski Higher School of Commerce in Kielce ('12), Participant of Science Infrastructure Management Support (SIMS) program supported by National Centre for Research and Development ('14), WUT Rector's Individual Award for Scientific Achievements (1st stage) ('14), WUT Rector's Collective Award for Organizing Achievements ('14), Member of Organizing Committee of Diagnostics & Yield Symposium ('06, '09), Member of Advisory Board of Dekaban Foundation at Warsaw University of Technology ('12–), Vice-Chairman of International Conference on Insulating Films on Semiconductor – INFOS 2013, Expert of the National Centre for Research and Development ('13–).

room # 232B GR
phone: +48 22 2346065
fax: +48 22 2346063
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 # 357 GE
phone: +48 22 2347207
fax: +48 22 2343654
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, full time, Image and Microwave Photonics Division, Member of International Society for Optical Engineering, Polish Chapter, Member of International Board of Optics of Liquid Crystals ('03–'08), Member of Polish Liquid Crystal Society ('09–).

room # 157 GE
phone: +48 22 2343655
+48 22 2347780
fax: +48 22 2345419
e-mail: J.Parka@imio.pw.edu.pl

Andrzej Pfitzner, M.Sc. ('74), Ph.D. ('78), D.Sc. ('99), Microelectronics: physics of semiconductors, device modeling, integrated circuits design for manufacturability; Professor, full time, VLSI Engineering and Design Automation Division; Member of the „MIXDES" International Science Committee ('94–) (Mixed Design of Integrated Circuits and Systems), member of the Science Committee of the Conference "Electron Technology" ('99–'08, '13–), Member of the Microelectronics Section of the Committee for Electronics and Telecommunication of the Polish Academy of Sciences ('99–), member of the NSZZ "Solidarność" University Commission ('10–) and Domestic Section for Science ('14–), Member of the Civic Educational Association STO ('90–); Member of the Faculty Council ('81–'85 & '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), WUT Rector's Individual Award for Scientific Achievements (1st stage) ('00),

room # 360 GE
phone: +48 22 2347207
fax: +48 22 2343654
e-mail: apf@imio.pw.edu.pl

Member of the Senate Financials Commission ('02–'05), Chairman of the Faculty Council Educations Commission ('05–'08), Faculty Plenipotentiary for Quality of Education and member of the University Council for Education Quality ('07–), Disciplinary Officer of the Warsaw University of Technology for Academic Staff ('12–'14), Head of VLSI Engineering and Design Automation Division ('12–).

Jerzy K. Piotrowski, M.Sc. ('75), Ph.D. ('88) with distinction, Microwave and Lightwave Techniques, Assistant Professor, full time, Image and Microwave Photonics Division, Head of Teaching Group in Image and Microwave Photonics Division ('89–), Member of IEEE ('89–), Reviewer for the European Microwave Conference ('04–), Chairman of the IEEE AP/AES/MTT Joint Chapter (Poland Section) ('01–'02; '10–'12), WUT Rector's Individual Award for Scientific Achievements (1st stage) ('01), Visiting Professor at the Technische Universität Hamburg-Harburg ('02–'04), Member of the Faculty Council ('05–'08).

room # 52 GE
phone: +48 22 2345394
fax: +48 22 2343653
e-mail: piotrowski@imio.pw.edu.pl

Ryszard Piramidowicz, M.Sc. ('94), Ph.D. ('00) with distinction, D.Sc. ('13), specialization: optoelectronics – optical spectroscopy, laser technique, fiber-optic elements and systems, integrated photonics, photovoltaics; Associate Professor (full time) in Optoelectronics Division, Deputy-Director for Research of the Institute of Microelectronics and Optoelectronics ('08–), member of the Faculty Council ('08–), coordinator of Photovoltaic Platform of WUT ('14–), coordinator of Fiber-Optic Photonic Platform ('14–), member of Association of Polish Electrical Engineers SEP ('96-) and Photonics Society of Poland ('12–), member of IEEE ('05–), OSA ('06–) and SPIE ('13–), WUT's representative in Technical Committee no. 282 of Polish Committee for Standardization ('98–), expert of National Science Centre ('12–), WUT Rector's Individual Award for Scientific Achievements ('00, '13), WUT Rector's Collective Award for Scientific Achievements ('00, '08, '10, '12).

room # 240 GR
phone: +48 22 2347888
+48 22 2346067
fax: +48 22 2346063
e-mail:
r.piramidowicz@imio.pw.edu.pl

Elżbieta Piwowarska, M.Sc. ('83), Ph.D. ('95) with distinction, 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 Centre for Distance Learning at WUT ('06–).

room # 359 GE
phone: +48 22 2347207
+48 22 2347819
fax: +48 22 2343654
e-mail: e.piwowarska@imio.pw.edu.pl

Witold Pleskacz, Witold Pleskacz, M.Sc. ('83), Ph.D. ('95) with distinction, D.Sc. ('11), Microelectronics (VLSI design, CAD, DFM), Professor, full time, VLSI Engineering and Design Automation Division, Member of the Faculty Council ('99–'02 & '11–), Institute representative for cooperation with high schools ('08–), Medal of National Education Commission ('13), WUT Rector's Individual Awards for Scientific Achievements ('89, '96, '12), Ministry of National Education Award for Teaching Achievements ('93), "Golden Chalk" – Student Council of the Faculty Teaching Awards ('00, '08, '12), "Golden Chalk" – Student Council of the Warsaw University of Technology Teaching Award ('12), Ministry of Science and Higher Education Award for Education Achievements ('06), WUT Rector's Awards for Educational Achievements (Collective '10, Individual '13), Member of IEEE ('13–), 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 Symposium on Design and Diagnostics of Electronic Circuits and Systems) ('04–), Member of the

room # 359 GE
phone: +48 22 2347207
fax: +48 22 2343654
e-mail: pleskacz@imio.pw.edu.pl

"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–'07), Member of the "ADEPT" International Programme Committee (International Conference on Advances in Electronic and Photonic Technologies) ('13–), Polish National Committee URSI – International Union of Radio Science ('11–), Member of the "MIXDES" International Programme Committee (International Conference: "Mixed Design of Integrated Circuits and Systems") ('14–), Member of IEEE DDECS Steering Committee ('14 –).

room # 359 GE
phone: +48 22 2347207
fax: +48 22 2343654
e-mail: pleskacz@imio.pw.edu.pl

Tomasz Skotnicki, M.Sc. (79), Ph.D. ('85), D.Sc. ('92), Microelectronics: physics of semiconductors, device modeling, advanced microelectronic technologies; Tenured Professor, full time, Microelectronics and Nanoelectronics Devices Division, Director of Consortium CEZAMAT ('13–).

room #339 GR
phone: +48 22 2347534
fax: +48 22 2346063
e-mail: t.skotnicki@imio.pw.edu.pl

Mariusz Sochacki, M.Sc.('02), Ph.D. ('07), Wide bandgap materials technology, Silicon carbide and gallium nitride power devices, Science Assistant Professor, full time, Electronic Materials and Microsystem Technology Division

room #423C GR
phone: +48 22 2347932
fax: +48 22 2346063
e-mail: msochack@elka.pw.edu.pl

Stanisław Stopiński, M.Sc. ('08), Ph.D. ('14), Optoelectronics: photonic integrated circuits, fiber optic elements and systems, full time, Optoelectronics Division, Assistant Professor

room # 127A GR
phone: +48 22 2345047
fax: +48 22 234
e-mail: S.Stopinski@imio.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 and Microwave Photonics Division, 3rd stage prize on V Sympozjum Naukowe TPO2006, Member of Polish Liquid Crystal Society ('10–), Leader of Scientific Club of Imaging ('11–).

room #147 GE
phone: +48 22 2347780
fax: +48 22 2345419
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), Director 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–).

rooms: # 239 GR
121 GR
phone: +48 22 2345870
+48 22 2347533
+48 22 2346066
fax: +48 22 2346063
e-mail:
p.szczepanski@imio.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

rooms: # 115 GE
338 GR
104 GG
phone: +48 22 2347220
+48 22 2347776
+48 22 2347200

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–'12), 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 ('08), Genius Medal from Association of Hungarian Inventors on International Invention & Innovation Show IWIS-2008 ('08), The Certificate for 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 ('09), the IFIA Scientific Medal of the International Federation of Inventors Associations for Excellent Invention Deemed to Represent Significant Scientific Value on the 14 Al Bassel Fair – Damascus 2009 ('09), Diploma for "Optical Fiber Sensors Nano – coated with Diamond – like Carbon" Budapest, Hungary ('09), Special Award "For the special involvement and significant support to the development of the Science & Technology Days Poland-East Forum idea" 3rd Forum Science & Technology Days POLAND – EAST. Białowieża ('10), BADGE: Merited for Lodz University of Technology, ('10), Special Award ITMED 2010 "For the special involvement and significant support to the development of the ITMED Forum idea" 4 International Forum Inovative Technologies for Medicine ITMED, Białystok ('10), WUT Rector's Collective Award for Scientific Achievements „Development of a new multiparameter method for grading the liquid and the design and technology for micro-liquid sensors for applications in-situ" ('10), Gold Medal granted by Polish Success Academy for outstanding scientific and teaching achievements, Special Award "For the special involvement and significant support to the development of the Science & Technology Days Poland – East Forum idea" 5th International Forum Science & Technology Days POLAND – EAST, Białowieża, ('11), WUT Rector's Collective Award for scientific achievements during the years of 2009–2010 for the activities in the field of design, modeling, fabrication and characterization of semiconductor devices based on silicon carbide ('11), WUT Rector's Individual Award for Organizing Achievements ('11,'12), Member of the Scientific Council of the Institute of High Pressure Physics PAN ('11–'14), First Award in prof. Mieczysław Pożaryski Competition, Association of Polish Electrical Engineers SEP, for best article "The design and modeling of vertical transistors in silicon carbide DIMOSEFT" ('12), Rector of WUT ('12–).

fax: +48 22 2347204
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), WUT Rector's Collective Award for Scientific Achievements (1st stage) ('09), WUT Rector's Collective Award for Educational Achievements (1st stage) ('10).

room # 275 GE
phone: +48 22 2347535
fax: +48 22 2346063
e-mail: szostak@imio.pw.edu.pl

Agnieszka Szymańska, M.Sc. ('97), Ph.D. ('02), Microwave Electronics, Optoelectronics, Senior Lecturer, full time, Image and Microwave Photonics Division, Member of SPIE ('97–), Member of Photonics Society of Poland ('08–).

room # 53A GE
phone: +48 22 2347994
fax: +48 22 2343653
e-mail:
A.Szymanska.1@elka.pw.edu.pl

Mateusz Śmietana, M.Sc. ('02), Ph.D. ('07) with distinction, D.Sc. ('14); Optoelectronics: optical fiber sensors, fiber gratings, fiber resonance devices; Thin Film: Physical and Chemical Vapor Deposition, Plasma Enhanced Deposition and Processing, Optical and Electrical Properties; Assistant Professor, full time, Division of Electronic Materials and Microsystem Technology, WUT Rector's Individual Award for Scientific Achievements ('08, '11, '14), Member of Optical Society of America ('12), IEEE ('12), and The Association of TOP 500 Innovators('12–), Scholarship from the Ministère de l'Éducation, du Loisir et du Sports du Québec, Canada ('09–'10), for young Ph.D. from Center for Advanced Studies Warsaw University of Technology ('09–'11), from Foundation for Polish Science ('11–'13), and for outstanding young scientist from Ministry of Science and Higher Education ('11–'14), Diploma of Minister of Science and Higher Education for project "Waveguide pressure sensor" ('12), Diploma International Warsaw Invention Show IWIS 2012 – Silver Medal for the Invention Optical Fiber Sensor using Bacteriophages for Bacteria Detection ('12), XI PROINVENT Gold Medal and Moldowa Ministry of Education Diploma for Optical fiber sensor with bateriophage overlay for selectve a bacteria detection ('13).

room # 424 GR
phone: +48 22 2346364
fax: +48 22 2346063
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), Member of Organizing Committee of ELTE ('13).

room # 120 GR
phone: +48 22 2345982
fax: +48 22 2346063
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, WUT Rector's Collective Award for Scientific Achievements ('09).

room # 234 GR
phone: +48 22 2347534
fax: +48 22 2346063
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 # 122 GR
phone: +48 22 2347772
fax: +48 22 2346063
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 Individual Award for Scientific Achievements (2nd stage) ('00), Secretary of the Elelectron Technology and Electronic Materials Section of the Polish Academy of Sciences ('03–'07) and ('07–), WUT Rector's Collective Award for Scientific Achievements ('06).

room # 422 GR
phone: +48 22 2347908
fax: +48 22 2346063
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 22 2347207
fax: +48 22 2343654
e-mail: wielgus@imio.pw.edu.pl

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

room # 56 GE
phone: +48 22 2347949
fax: +48 22 2343653
e-mail: P.Witonski@elka.pw.edu.pl

Adam Wojtasik, M.Sc.('83), Ph.D.('95) with distinction, 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 22 2347207
fax: +48 22 2343654
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 and Microwave Photonics Division, Head of Image and Microwave Photonics Division ('87–), Vice-Director of the Institute of Microelectronics and Optoelectronics ('84–'87), Member of the Faculty Council ('88–), Dean of the Faculty of Electronics and Information Technology ('90–'96), Chairman of the University Senate Committee on University Organisation ('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–'02), Member of Presidential Board of Polish Committee for Optoelectronics ('90–'93), Fellow of IEE ('95–), Member of the Scientific Council of the Institute of Vacuum Technology ('91–'95), Member of the Advisory Board of the Ministry of Post and Communication ('92–'96), Member of the Advisory Board of the Ministry of National Education: Financing Research at Universities ('93), Governmental Expert designated by the Polish Government ('96, '99), Chairman of the Siemens Award Jury (Poland) ('96–'02), Programme Coordinator ('97–'99) and Member of Programme Council ('95–'97) of the Programme for Reform of Higher Education and Research Organisation realized by Institute of Public Affairs, Member of the Committee on Science of science (Polish Academy of Sciences) ('96–'02), Deputy President (1997–1999), President (1999–2002) and Honorary President (2002––2005) of the Conference of Rectors of Academic Schools in Poland, Chairman of the Committee on Organisation and Legislation of CRASP ('97–'99; '05–'08; '08–'12; '12–14), President of the Conference of Rectors of Polish Universities of Technology ('97–'99), Member of National Consultative Council for Reforms in Education ('98–'01), Chairman of Auditing Committee and Member of the Mutual Aid Society of the French Legion of Honour (Polish Section) ('00–), Deputy Chairman and Member of National Council for European Integration ('99–'01), Member of the Committee on Good Practices in High Education ('05–), Member of Editorial Board of Higher Education in Europe – published by UNESCO ('99–'09), Facilitator of International Follow Up Committee of UNESCO World Conference on Higher Education ('98), Member of Council of European University Association ('00–'02), President of Polish Rectors Foundation ('02–), Director of the Institute of Knowledge Society ('03–), Chairman of the Presidential Team in Charge of Elaboration of the Project of Law on Higher Education ('03–'05), Chairman of the Committee "Poland in United Europe" at Polish Academy of Sciences ('03––'06), Member of the Forecast Committee "Poland 2000 Plus" ('03–'06), Chairman of Multi-branch Commission for Mobility and Science Career acting at Ministry of Science and Higher Education ('06–'08), Member of the Ministerial Team for prepare the Reforms of research and higher education in Poland ('08), Member of the Committee of Ethics in Science (Polish Academy of Sciences) ('08–'12, '12–), Chairman of the Committee of the project "The strategy of development of higher education: 2010–2020" ('09–'10), Member of the Forum of Experts in Ministry of Science and Higher Education ('10–), Member of the team of Central Commission for Degrees and Titles for new academic disciplines ('11–), Commander's Cross: Polonia Restituta ('11), Chairman of the Programme Board the Monthly "Academic Forum" ('03–'12), Member of the Ministerial Team for changes in legal acts about higher education ('12–13), WUT Rector's Individual Award for Organizing Achievements (2nd stage) ('12), Chairman of the Patronage Board of Monthly "Academic Forum" ('13–), President of the National Council for Science and Higher Education in Poland ('14–).

room # 156 GE
phone: +48 22 2347780,
+48 22 2343655
fax: +48 22 2345419
e-mail: J.Woznicki@imio.pw.edu.pl

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). WUT Rector's Collective Award for Organizing Achievements ('14).

room # 339 GR
phone: +48 22 2347534,
fax: +48 22 2346063
e-mail: zareba@imio.pw.edu.pl

2.2. Junior Research Staff

Krzysztof Anders, M.Sc. ('08), electronics and optoelectronics: fiber lasers and amplifiers, spectroscopy of active materials, Research Assistant Lecturer, Ph.D. Student, Optoelectronics Division, Member of the SPIE ('14), supervisor: Ryszard Piramidowicz

room # 127A GR
phone: +48 22 2345047
e-mail: K.Anders@imio.pw.edu.pl

Kamil Ber, M.Sc. ('14), Microelectronics, Electronics, Ph.D. Student, Microelectronics and Nanoelectronics Devices Division, supervisor: Romuald B. Beck

room # 337 GR
phone: +48 22 2347534
e-mail: k.ber@stud.elka.pw.edu.pl

Igor Butryn, M.Sc. ('15), Microelectronics, Electronics, Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Witold Pleskacz

room # 371 GE
phone: +48 22 2347207
e-mail: I.Butryn@stud.elka.pw.edu.pl

Marek Ciepłucha, M.Sc. ('12), Microelectronics, Electronics, Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Witold Pleskacz

room # 371 GE
phone: +48 22 2347207
e-mail: M.Cieplucha@stud.elka.pw.edu.pl

Tymoteusz Ciuk, M.Sc. ('12), Microelectronics, Electron Technology, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Jan Szmidt

room # 423a GR
phone: +48 22 2347785
e-mail: T.Ciuk@stud.elka.pw.edu.pl

Mariusz Derlecki, M.Sc. ('14), Microelectronics, Electronics, Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Witold Pleskacz

room # 365 GE
phone: +48 22 2345364
e-mail: m.derlecki@stud.elka.pw.edu.pl

Anna Katarzyna Dębowska, B.Sc. ('13), Microelectronics, Electron Technology, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Mateusz Śmietana

room # 423 GR
phone: +48 22 2347932
e-mail: anna.katarzyna.d@gmail.com

Magdalena Dominik (Szymańska), M.Sc. ('13), Microelectronics, Electron Technology, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Mateusz Śmietana

room # 423a GR
phone: +48 22 2347785
e-mail: m.szymanska.1@stud.elka.pw.edu.pl

Bartosz Fetliński, M.Sc. ('09), Electronic, Optoelectronic, Ph.D. Student, Optoelectronics Division, supervisor: Michał Malinowski

room # 026 GR
phone: +48 22 2347782
e-mail: B.Fetlinski@elka.pw.edu.pl
fetlinski@pv.pl

Aleksandra Golba, M.Sc. ('15), Electronic, Optoelectronic, Ph.D. Student, Optoelectronics Division, supervisor: Ryszard Piramidowicz

room # 128 GR
phone: +48 22 2345047
e-mail: golba@stud.elka.pw.edu.pl

Jakub Grochowski, M.Sc. ('12), Microelectronics, Electron Technology, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Ryszard Kisiel

room # 423a GR
phone: +48 22 2347785
e-mail: J.Grochowski@stud.elka.pw.edu.pl

Andrzej Grodzicki, M.Sc. ('10), Microelectronics, Electronics, Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Witold Pleskacz

room # 357 GR
phone: +48 22 2347207
e-mail: J.Grodzicki@stud.elka.pw.edu.pl

Jakub Jasiński, M.Sc. ('06), Microelectronics, Assistant, Microelectronics and Nanoelectronics Devices Division, supervisor: Lidia Łukasiak

room # 339 GR
phone: +48 22 2347534
e-mail: J.Jasinski@imio.pw.edu.pl

Anna Jusza, M.Sc. ('08), Optoelectronics: optical spectroscopy, laser materials, polymer composites, polymer fibers, photonic integrated circuits; Research Assistant Lecturer, Ph.D. Student, Optoelectronics Division, SPIE Student Member, supervisor: Ryszard Piramidowicz

room # 127A GR
phone: +48 22 2345047
e-mail: A.Jusza@imio.pw.edu.pl

Maciej Kamiński, M.Sc. ('15), Microelectronics, Electron Technology, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Jan Szmidt	room # 423 GR phone: +48 22 2347932 e-mail: mkamins7@stud.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: +48 22 2347782 e-mail: P.Knyps@elka.pw.edu.pl
Jakub Kopański, M.Sc. ('11), Microelectronics, Electronics, Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Witold Pleskacz	room # 371 GR phone: +48 22 2345364 e-mail: J.Kopanski@imio.pw.edu.pl
Aleksander Koter, M.Sc. ('10), Microelectronics, Electronics, Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Witold Pleskacz	room # 539 GR phone: +48 22 2345478 e-mail: A.Koter@imio.pw.edu.pl
Krzysztof Krogulski, M.Sc. ('13), Thin Film Plasma Deposition and Optoelectronic Devices, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Mateusz Śmietana	room # 423A GR phone: +48 22 2347785 e-mail: K.Krogulski.2@stud.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 # 423A GR phone: +48 22 2347785 e-mail: K.Krol@stud.elka.pw.edu.pl
Grzegorz Kurzejamski, M.Sc. ('14), Image and Video Processing, Techniques, Computer Vision, Image and Microwave Photonics Division, supervisor: Jerzy Woźnicki	room # 150 GE phone: +48 22 2347207 e-mail: g.kurzejamski@stud.elka.pw.edu.pl
Michał Łukaszewicz, M.Sc. ('11), Microelectronics, Electronics, Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Witold Pleskacz	room # 359 GR phone: +48 22 2345478 e-mail: M.Lukaszewicz@imio.pw.edu.pl
Krzysztof Madziar, M.Sc. ('06), Micorwaves, Lightwaves, Microwave Photonics: generation of microwaves involving photonic techniques, microwave-light interactions, Assistant, Image and Microwave Photonics Division from X.2008 till X.2011 – half-time, from XI.2011 – full-time, Award for distinguished paper – "Fiber Bragg Gratings Based Tuning of an Optoelectronic Oscillator" at International Conference on Microwaves, Radar and Wireless Communications – MIKON '14, supervisor: Bogdan Galwas	room # 50 GE phone: +48 22 2345783 e-mail: K.Madziar@elka.pw.edu.pl
Krzysztof Marcinek, M.Sc. ('09), Microelectronics, Electronics, Science Assistant, Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Witold Pleskacz	room # 366 GE phone: +48 22 2345364 e-mail: K.Marcinek@imio.pw.edu.pl
Piotr Mierzwiński, M.Sc. ('09), Microelectronics, Electronics, Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Wiesław Kuźmicz	room # 539 GR phone: +48 22 2347781 e-mail: P.Mierzwinski@elka.pw.edu.pl
Mateusz Mroczkowski, M.Sc. ('09), Microelectronics, Electron Technology, Science Assistant, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Jan Szmidt	room # 423B GR phone: +48 22 2347779 e-mail: M.Mroczkowski@stud.elka.pw.edu.pl
Michał Myśliwiec, M.Sc. ('13), Microelectronics, Electron Technology, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Ryszard Kisiel	room # 423A GR phone: +48 22 2347785 e-mail: M.Mysliwiec@stud.elka.pw.edu.pl
Łukasz Ostrowski, M.Sc. ('08), Optoelectronics, Ph.D. Student, Optoelectronics Division, supervisor: Ryszard Piramidowicz	room # 127A GR phone: +48 22 2345047 e-mail: L.Ostrowski.1@stud.elka.pw.edu.pl
Daniel Pietroń, M.Sc. ('15), Microelectronics, Electronics, Science Assistant, Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Witold Pleskacz	room # 539 GR phone: +48 22 2347781 e-mail: dpietron@stud.elka.pw.edu.pl

STAFF

Krzysztof Siwiec, M.Sc. ('09), Microelectronics, Electronics, Science Assistant, Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Witold Pleskacz	room # 371 GE phone: +48 22 2345364 e-mail: K.Siwiec@imio.pw.edu.pl
Michał Staniewski, M.Sc. ('10), Microelectronics, Electronics Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Andrzej Pfitzner	room # 360 or # 539 GR phone: +48 22 2347207 e-mail: M.Staniewski@stud.elka.pw.edu.pl
Bartłomiej Stonio, M.Sc. ('14), Microelectronics, Electron Technology, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Jan Szmidt	room # 423A GR phone: +48 222347785 e-mail: B.Stonio@stud.elka.pw.edu.pl
Dominik Tanous, M.Sc. ('10), Microelectronics, Ph.D. Student, Microelectronics and Nanoelectronics Devices Division, supervisor: Bogdan Majkusiak	room # 234 GR phone: +48 22 2347534 e-mail: D.Taonus@stud.elka.pw.edu.pl
Andrzej Taube, M.Sc. ('10), Microelectronics, Electron Technology, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Jan Szmidt	room # 423A GR phone: +48 22 2347785 e-mail: A.Taube@stud.elka.pw.edu.pl
Tadeusz Tenderenda, M.Sc. ('08), Optoelectronics, Ph.D. Student, Optoelectronics Division, supervisor: Ryszard Piramidowicz	room # 127a GR phone: +48 22 2345047 e-mail: T.Tenderenda@elka.pw.edu.pl
Michał Waśkiewicz, M.Sc. ('13), Microelectronics, Electron Technology, Science Assistant, Ph.D. Student, Electronic Materials and Microsystem Technology Division, supervisor: Jan Szmidt	room # 423a GR phone: +48 22 2347785 e-mail: M.Waskiewicz@stud.elka.pw.edu.pl
Łukasz Wiechowski, M.Sc. ('15), Microelectronics, Electronics, Science Assistant, Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Witold Pleskacz	room # 357 GR phone: +48 22 2347207 e-mail: dpietron@stud.elka.pw.edu.pl
Piotr Wiśniewski, M.Sc. ('14), Microelectronics, Ph.D. Student, Microelectronics and Nanoelectronics Devices Division, supervisor: Bogdan Majkusiak	room # 234 GR phone: +48 22 2347534 e-mail: P.Wisniewski.5@stud.elka.pw.edu.pl
Michał Wołodźko, M.Sc. ('15), Microelectronics, Electronics, Ph.D. Student, VLSI Engineering and Design Automation Division, supervisor: Wiesław Kuźmicz	room # 539 GR phone: +48 22 2347781 e-mail: mwolodzk@stud.elka.pw.edu.pl
Jacek Zawistowski, M.Sc. ('14), Image and Video Processing, Techniques, Computer Vision, Image and Microwave Photonics Division, supervisor: Jerzy Woźnicki	room # 148, 150 GE phone: +48 22 2347780 e-mail: j.zawistowski@stud.elka.pw.edu.pl

GR | Building of Radio Engineering – ul. Koszykowa 75
GE | Building of Electronics – ul. Nowowiejska 15/19
GG | WUT Main Building – Pl. Politechniki 1

2.3. Science Research Staff

NAME	DEGREE	POSITION	PHONE NUMBER	ROOM #
Krzysztof Anders	M.Sc.	Research Assistant Lecturer	+48 22 2345047	127A GR
Anna Jusza	M.Sc.	Research Assistant Lecturer	+48 22 2345047	127A GR
Andrzej Kaźmierczak	Ph.D.	Research Assistant Professor	+48 22 2347782	27 GR
Marcin Koba	Ph.D.	Research Assistant Professor	+48 22 2347782	28 GR
Norbert Kwietniewski	M.Sc.	Science Assistant	+48 22 2347785	423A GR
Wojciech Mały	Ph.D.	Professor	+48 22 2343654	360 GE
Krzysztof Marcinek	M.Sc.	Science Assistant	+48 22 2345364	366 GE
Mateusz Mroczkowski	M.Sc.	Science Assistant	+48 22 2347779	423B GR
Paweł Narczyk	M.Sc.	Science Assistant	+48 22 2345364	371 GE
Krzysztof Siwiec	M.Sc.	Science Assistant	+48 22 2345364	371 GE
Mariusz Sochacki	Ph.D.	Science Assistant Professor	+48 22 2347932	423C GR
Michał Waśkiewicz	M.Sc.	Science Assistant	+48 22 2347785	423A GR

2.4. Technical and Administrative Staff

NAME	DEGREE	POSITION	PHONE NUMBER	ROOM #
Anna Bednarek	B.A.	Secretary for Teaching	+48 22 2345047	159 GE
Ryszard Biaduń		Senior Foreman	+48 22 2347851	427 GR
Witold Ciemiewski		Senior Technician	+48 22 2347534	335 GR
Kazimierz Dalbiak		Senior Foreman	+48 22 2347534	335 GR
Jerzy Domański	M.Sc.	Senior R&D Engineer	+48 22 2345419	148 GE
Jerzy Gempel	M.Sc.	Senior R&D Engineer	+48 22 2347207	356 GE
Bożena Janus		Senior Technical Clerk	+48 22 2347771	236 GR
Stanisław Jeszka	M.Sc.	Senior R&D Engineer	+48 22 2347207	356 GE
Maciej Juźwik	M.Sc.	Senior R&D Engineer	+48 22 2347782	26 GR
Beata Karwan	M.A.	Financial Specialist	+48 22 2346059	237 GR
Krzysztof Krogulski		Senior Technician	+48 22 2347535	275 GE
Bogumiła Kwiatkowska		Reporting Specialist	+48 22 2346046	237 GR
Urszula Piotrkowicz		Accountant	+48 22 2347243	242 GR
Dagmara Rerak		Financial Specialist	+48 22 2346059	237 GR
Hanna Sater	M.Sc.	Promotion Specialist	+48 22 2347708	236 GR
Bogdan Sowa	M.A.	Financial Specialist	+48 22 2347771	236 GR
Sylwia Trubisz		Administrative Specialist	+48 22 2346046	237 GR
Katarzyna Trzaskowska	M.A.	Administrative Specialist	+48 22 2346018	236 GR

VLSI Engineering
and Design Automation Division

3. TEACHING ACTIVITIES

3.1. Basic Courses

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

[Edu2] **Analog Circuit Design for VLSI Systems** (Projektowanie układów analogowych dla systemów VLSI) **PUAV**, Wiesław Kuźmicz

[Edu3] **Application of Matlab in Calculation Methods** (Matlab w zastosowanych metodach obliczeniowych) **MZMO**, Mikołaj Baszun

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

[Edu5] **Digital Circuits** (Układy cyfrowe), **UCYF**, Elżbieta Piwowarska

[Edu6] **Electronic Elements and Circuits** (Elementy i układy elektroniczne), **ELIU**, Andrzej Pfitzner

[Edu7] **Electronic Elements and Circuits – Laboratory** (Elementy i układy elektroniczne – laboratorium), **ELIUL**, Andrzej Pfitzner

[Edu8] **Electronics 1** (Elektronika 1), **ELE1**, Lidia Łukasiak, Sławomir Szostak

[Edu9] **Electronics 2** (Elektronika 2), **ELE2**, Lidia Łukasiak, Jakub Jasiński

[Edu10] **Equipment – Programming Synthesis of Digital Systems** (Synteza sprzętowo – programowa systemów cyfrowych), **SSP**, Elżbieta Piwowarska

[Edu11] **Fields and waves**, (Pola i fale), **POFA**, Jerzy Piotrowski

[Edu12] **Fundamentals of Circuit and System Technology** (Podstawy technologii układów i systemów), **PTUIS**, Romuald Beck

[Edu13] **Fundamentals of Lasers** (Lasery – kurs podstawowy), **LKP**, Paweł Szczepański

[Edu14] **Fundamentals of Microelectronics** (Podstawy mikroelektroniki), **PMK**, Wiesław Kuźmicz

[Edu15] **Fundamentals of Microprocessor Techniques** (Podstawy techniki mikroprocesorowej), **TMIK**, Lidia Łukasiak

[Edu16] **Fundamentals of Microwave Engineering** (Podstawy techniki w.cz.), **TWCZ**, Jerzy Piotrowski

[Edu17] **Fundamentals of Photonics** (Podstawy fotoniki), **FOT**, Michał Malinowski

[Edu18] **Fundamentals of Solid State Electronics** (Elektronika ciała stałego), **ELCS**, Jan Szmidt, Witold Pleskacz

[Edu19] **Hybrid Systems** (Układy hybrydowe), **UKH**, Ryszard Kisiel

[Edu20] **Integrated Optoelectronics** (Optoelektronika zintegrowana) **OZT**, Michał Malinowski

[Edu21] **Introduction to Microsystems** (Wstęp do mikrosystemów), **WMS**, Zbigniew Pióro, Andrzej Mazurak

[Edu22] **Introduction to Numerical Methods** (Wstęp do metod numerycznych), **WNUM**, Jerzy Krupka

[Edu23] **Introduction to Programming** (Podstawy programowania), **PRM**, Marek Niewiński

[Edu24] **Introduction to the UNIX System** (Użytkowanie systemu UNIX), **USUX**, Andrzej Wielgus

[Edu25] **Ligthwave Telecommunication** (Telekomunikacja optofalowa), **TEOP**, Agnieszka Szymańska

[Edu26] **Meeting 1 – Fundamentals of Information Technology** (Zjazd 1 – Podstawy technologii informacyjnej), **ZJ1Z**, Krzysztof Madziar

[Edu27] **Meeting 4 – Advanced Course Laboratory** (Zjazd 4 – Zaawansowane laboratorium kierunkowe), **ZJ4Z**, Agnieszka Szymańska

[Edu28] **Methods of Image Acquisition and Processing for Photography** (Techniki rejestracji i obróbki obrazów w fotografii), **TROOF**, Marek Sutkowski

[Edu29] **Object Programming** (Programowanie obiektowe), **PROE**, Adam Wojtasik

[Edu30] **Operating Systems** (Systemy operacyjne), **SOE**, Andrzej Wielgus

[Edu31] **Optoelectronic Devices and Systems** (Elementy i systemy optoelektroniczne), **ESO**, Marcin Kaczkan

[Edu32] **Physical Fundamentals of Information Processing** (Fizyczne podstawy przetwarzania informacji), **FPPI**, Jan Szmidt, Bogdan Majkusiak

[Edu33] **Physics** (Fizyka ogólna), **FOM**, Mikołaj Baszun

[Edu34] **Programming for mobile Apple iOS and MacOS X** (Programowanie dla systemów: mobilnego iOS oraz MacOS X), **APIOS**, Adam Wojtasik

[Edu35] **Programming microcontrollers in C language** (Programowanie mikrokontrolerów w języku C), **PMIK**, Sławomir Szostak

[Edu36] **Semiconductor Devices** (Przyrządy półprzewodnikowe), **PP**, Lidia Łukasiak, Andrzej Pfitzner

[Edu37] **Semiconductor Devices** (Przyrządy półprzewodnikowe), **PPRM**, Antoni Siennicki

[Edu38] **Solid-State Physics** (Fizyka ciała stałego), **FCSM**, Jan Szmidt, Agnieszka Zaręba

3.2. Advanced Courses

[Edu39] **Advanced Technologies for Silicon Microelectronics and Photonics** (Zaawansowane technologie mikroelektroniki i fotoniki krzemowej), **ZTM**, Romuald Beck

[Edu40] **Advanced Semiconductor Structures** (Zaawansowane struktury półprzewodnikowe) **ZSP**, Lidia Łukasiak

[Edu41] **Analog Integrated Circuit Design for VLSI Systems** (Projektowanie bloków analogowych dla systemów VLSI) **PSSA**, Wiesław Kuźmicz, Tomasz Borejko

[Edu42] **Characterization of Materials for Microelectronics** (Charakteryzacja materiałów dla mikroelektroniki) **CHA**, Jan Szmidt, Aleksander Werbowy

[Edu43] **Computational Methods in Microelectronics and Photonics** (Metody obliczeniowe w mikroelektronice i fotonice), **MOBI**, Andrzej Pfitzner, Agnieszka Mossakowska-Wyszyńska

[Edu44] **Digital Image Processing** (Cyfrowe przetwarzanie obrazów), **CPOO**, Piotr Garbat

[Edu45] **Electronic and Photonic Devices for Telecommunication** (Przyrządy elektroniki i fotoniki dla telekomunikacji), **PEFT**, Bogdan Galwas

[Edu46] **Fiber-Optic Communication** (Komunikacja światłowodowa), **KOS**, Ryszard Piramidowicz

[Edu47] **Fundamentals of Nanoelectronics and Nanophotonics** (Podstawy nanoelektroniki i nanofotoniki), **NANO**, Bogdan Majkusiak, Paweł Szczepański

[Edu48] **Fundamentals of Photovoltaics** (Podstawy fotowoltaiki) **PFOT**, Stanisław Pietruszko

[Edu49] **Integrated and Logic Circuits for Optoelectronics** (Zintegrowane układy optoelektroniczne i optyczne układy logiczne), **ZOUL**, Michał Malinowski

[Edu50] **Introduction to Digital VLSI System Design** (Projektowanie scalonych systemów cyfrowych), **PSSC**, Zbigniew Jaworski

[Edu51] **Laboratory of Fundamentals of Nanoelectronics and Nanophotonics** (Pracownia podstaw nanoelektroniki i nanofotoniki), **PNAN**, Bogdan Majkusiak, Paweł Szczepański

[Edu52] **Lasers** (Lasery) **LAS**, Paweł Szczepański

[Edu53] **Microsystems Engineering** (Inżynieria mikrosystemów) **MIK**, Ryszard Kisiel

[Edu54] **Monte Carlo Methods – Fundamentals and Applications** (Metody Monte Carlo – podstawy i zastosowania), **MMC**, Marek Niewiński

[Edu55] **Nanotechnologies** (Nanotechnologie), **NAN**, Jan Szmidt, Aleksander Werbowy

[Edu56] **Optical Waveguide Lasers and Amplifiers** (Wzmacniacze i lasery światłowodowe) **WLS**, Ryszard Piramidowicz

[Edu57] **Photovoltaic Systems** (Systemy fotowoltaiczne), **SFOT**, Stanisław Pietruszko

[Edu58] **Vision Monitoring Systems** (Systemy monitoringu wizyjnego) **SYMW**, Piotr Garbat

[Edu59] **VLSI System Design** (Projektowanie systemów scalonych w technice VLSI), **PSSV**, Wiesław Kuźmicz, Zbigniew Jaworski

[Edu60] **3D Vision Systems** (Systemy wizji 3D) **SWIZ**, Jerzy Woźnicki

3.3. Courses in English

[Edu61] **Electronics 1, EELE1**, Bogdan Majkusiak

3.4. Courses for other Faculties

[Edu62] **Ecologic Aspects of Electronic Materials and Equipment Production, Faculty of Management** (Ekologiczne aspekty produkcji materiałów I urządzeń elektronicznych, Wydział Zarządzania), **EKASP**, Ryszard Kisiel

[Edu63] **Electromagnetic Compatibility, Faculty of Management** (Kompatybilność elektromagnetyczna, Wydział Zarządzania), **KOMEL**, Jerzy Piotrowski

[Edu64] **Electronic Circuits and the Introduction to Microelectronics, Faculty of Management** (Układy elektroniczne i wstęp do mikroelektroniki, Wydział Zarządzania), **UEMIK**, Sławomir Szostak

[Edu65] **Electronic Devices, Faculty of Management** (Elementy elektroniczne, Wydział Zarządzania), **ELEME**, Lidia Łukasiak

[Edu66] **Electronic Equipment Assembly Processes, Faculty of Management** (Inżynieria montażu urządzeń elektronicznych, Wydział Zarządzania), **IMUEL**, Ryszard Kisiel

[Edu67] **Electronic Equipment Design Techniques, Faculty of Management** (Techniki konstrukcji urządzeń elektronicznych, Wydział Zarządzania), **TEKUE**, Ryszard Kisiel

[Edu68] **Electronic Material and Structure Production Engineering, Faculty of Management** (Inżynieria produkcji materiałów i struktur elektronicznych, Wydział Zarządzania), **INMAS**, Mikołaj Baszun

[Edu69] **Electronics 1, Faculty of Mechatronics** (Elektronika 1, Wydział Mechatroniki), **ELE1**, Andrzej Jakubowski, Sławomir Szostak

[Edu70] **Electronics 2, Faculty of Mechatronics** (Elektronika 2, Wydział Mechatroniki), **ELE2**, Zbigniew Pióro

[Edu71] **Energy Conditioning and Storage Laboratory, Faculty of Physics** (Laboratorium przetwarzania i magazynowania energii, Wydział Fizyki) **LPME**, Michał Malinowski

[Edu72] **Information Techniques and Systems, Faculty of Transport** (Technologie i systemy informatyczne, Wydział Transportu), **TISI**, Jarosław Dawidczyk

[Edu73] **Introduction to Microprocessor Systems, Faculty of Management** (Wstęp do systemów mikroprocesorowych, Wydział Zarządzania), **WSYMI**, Zbigniew Pióro

[Edu74] **Laboratory of Nanotechnology, Faculty of Physics** (Laboratorium nanotechnologii, Wydział Fizyki), **NAN**, Robert Mroczyński

[Edu75] **Laboratory of Photonics, Faculty of Physics** (Laboratorium fotoniki, Wydział Fizyki), **FOT**, Ryszard Piramidowicz

[Edu76] **Laboratory of Physics 2, Faculty of Physics** (Laboratorium Fizyki 2, Wydział Fizyki), **FIZ2**, Janusz Parka

[Edu77] **Logic Circuits, Faculty of Management** (Układy logiczne, Wydział Zarządzania), **UKLO**, Piotr Firek

[Edu78] **Laser Technology, Faculty of Physics** (Technika Laserów, Wydział Fizyki), **TL**, Ryszard Piramidowicz

[Edu79] **Methods of Electronic Element Diagnostics, Faculty of Management** (Metody diagnostyki elementów elektronicznych, Wydział Zarządzania), **MEDEL**, Jan Gibki

[Edu80] **Photonic Devices, Faculty of Management** (Elementy fotoniczne, Wydział Zarządzania), **ELFOT**, Ryszard Piramidowicz

3.5. Courses in English for other Faculties

[Edu81] **Optical Fiber Technology, Faculty of Mechatronics** (Techniki światłowodowe, Wydział Mechatroniki), **OFT**, Ryszard Piramidowicz

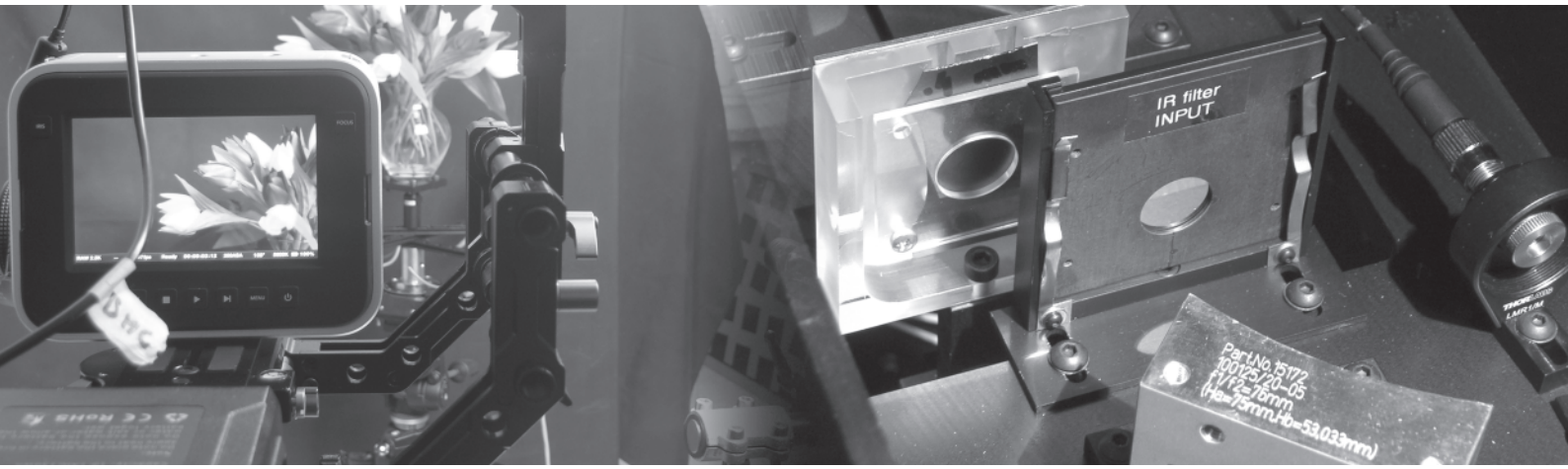


Image and Microwave
Photonics Division

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, May 2014–May 2015, **sub-projects:**

[Pro1.1] **Design, materials and technologies for microsystems in sensor technology** (Konstrukcje, materiały i technologie dla mikrosystemowych technik sensorowych), project leader: Jan Szmidt, co-workers: Michał Borecki, Aleksander Werbowy, Ryszard Kisiel, Mariusz Sochacki, Jerzy Krupka, Piotr Firek, Jerzy Kalenik, Mateusz Śmietana

[Pro1.2] **Investigations of nonlinear phenomena in Mach-Zender modulator in microwave photonic systems and optimization of 3D images in THz range realized in reflected (transmitted) system** (Badanie zjawisk nieliniowych w modulatorze Macha-Zendera w układach fotoniki mikrofalowej oraz opymalizacja zobrazowań 3D w zakresie THz realizowana w układzie odbiciowym (transmisyjnym)), project leader: Janusz Parka, co-workers: J. Woźnicki, P. Garbat, K. Madziar, M. Sutkowski, P. Witoński, J. Piotrowski, A. Szymańska, J. Domański

In first part of this work nonlinear properties of Mach-Zender transmission characteristics were investigated. This phenomena was used in optoelectronic oscylators in microwave range. In second part of this work the possibility of optimization of 3D images for application to THz range. Investigations were done using data from TDS (Time Domain Spectrosopy) for structures of chosen multilayer materials. Amplitude and phase of TDS signal was changed from different thickness of the layers. Final image was obtained from correlation function obtained for each pixel of obtained image.

[Pro1.3] **Modeling and investigation of optical materials, photonic structures and circuits** (Modelowanie, opracowanie i charakteryzacja materiałów, struktur i układów fotonicznych), project leader: Michał Malinowski

The project includes spectroscopic investigations of rare-earth activated solids for technological and biological applications. This concerns bulk, nanocrystalline and waveguide matrix for lasers and amplifiers, various phosphors, including white light and up-conversion phosphors, sensors, and photovoltaic conversion.

The project is focused on development of modeling tools for optical passive and active micro-photonic devices such as; planar and fiber waveguides, amplifiers and lasers, nonlinear optical high-finesse (ring, DFB/DBR, photonic crystal) resonators, power optimization and quantum noise analysis of amplifiers and lasers, laser action studies in new solid-state lasers, including waveguide and photonic crystal structures.

[Pro1.4] **Modification of properties of MOS test structures with high permittivity gate dielectric layers** (Modyfikacja właściwości struktur testowych MOS z dielektrykami bramkowymi w postaci warstw o wysokiej wartości przenikalności elektrycznej (high-k)), project leader: Robert Mroczyński

The main objective of this work is to examine the possibility of modifying the electro-physical properties of MOS structures with gate dielectric in the form of high-permittivity material. The influence of the thermal treatment onto the quality, stability and reliability of semiconductor structures will be examined and described. The proposed work is experimental. The analysis of the thermal stability of MOS structures is of the most importance for the application of high-k-based MOS devices in nowadays semiconductor structures.

[Pro1.5] **The methods of design automation for calibration of analog and RF integrated circuits implemented in submicron CMOS technologies** (Metody automatyzacji projektowania scalonych układów przestrajanych napięciem generatorów RF realizowanych w submikrometrowych technologiach CMOS), project leader: Andrzej Pfitzner; main contractors: Zbigniew Jaworski, Mariusz Derlecki; co-workers – other members of the VLSI Engineering and Design Automation Division.

In the framework of this project a calibration technique using back-gate biasing to minimize the mismatch impact in RF filters and operational amplifiers realized in 28 nm FD-SOI technology has been developed. This technique has been applied to an example sixth-order IF polyphase band-pass filter designs. The back-gate biasing concept has been also used to implement an autonomous offset compensation subcircuit for tranconductance operational amplifier. In addition, some analog blocks (comparator, capacitive divider based DAC) to be used in the design of adaptive ADC have been designed in the 28 nm FD-SOI technology.

[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, May 2015–May 2016, **sub-projects:**

[Pro2.1] **Design, technologies and materials for microsystems in sensor technology** (Konstrukcje, technologie i materiały dla mikrosystemowych technik sensorowych), project leader: Jan Szmidt, co-workers: Michał Borecki, Aleksander Werbowy, Ryszard Kisiel, Mariusz Sochacki, Jerzy Krupka, Piotr Firek, Jerzy Kalenik, Mateusz Śmietana

[Pro2.2] **Development of software tools for the diagnosis of analog integrated circuits** (Rozwój narzędzi programowych do diagnostyki analogowych układów scalonych), project leader: Andrzej Pfitzner; co-workers – other members of the VLSI Engineering and Design Automation Division.

[Pro2.3] **Technology and characterization of TFT transistors with active amorphous IGZO layers** (Technologia i charakteryzacja struktur tranzystorów TFT z aktywnymi warstwami amorficznego IGZO), project leader: Robert Mroczyński

The main (IGZO) amorphous layer and electrical characterization of fabricated test structures. The current work is a continuation of research studies that have been performed in the Institute of Microelectronics and Optoelectronics Warsaw University of Technology previously.

In the course of this work there has been designed the technology of TFT structures with Indium-Gallium-Zinc Oxide active semiconductor and hafnium oxide (H_fO_X) high-k gate dielectric layers. Both functional films were obtained by means of reactive magnetron sputtering in RF plasma. In order to select the most favorable semiconductor and dielectric layers in the final TFT structure, the extensive structural, optical and electrical characterization were performed.
The fabricated TFT transistors demonstrated relatively good electrical properties with a very low threshold voltage value (Ut~0.3 V), low sub-threshold swing (SS~400 mV/dec), and a relatively good Ion/Ioff ratio of the order of 4.
The development of this technology results in the possibility of implementation of new tasks and preparation of specialized 'clean-room' laboratory (located in Microelectronics and Nanoelectronics Devices Division) to fabrication of TFT structures on alternative substrates (especially in view of the ongoing work in the field of so-called transparent and flexible electronics), as well as carrying on scientific cooperation with other R&D units in Poland and abroad. Obtained in the course of this work findings were also used for the preparation of several publications on the National Conference of Electronics ("KKE 2015") and Electron Technology Conference ("ELTE 2016").

[Pro2.4] **The use of direct and external modulation, and nonlinear properties of Mach-Zender modulator in optoelectronic oscillators systems** (Wykorzystanie modulacji bezpośredniej i zewnętrznej oraz własności nieliniowych modulatora Macha-Zendera w układach oscylatorów optoelektronicznych), project leader: Janusz Parka, co-workers: J. Woźnicki, P. Garbat, K. Madziar, M. Sutkowski, P. Witoński, J. Piotrowski, A. Szymańska, J. Domański

[Pro3] **Active polymer fibers – new materials for fiber lasers and amplifiers applications** (Aktywne światłowody polimerowe – nowe materiały do zastosowań w układach laserów i wzmacniaczy światłowodowych), project leader: Anna Jusza, May 2015–March 2016

The main aim of the project is the development of manufacturing technology and investigation of luminescent properties of a new optically active materials – composite fibers based on polymer matrices doped with RE^{3+} metalo-organic complexes. It seems that RE^{3+} doped polymer lasers may create an interesting alternative for polymer lasers structures doped with organic dyes, however under the condition of overcoming problems with significant quenching of luminescence, being a result of interactions between RE^{3+} ions and highly energetic phonons, inherent for the polymer matrices. Doping of polymer material with RE^{3+} complexes, which would isolate active centers from the influence of matrix's phonons, may help solving this problem. Such composites enable combining the excellent lasing properties of solid state lasers and unique advantages of polymeric material – mechanical strength, flexibility and low cost of manufacturing. In particular, europium doped materials allow for obtaining the efficient emission in the orange (613 nm) spectral range – rare in laser technology.

[Pro4] **Composite polymer fibers doped with metalo-organic Dy^{3+} complexes – new generation of optically active media** (Kompozytowe światłowody polimerowe domieszkowane kompleksami metalo-organicznymi jonów Dy^{3+} – nowa generacja ośrodków aktywnych optycznie), project leader: Anna Jusza, June 2014–March 2015

The main aim of the project is the development of manufacturing technology and investigation of luminescent properties of a new optically active materials – composite fibers based on polymer matrices doped with RE^{3+} metalo-organic complexes. It seems that RE^{3+} doped polymer lasers may create an interesting alternative for polymer lasers structures doped with organic dyes, however under the condition of overcoming problems with significant quenching of luminescence, being a result of interactions between RE^{3+} ions and highly energetic phonons, inherent for the polymer matrices. Doping of polymer material with RE^{3+} complexes, which would isolate active centers from the influence of matrix's phonons, may help solving this problem. Such composites enable combining the excellent lasing properties of solid state lasers and unique advantages of polymeric material – mechanical strength, flexibility and low cost of manufacturing. In particular, dysprosium doped materials allow for obtaining the efficient emission in the blue (478 nm) and yellow (575 nm) spectral range – rare in laser technology.

[Pro5] **Construction of Multitasking Universal Prototyping Platform for Electronic Devices** (Budowa wielozadaniowego stanowiska do prototypowania urządzeń elektronicznych przez Koło Naukowe Mikrosystemów ONYKS), Students Scientific Association Microsystem (ONYKS), project leader: Jakub Jasiński, May 2015–December 2015

[Pro6] **Development of on-chip temperature calibration technique for analog front-end for precision human body temperature measurement for civil and military purpose**. (Opracowanie metody kalibracji typu on-chip (wewnątrz układu scalonego) analogowego toru do precyzyjnego pomiaru temperatury ciała człowieka dla potrzeb cywilnych i wojskowych), project leader: Paweł Narczyk, May 2015–March 2016

The main goal of the grant was to complete research work connected with doctoral thesis of the author. As a result of the grant the author had created a new temperature calibration technique for analog blocks of integrated circuits designed in nanometer technologies. As part of the previous research analog front-ends for precision human body temperature and skin resistance measurement were developed. The main difficulty was to obtaining the required very high accuracy over a very wide operating temperature range of an integrated circuit (from -40°C to +125°C). In such extreme temperatures, standard and generally known compensation and calibration temperature methods are not suitable to achieve the required measurement accuracy.

As a result of previously conducted research a theory, how to solve the problem described above, was established. During the grant the author checked the proposed solution. In the first stage calibration resistors, which are a key element of the author's temperature calibration technique, were measured. In the second stage a model of the analog front-end for precision human body temperature measurement with particular emphasis on the temperature calibration

technique was developed in Python. In the next step schematic and layout of the temperature calibration module were designed and integrated with previously designed the analog front-end. In the last stage of conducted research fabricated prototypes were measured in order to finally verify proposed solution. The practical result of the research is a complete system for precision human body temperature and skin resistance measurement for use in civil and military industry.

[Pro7] **Electrochemical biosensors with optically transparent layers of metal oxide** (Biosensory elektrochemiczne z warstwami transparentnych optycznie tlenków metali realizowany przez Koło Naukowe Mikroelektroniki i Nanoelektroniki KNMiN), Students Scientific Association of Microelectronic and Nanoelectronics (KNMiN), project leader: Mateusz Śmietana, May 2015–December 2015

[Pro8] **Fiber fuse – development and investigation of effect demonstrator parameters** (Lont światłowodowy (fiber fuse) – opracowanie i zbadanie parametrów demonstratora efektu realizowany przez Koło Naukowe Optoelektroniki KNO), Students Scientific Association of Optoelectronics (KNO), project leader: Ryszard Piramidowicz, May 2015–December 2015

[Pro9] **High power erbium fiber laser in all-fiber geometry** (Erbowy laser światłowodowy dużej mocy w geometrii all-fiber), project leader: Krzysztof Anders, June 2014–March 2015

The main aim of the project was to design, developed and examine operating parameters of prototype high-power erbium fiber laser generating ca. 5 W watts in 1550 nm region. As part of the work resonator elements using fiber Bragg gratings, integrated laser diodes power supplies and temperature stabilization drivers were developed.
Performed experiments with the use of double clad fiber doped with erbium and ytterbium confirmed the possibility of obtaining efficient generation at 1545 nm. "All-fiber" FBG resonator has been developed enabling to obtain stable and fully fiber optic laser construction. Laboratory model exhibit the 5 W output power and narrow spectral characteristics (FWHM $<$0.02 nm). Complete laser device was developed with particular emphasis on educational values.

[Pro10] **Investigation and analysis of optoelectronic oscillators infolving polarization splitting based microwave photonic filters for frequency selection** (Badanie i analiza oscylatorów optoelektronicznych pracujących z mikrofalowym filtrem fotonicznym opartym o zjawisko polaryzacji światła w światłowodzie), project leader: Krzysztof Madziar, May 2015––March 2016

The aim of the project was the investigation of microwave optoelectronic oscillators that involve special class of frequency selection devices – microwave photonic filters (MFF). This group of oscillators provide high frequency and high spectral purity output signal. They use photonic devices as fibers, optical resonators as high Q elements. Photonic elements can also be used as microwave frequency selection units – in configuration of microwave photonic filters. Oscillators were analyzed using open-loop approach. Most attention was paid to the behavior and shaping of their transmission characteristics by changing the state of light polarization in optical paths of the MFF. Conducted research led to establishing a high spectral purity, low phase noise oscillation at desired frequency with very low level of side spurious.

[Pro11] **Multichannel optical time domain reflectometer in generic integration technology** (Wielokanałowy reflektometr optyczny w technologii fotoniki scalonej), project leader: Stanisław Stopiński, May 2015–March 2016

Optical time domain reflectometers (OTDR) enable characterization of basic functional parameters of fiber-optic communication links. However, the functionality of devices currently available on the market is limited to single-channel operation, which means that only one optical fiber link can be monitored at the same time. The primary scientific goal of the project is designing, manufacturing and performing characterization of photonic integrated circuits that would allow realization of integrated multi-channel OTDR systems. The devices are realized in indium phosphide based generic integration technology. The design of integrated reflectometers uses active and passive photonic elements available on the SMART Photonics foundry platform.

[Pro12] **Reconfigurable wireless data acquisition system using the system PSOC** (Bezprzewodowy re-konfigurowalny system akwizycji danych wykorzystujący system PSOC realizowany przez Koło Naukowe Systemów Scalonych), Students Scientific Association of Integrated Circuits, project leader: Marek Niewiński, May 2015–December 2015

[Pro13] **Spectroscopic analysis of glass materials for applications in mid-infrared light sources** (Badanie i analiza spektroskopowa materiałów szklanych do zastosowań w źródłach światła na zakres średniej podczerwieni), project leader: Krzysztof Anders, May 2015–March 2016

Aim of the project was to study and analyze the mid-infrared emission properties of low-phonon glasses (chalcogenide and fluorozirconate) doped with rare earth ions. The project scope covered measurements and analysis of the absorption characteristics (both room temperature and cryogenic temperatures) that allows precise determination of location and determination of the energy levels and absorption cross section coefficients, measurements and analysis of refractive indices of glasses (with m-line spectroscopy) for determining reflection from the test materials, measurement and analysis of Raman spectra for determining the phonon energy of the active glasses, measurements and analysis of the emission spectra and fluorescence dynamics characteristics of the of excited states, analysis of basic parameters of emission (lifetimes levels and cross sections for the emission) and analysis of radiative and non-radiative transition probabilities.

[Pro14] **The generic GNSS processor architecture for satellite navigation systems** (Uniwersalna architektura procesora dla systemów nawigacji satelitarnej GNSS), project leader: Krzysztof Marcinek, November 2014–March 2015

The aim of this work was to continue the process of development of the proposed microprocessor systems design method. The taken Ph.D. dissertation thesis was verified through the extensive computer simulations on the high performance PC workstation. The obtained results were implemented on the developed microprocessor system using Xilinx ML-605 FPGA board. The project of the physical implementation of the designed microprocessor system was done using UMC CMOS 130 nm technology. The equipment purchased during the project was used to design and assembly of the evaluation PCB board for the manufactured ASIC containing parts of author's Ph.D thesis. The long-term objective of the project is to complete the text of the doctoral dissertation and obtain the Ph.D. degree.

[Pro15] **Tunable lasers in photonic integration technology** (Przestrajalne źródła laserowe w technologii fotoniki scalonej), project leader: Stanisław Stopiński, June 2014–March 2015

The scientific objective of this project is focused on development of an integrated version of a tunable laser light source. Tunable lasers find application in fields such as telecommunications, fiber-optic sensor networks, optical spectroscopy, metrology and others. However, so far they are either realized as bulky devices or have short tuning range. The main goal of the project is realizing a miniaturized device tunable within a broad wavelength range. The devices are designed and fabricated in an InP-based generic integration technology, which is a radically new way of developing photonic devices. Characterization of the fabricated devices is performed in the Laboratory of Integrated Photonics, developed and equipped in the framework of the EU project FOTEH.

4.2. Projects Granted by the Ministry of Science and Higher Education

[Pro16] **Neuronal cell cultures substrates with optical fiber sensors monitoring** (Podłoża do hodowli neuronalnych z monitorowaniem stanu hodowli przez czujniki światłowodowe), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Anna Katarzyna Dębowska (supervisor: Śmietana Mateusz), October 2014–July 2017

In this project we want to explore the possibilities of monitoring neuronal cultures with the use of optical fiber sensors. Studying in vitro cultured neuronal networks provides important data about the processes taking place in the human brain. However, the means of collecting the information about the propagation of action potentials, and communication between cells and groups of cells, are still imperfect. We want to develop a new way of recording neuronal activity, basing on the measurement of changes in the refractive index of the cell membrane. The project is funded by the Polish Ministry of Science and Higher Education and is a part of PhD thesis.

4.3. Projects Granted by National Centre for Research and Development

[Pro17] **Directed-energy laser weapon systems, Non-lethal laser weapon systems** (Laserowe systemy broni skierowanej energii, laserowe systemy broni nieśmiercionośnej), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Ryszard Piramidowicz, August 2015–June 2018

The project aims to develop a set of demonstrators of: solid state lasers for directed energy laser weapon systems; laser systems and technologies for directed energy laser weapon systems; detection and measurement systems; prevention and protection technology against directed energy laser weapon systems; non-lethal laser weapon systems. The project will also result in identification of the risk associated with the use of non-lethal laser weapon and investigation the effects of laser weapon systems on construction materials, military devices and biological tissues.

[Pro18] **Innovative graphen-titanium engine valve with improved functional properties** (Innowacyjne grafenowo-tytanowe zawory silnikowe o podwyższonych właściwościach użytkowych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jan Szmidt, April 2013–February 2016

The subject matter of the project covering development, based on a comprehensive interdisciplinary research, of a new material in the form of lightweight titanium alloys coated with graphene, with improved mechanical, physical and chemical properties for potential applications in the automotive industry will be an important contribution to research in the field of surface engineering and environmental protection. Developing a comprehensive characterization of performed graphene coatings, graphene/titanium alloy systems will form the basis for the phenomenological description of the phenomena occurring at the influence of certain loads. The performance tests of the finished product, in the form of graphene-titanium engine valves shall allow to estimate the changes that have occurred in the structure of Ti alloy and graphene coating, as a result of service loads of the developed final product. Thanks to this it will be possible to estimate the extent to which the graphene coatings covering the surface of the engine valves affect their functional parameters. As a result of the project implementation the primary utilitarian effect of the project will be the production of graphene-titanium engine valves, retaining stability even under extreme operating conditions, the experimental determination of their properties and analytical-numerical models of the valve behavior.

[Pro19] **Integrated circuit technology for measurement of psychophysiological parameters under dynamic conditions** (Mikroukładowa technologia pomiaru parametrów psychofizjologicznych w warunkach dynamicznych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Witold Pleskacz, co-workers: Tomasz Borejko, Jakub Kopański, Krzysztof Marcinek, Paweł Narczyk, Maciej Plasota, Tomasz Radomski, Krzysztof Siwiec, Andrzej Wielgus, October 2012–April 2016

The project aims to develop a new integrated circuit technology enabling the measurement of psychophysiological parameters under dynamic conditions. It will allow integration of multiple systems and measuring circuits inside the IC chip. Solution developed in the design will reduce the dimensions of the current applied solutions, increase reliability, lower power consumption and increase the possibility of applications.

New integrated circuit technology for measurement of psychophysiological parameters will be implemented through two parallel developed original solutions: bioSoC and bioSiP. BioSoC is a specialized integrated circuit, with the analog-digital signal processing paths and microcontroller for processing and analyzing data. BioSiP is a minimodule developed for integrating functions and measurement capabilities of modern diagnostic equipment. The developed measurement system will be attractive as a new generation of mobile devices, component monitoring systems and health care.

The project will result in measurement modules made on basis of the bioSiP and the bioSoC technology. Modules will be a part of drivers monitoring stand. During realization of bioSoC modules, projects of following blocks will be developed: ECG measurement chain, EMG measurement chain, resuscitation rate measurement chain, sigma-delta A/C converter, power management block, I/O interfaces, microcontroller and RTC clock. Blocks will be integrated in a silicon die, which will be fabricated and packaged in plastic or ceramic package.

During realization of bioSiP modules, projects of chosen sets of bioSiP modules and complete research stand will be developed. The stand will be used to perform necessary tests of developed modules, including experimental tests of drivers. Software controlling bioSiP modules and research stand controlling system will be created.

[Pro20] I**ntegretaion of thermoeletrically cooled infrared photodetectors with wideband electonics** (Integracja detektorów podczerwieni chłodzonych termoelektrycznie lub pracujących w temperaturze otoczenia z szerokopasmowym układem odbiorczym), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Ryszard Kisiel, October 2013–November 2015

The project is aimed at development of a technology for integration of middle and long wavelength photodetectors with wideband electronics in miniature packages and creating a series of high-performance detection modules for a wide range of applications in modern optoelectronic systems. For building such modules, new detector chips will be designed and realized, and appropriate packages for them as well as IC amplifiers selected. Designing the modules will be based on electrical measurements of the detector chips, amplifiers and their interconnects, and aided with electromagnetic and circuit simulations. Several types of optimized detection modules will be realised and characterized to demonstrate maturity of the newly developed technology to the industrial implementation and the advance in the functionality and reliability performances of the modules achieved in comparison to existing counterparts.

[Pro21] **Light sources with cold emitters** (Źródła światła z zimnymi emiterami), Tele & Radio Research Institute, Institute of Physics of The Polish Academy of Sciences, Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jan Szmidt, co-worker: Piotr Firek, Jerzy Kalenik, November 2012–October 2015

The practical goal of the project is to elaborate a repetitive, stable in emission and highly efficient source of light with field emitter prepared from nannocomposite carbonaceous-nickel film (C-Ni). Our previous studies (performed during realization of MNT ERA NET project) enabled for an elaboration of technology for preparation of highly efficient field emission C-Ni films. These films are obtained by PVD and by PVD/CVD methods. In this project we will examine reasons and mechanisms of phenomena harmful for efficiency and stability of field emission from the films working in model system that is very closed to proposed for light source production. For achieve this goal there will be performed following groups of tasks:

1) studies of stability and durability of emitters prepared of nanocomposite C-Ni films;
2) characterization by TEM and SEM of C-Ni film before and after application in a cathode;
3) elaboration of energy-efficient and stable supplying system.

[Pro22] **Logistics and monitoring technologies and ways to protect the environment before starting work, during drilling, hydraulic fracturing processes and during the operation, including monitoring of groundwater, air, noise, soil, greenhouse gases and other** (Logistyka i technologie monitoringu oraz sposoby ochrony środowiska przed rozpoczęciem prac, w trakcie wiercenia, w procesach szczelinowania hydraulicznego oraz na etapie eksploatacji, w tym monitoring wód podziemnych, powietrza, hałasu, gleby, emisji gazów i innych), Warsaw University of Technology, project leader: Jarosław Arabas, **Task 3: Multiparametric sensor of liquid surface monitoring as possible methane source** (Analiza czujników metanu w kierunku aplikacji do monitorowania powierzchni zbiornika cieczy), sub-project leader: Michał Borecki, October 2013–September 2016

The objective of the project is construction of low cost sensor that can continuously monitor surface of the flowback water pit as a methane source. For this purpose we plan to implement two innovations. The first is the study of multiparametric methane sensor that consist of modified NDIR and SnO_2 heads equipped with additional aerosol, humidity and temperature sensing units. The second is the study of integration technology multiparametric sensor in supernatant construction which is connected with development of local data processing methods.

[Pro23] **Methods and means of protection and defense against high power microwave pulses** (Metody i sposoby ochrony i obrony przed impulsami HPM), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Mariusz Sochacki, co-workers: Jan Szmidt, Piotr Firek, December 2014–December 2020

The protection and defense system against high power microwave pulses will be equipped with a limiting diodes. The protection semiconductor devices will be designed, manufactured and characterized in the Institute of Microelectronics and Optoelectronics. Wide bandgap semiconductors can be used in such kind of application, primarily the silicon carbide (SiC) wafers. The diodes will be characterized by means of current-voltage and capacitance-voltage measurements. Finally, the microwave properties of the devices will be studied, which is important especially in the context of their application in microwave transceiver circuits.

[Pro24] **New integrated photonic passive optical network** (System WDM-PON w technologii fotoniki scalonej), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Ryszard Piramidowicz, October 2015–March 2018

The main aim of the project is development and investigation of a novel solution for optical access systems – WDM-PON system, based on photonic integrated circuits (PICs) as well as elaboration of the roadmap for implementation of such a solution in real systems of telecom operators. The scope of the project covers in particular designing, manufacturing, versatile characterization and evaluation of key transceiver PICs for WDM-PON access systems, as well as photonic components for application in its nodes. As a result – the demonstrator of the system with implemented PICs components will be developed, allowing determination of the technical and economic capabilities of deploying the proposed solution in real systems.

[Pro25] **Optoelectronic monitoring of patients conditions in MRI** (Optoelektroniczny monitoring stanu pacjenta w rezonansie magnetycznym), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Ryszard Piramidowicz, July 2015 – December 2015

The project aims at development and investigation of optoelectronic monitoring system dedicated to noninvasive measurements of basic physiological parameters (heart rate, respiratory rate and temperature) of patients in a strong magnetic field, typical for magnetic resonance imaging (MRI).

The scope of the project covers manufacturing and investigation of a hybrid monitoring system, consisting of two subsystems – the network of fiber Bragg grating based sensors with interrogator realized in photonic integration technology and complementing imaging subsystem with advanced analysis of image data. As a final result, it is planned to set up the demonstrator of the system, tested in real conditions and allowing determination of the technical and economic capabilities of deploying the proposed solution in real MRI and computed tomography systems.

[Pro26] **Soldier psychological profile management system including development and use of HEALTH-CHIPS technology** (System zarządzania profilami psychologicznymi żołnierzy z opracowaniem i wykorzystaniem technologii HEALTH-CHIPS), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Witold Pleskacz, co-workers: Andrzej Berent, Tomasz Borejko, Igor Butryn, Mariusz Derlecki, Patryk Kłoczko, Jakub Kopański, Krzysztof Marcinek, Maciej Moskała, Paweł Narczyk, Daniel Pietroń, Maciej Plasota, Tomasz Radomski, Krzysztof Siwiec, Paweł Wiecha, Łukasz Wiechowski, Andrzej Wielgus, May 2013–May 2016

The main goal of the project is to elaborate psychological profiles management system. In technological aspect, the project aims to develop unique in the world wearable integrated circuit, which will allow continuous monitoring and immediate analysis of physiological parameters of human body (including heart activity, respiration rate, oxygen saturation of blood, skin resistance, skin temperature and air pressure). "Health-Chips" (HeC) technology will be a part of experimental research leading to development of universal profiles of soldiers, taking into account their psychophysiological characteristics and level of training. HeC technology will consist of a few functional elements: dedicated integrated circuit BioChip (BCp), logical structure of psychological profiles and intelligent analytical software implemented in BCp, psychological profiles management system.

Realization of the main goal requires development of new technology in the area of sensors, data acquisition and processing techniques, proper modeling and inference to find soldier psychological profile.

[Pro27] **Supporting Educational Initiatives of the Warsaw University of Technology in Teaching and Skill Improvement Training in the Area of Teleinformatics** (Wsparcie inicjatyw Politechniki Warszawskiej w kształceniu i doskonaleniu w zakresie innowacyjnych technik teleinformatycznych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics in cooperation with University of Luxembourg, University of Nantes, and University of Copenhagen, sponsored by UE within Human Capital Operational Programme, POKL.04.01.01-00-086/13, project leader: Sławomir Słominski, task leader: Elżbieta Piwowarska, Marchr 2014–June 2015

The project is aimed at undertaking and developing innovative initiatives, methodologies and tools for supporting teaching and skill improvement training of students, academic staff, and professionals in the area of telecommunications, computer engineering, digital security, business analytics and R&D project management. The common thread going across all the tasks is e-learning, distance learning and hands-on exercises. Among others the following activities will be carried out: (i) postgraduate courses in the fields of telecommunications, cyber security, big data and business analytics; (ii) "Do It Yourself" workshops and hackathons (Arduino, Raspberry, 3D printers, actuators); (iii) a summer school in the field of micro- & optoelectronics and terahertz technologies; (iv) fellowships and study tours.

[Pro28] **Ultrafast Photodetector based on Graphene (PhotoGraph)** (Ultraszybkie fotodetektory grafenowe), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Paweł Szczepański, March 2013––December 2015

Graphene has shown to possess physical properties that make it suitable for light detecting with unique characteristics. The main objective of this project is to take advantage of these properties for developing graphene-based infrared photodetectors (GPDs) characterized by exceptional features. The main goal is to obtain very high speed, exceeding that available in uncooled devices based on narrow gap semiconductors.

We propose the GPD that will work in the middle and long wavelength (from 3 to 14 μm) infrared range. The device will operate at ambient temperature or at temperatures 300 to 180 K, achievable with low cost Peltier coolers. Importantly, the GPD will be characterized by usable signal to noise ratio level and response speed much faster compared to the existing IR devices operating at the same spectral range and temperature range.

We expect to achieve useful performance with careful design of active element and use of various solutions previously used in the LWIR IR photodetectors operating at near room temperatures. By doing so, we expect that the grapheme based infrared devices will be a subject of practical implementation and commercial fabrication for advanced optoelectronic applications.

[Pro29] **VESTIC: a new manufacturing technology for integrated circuits** (VESTIC: nowy sposób wytwarzania układów scalonych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Wiesław Kuźmicz, December 2012–November 2015

The topic of the project is VESTIC – a new manufacturing technology for silicon-based monolithic integrated circuits. The goal of the project is to develop a version of it mature enough for industrial applications. The advantages of VESTIC are: highly regular structure of circuits built of 3D active components, a new transistor named VeSFET, which is an ideal active device for ultra-low power circuits, simple shapes on lithographic masks making nanometer-size components easier to manufacture. The VESTIC-based circuits can be manufactured using the same processes and materials that are used in standard CMOS technology; however, the sequence of operations is different. It is expected that the VESTIC--based circuits will be less expensive and the NRE costs of new designs will also be significantly lower. The expected results of the project are: manufacturing process suitable for a pilot fab line for ASICs and demonstrators: digital and analog circuits.

4.4. Projects Granted by the National Science Centre

[Pro30] **Conductive photonic structures for multiparametric bio-chemical diagnostics** (SONATA BIS Przewodzące struktury fotoniczne do wieloparametrycznej diagnostyki biochemicznej), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Mateusz Śmietana, May 2015–May 2019

The main objective of this project is to design, fabricate and characterize a platform of a new class of optical-fiber-based bio-sensor employing transparent and electrochemically active thin overlays. The obtained sensors will be additionally functionalized with organic bio-film and capable for simultaneous label-free optical and electrochemical measurement, or optical measurement of biochemical interactions taking place at sensor's surface for stimulated (controlled) electrochemical potential. Combination of these two optical and electrochemical systems within one sensing structure will allow for selective detection and multi-parameter analysis of bio-analytes reaching surface of the overlay.

[Pro31] **Development of an accurate model of traps in metal/insulator/4H-SiC structures by Thermally Stimulated Current (TSC) measurement** (Konstrukcja precyzyjnego modelu pułapek w strukturach metal/dielektryk/4H-SiC przy wykorzystaniu pomiaru prądu wzbudzanego termicznie (TSC)), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jan Szmidt, April 2013–February 2016

The aim of the research is the use of the method of characterization using the temperature change of the sample to determine the energy structure of electrically active traps in SiO_2/SiC interface and cross-section of the trap, resulting in a realistic possibility of linking the results of electrical measurements of the traps with the reasons for their formation. A new setup will be designed and implemented to measure Thermally Stimulated Current (TSC) of MIS test capacitors. It was hypothesized that the application of room temperature techniques without the use of light in the spectrum strongly connected with the absorption edge of the semiconductor material, such as the commonly used Terman method based on the measurement of high-frequency capacitance-voltage characteristics (HF C-V) gives too low energy resolution of traps position in the bandgap, and the sensitivity of the method at room temperature is often too small for the characterization of samples with the best performance (low density of traps).

[Pro32] **Electrical characterization of the advanced MIS structures in the range of low and very low frequencies** (Elektryczna charakteryzacja zaawansowanych struktur MIS w zakresie niskich i bardzo niskich częstotliwości), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jakub Jasiński, July 2013–January 2016

Search for new dielectric layers is one of the important development trends of contemporary microelectronics. These layers are applied in almost all types of modern semiconductor devices (gate dielectrics of MIS capacitors and transistors, non-volatile memory cells). Simultaneously the development of microelectronic industry is always accompanied by scaling. Reduction of device dimensions leads to the intensification of carrier tunneling through ever thinner dielectric layers.

In the case of ncMOS structures tunneling a is a process which leads to charge/discharge nanocrystallites, while in multi-layer high-k dielectrics with a thin buffer layer the tunneling current may charge/discharge traps located at the interface between dielectric layers and built-in high-k layer.

The nature of the charge/discharge processes mentioned above and the accompanying mechanisms of carrier transport in the ultra thin dielectric layers seems to be revealed in the range of low and very low frequencies, due to the fact that time constants of these processes can be high in certain situations. The Authors of this application, however, did not find the results of such characterization of mentioned structures in the literature. The characterization presented in the literature is usually limited to static I(V) characteristics or C(V) and G(V) curves at frequencies equal or higher than 500 Hz.

Deeper understanding of the phenomena accompanying the current flow through the dielectric layers mentioned above may require characterization in a wider frequency range, beginning from a few hundredths Hz. This will enable development of a more comprehensive small-signal model of the investigated layers than that presented in the literature. The model will most probably contain elements denoting phenomena that may only be observed at low-frequency measurements. This will also enable extraction of electrophysical parameters of the structure that could not be extracted so far.

[Pro33] **Investigation on interaction between bio-active media and electromagnetic field in photonic crystal fiber devices with suspended core** (OPUS Badanie oddziaływania struktur aktywnych biologicznie z polem elektromagnetycznym w układach światłowodów fotonicznych z zawieszonym rdzeniem), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Mateusz Śmietana, February 2015–February 2018

The primary goal of this research project is to design and characterize of a platform for a new class of bio-sensor enabling label-free detection of biological substance, based on measurement of interactions between electromagnetic field and biologically active layer, immobilized inside microchannels of a suspended-core fibre or also on its outer surface. The thesis of the research project is, that a label-free detection of biological compounds, based on a spatially confined interaction with E-M wave and with the binding layer on the inner surface of microchannels of a suspended-core microstructured fibre, may be a viable alternative to fluorescence label-based detection, as well as to plasmonic or waveguide-based sensing structures.

[Pro34] **Microstructure Analysis of Electroluminescent Zinc Sulphide Phosphors for Application in Printed Electronic Devices** (Analiza zjawisk degradacji starzeniowej siarczku cynku, na potrzeby nowej generacji elastycznych elektroluminoforów), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Mateusz Mroczkowski, February 2014–February 2015

The objective of the research project was to perform the analysis of zinc sulphide phosphors, in order to determine changes that take place during phosphors' degradation. It was also of interest to find how such changes in microstructure relate to the changes of parameters of phosphors, such as luminance.

In the first phase of the project, a series of test thick-film alternating-current electroluminescent (ACEL) lamps were fabricated. In the second part of the research, test samples were degraded by applying an alternating electric field that had frequency from 100 Hz to 20 kHz. Next, microscopic studies (TEM, SEM, EDS) of degraded samples were performed. No changes of microstructure of copper-dopped ZnS phosphors were observed.

[Pro35] **Novel luminescent materials for mid-infrared region – analysis and investigation of optical properties of chalcogenide glasses doped with rare earth ions** (PRELUDIUM Nowe materiały luminescencyjne na zakres średniej podczerwieni – badanie i analiza właściwości optycznych szkieł chalkogenidkowych domieszkowanych jonami ziem rzadkich), project leader: Krzysztof Anders, February 2014–February 2017

The aim of the project is to investigate and comprehensively analyse the mid-infrared radiation conditions of chalcogenide glasses doped with rare earth ions. The set of studied materials consists of experimental series of bulk samples of low phonon chalcogenide glasses (based on GeAsGaSe compounds) doped with praseodymium, dysprosium, terbium and holmium. The framework of the project is research and analysis of the spectroscopic properties (absorption, excitation and emission characteristics; fluorescence dynamics, including the measurements in the cryogenic temperatures ~7K) that will allow analysis of excitation and relaxation mechanisms of electron states responsible for the emission in the mid-infrared region – MIR (> 3 um). Until now, this spectral range, particularly attractive for application in metrology, sensing, medical, and military, has been practically out of reach of typical, compact laser sources (semiconductor lasers and solid state lasers).

[Pro36] **Optical gyroscope in an experimental photonic integration technology – analysis of possibility of realization and research on basic properties** (Żyroskop optyczny w eksperymentalnej technologii fotoniki scalonej – analiza możliwości wykonania i badania podstawowych właściwości), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Stanisław Stopiński February 2014–February 2016

The main project objective is research and analysis of possibility of realizing a monolithically integrated optical gyroscope in an experimental, indium phosphide based photonic integration technology. Tackling of this problem is mainly inspired by the recent advances in the field of fabrication technology of integrated optoelectronic devices, combined with pure scientific curiosity. However, in a longer perspective proving the proposed hypothesis can pave the

way for launching projects oriented towards applied research, potentially interesting for the Polish navigation systems industry. The scientific challenge is very attractive – to the author's best knowledge there are no examples of realization of a fully integrated optical gyroscope, despite a large research effort in this field.

[Pro37] **Oxide nanostructures for electronics, optoelectronics and photovoltaics** (Nanostruktury tlenkowe do zastosowań w elektronice, optoelektronice i fotowoltaice), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jan Szmidt, June 2013–June 2018

The aim of this project is an explanation and description of complex electro-optical properties of a group of wide band gap oxide materials (Al_2O_3, HfO_2, ZrO_2, ZnO). Despite the fact that these materials are presently key elements of modern electronic (gate oxides, transparent electronics, memories), optoelectronic (transparent contacts) and photovoltaic (transparent contacts) devices, influence of growth conditions on their electrical and optical properties is still not clear. By selecting growth conditions we can deposit both dielectric (isolating) and semiconducting layers, in the case of ZnO even with a metallic conductivity. Doped in a controlled way, grown at specific conditions, thin layers of ZnO should enable us construction of transparent contacts to wide band gap semiconductors (SiC, GaN). To achieve the goals of the project we should answer several questions on the origin of shallow donors in ZnO, in particular the role of hydrogen in these films (our present investigations question the fact that hydrogen is dominant shallow donor in our films), on the role played by vacancies in conductive and dielectric films, on the method of recrystallization blocking of gate oxides, on the mechanisms of compensations in ZnO layers grown in the ALD processes with ammonia water. We will investigate why gate oxides (mainly HfO_2) have excellent isolating properties, when deposited as amorphous ones, but loose these properties after recrystallization. Thus, the ways to block their recrystallizations are crucial and need detail investigations. The working hypothesis is that small deviations from oxides stoichiometry importantly affect electro-physical material parameters of selected oxides.

[Pro38] **Study on possibilities of shaping the luminescent properties of composite white light sources based on polymer materials** (PRELUDIUM Analiza możliwości kształtowania właściwości luminescencyjnych kompozytowych źródeł światła białego na bazie materiałów polimerowych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Anna Jusza, February 2014–February 2017

The aim of this project is an investigation and analysis of the shaping possibilities of visible (red, green and blue) luminescence properties of the new class of optically active materials – composites based on polymer matrices doped with nanocrystals activated by praseodymium ions. Investigated materials oxide, fluoride and oxyfluoride nanocrytallites of varying crystalline structure doped with different concentration of Pr^{3+} as well as bulk polymer composites based on PMMA (poly[methyl methacrylate]) doped with these nanocrystals. Selection of the praseodymium as the activator is mainly due to the favorable energy levels scheme allows for obtaining emission in red, green and blue spectral range and thus white light with a color temperature dependent on the ratio between the intensities of individual optical transitions. High sensitivity of praseodymium optical properties on crystalline surroundings parameters is an additional advantage, should provide the ability of manipulating of the individual emission lines intensities.

The main outcome of this project will be the extension of the state of the art on the influence of crystalline surroundings (crystalline phase, net position, surface states, maximum phonon energy) and structural properties (specific surface area, average particle size, agglomeration level) on the luminescent properties of praseodymium doped nanocrystals as well as polymer-based composites activated with these nanopowders.

[Pro39] **Technology and characterization of ultrathin silicon layers formed by means of PECVD for nanelectronic applications** (Technologia i charakteryzacja ultracienkich warstw krzemu wytwarzanych metodą PECVD na potrzeby struktur nanoelektronicznych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Romuald B. Beck, August 2012–August 2015

The main aim of this project is to screen experimentally the possibility of using PECVD as a method of formation of ultrathin silicon layers in nanodevices basing on double barrier structure (i.e. with ultrathin layers stack: insulator-silicon-insulator).

Within this project we plan optimization of Si PECVD in order to achieve full control of growth of the Si layer in ultrathin range, while preserving possibly best properties of this layer at the same time. We will also investigate dependencies between processes used (and their parameters) and electrophysical properties which are critical for application of the studied technologies to manufacturing the nanodevices basing on such a stack (tunneling and resonant tunneling, Coulomb blockade, or 3D quantum dots). Special attention will also be paid to analysis of influence of high temperature processing, namely thermal annealing and/or oxidation, which may be used for improving the quality of the layers and their interfaces, but also – for obtaining 3D quantum dots embedded in dielectric layer.

Fabricated, within the scope of this project structures will be studied mainly be means of electrical characterization methods of purposely designed test structures. Careful analysis of voltage-current and capacitance-voltage characteristics, measured under within wide range of temperatures and frequencies, using appropriate theoretical models, we will derive information among others on: mechanisms of charge carriers transport, their mobility, density and localization (in space and energy) of traps and other uncompensated charges, resistivity to voltage stresses and breakdown effects.

Particular attention will be paid to screening on the measured electrical characteristics the effects related with resonant tunneling, Coulomb blockade, presence of quantum dots and charging/discharging of traps (which can be applied for nano-flash memories).

Other methods (mainly: spectroscopic ellipsometry, HRTEM, SIMS and XPS) will be used to analyze composition and structure of the Si layers in order to correlate changes of these properties (e.g. resulting from medium- and high – temperature processing) with electrical behavior of characterized test structures.

Hence, accumulation of knowledge on the possible fields of application of PECVD ultrathin silicon layers to manufacturing of nanoelectronic devices will become inevitable result of this project.

On the other hand, the scale of possible variability of electrophysical properties of these layers themselves, as well as of structures based on them will allow for more realistic modeling and simulation of novel nanodevices electrical behavior, thus allowing quicker progress in theoretical works and design of such devices.

As a result, knowledge and skills acquired within the scope of this project may shorten significantly the time between demonstrators and commercial production of silicon based nanoelectronic structures. Thus, the results achieved during this project will be of great interest not only for scientific community, but also, in longer term, by industry.

[Pro40] **The conditions of short-wavelength emission excitation in optically active low-phonon glasses and composite materials pumped with pressure-tuned laser diodes** (Warunki wzbudzania emisji krótkofalowej w aktywnych optycznie szkłach niskofonowych i materiałach kompozytowych pompowanych przestrajalnymi ciśnieniowo diodami laserowymi), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Ryszard Piramidowicz, August 2012–February 2015

Short-wavelength radiation, typically understood as near-UV, violet up to blue-green, is important to many aspects of life, society, and technology. As such it has been addressed often in science and technology in the past several decades. Noncoherent short-wavelength radiation, starting at about 100 nm is present in sunlight, although due to absorption in upper atmosphere, very little reaches Earth's surface. The so-called black lights, or Wood light (filtered broadband radiation of e.g. $SrB_4O_7:Eu^{2+}$) and mercury vapour fluorescent UV lamps are typically used for germicidal purposes. Gas-discharge lamps and flash lamps emitting incoherent, broadband radiation due to arc discharge in noble gas plasma, are used e.g. in special lighting, pumping of solid state lasers (including laser at the National Ignition Facility in the USA) or for stimulating or characterizing various biological processes. Better efficiency, longer lifetimes, faster on-off times, dimming capability, less heat generation, together with comparatively lower price, make wide band gap semiconductor light emitting diodes (LEDs) take over from lamp sources, specifically in areas like lighting (and exciting filtering phosphors), bio-imaging or biostimulating processes in medicine and life sciences.

The scientific goal of the project is investigation and versatile analysis of main physical mechanisms of shortwavelength emission and lasing in novel optical materials activated with selected rare-earth ions excited by unique infrared, pressure-

tuned laser diodes. Initial research enables formulation of the main hypothesis that careful choice of excitation combined with matrix properties and dopant concentration optimizations, allows controlling character and dynamics of upconversion processes, enabling to precisely tailor luminescent properties of the investigated materials. This applies specifically to vitroceramic composites and, being the most promising direction, polymers activated with rare earth nanocrystallites. As the final result we expect significant broadening and systematization of knowledge on up-conversion mechanisms (and specifically various types of energy transfers) shaping short-wavelength luminescent properties under IR excitation in low phonon glasses and composite materials. Wide lineup of investigated hosts and concentrations along with novel experimental approach based on unique, pressure-tuned diode laser excitation, is to yield new knowledge that would disturb technologies of photonic materials and devices.

[Pro41] **The effect of phosphorus on the electro-physical properties of dielectric layers produced by 4H-SiC thermal oxidation** (Wpływ fosforu na właściwości elektro-fizyczne warstw dielektryków wytwarzanych metodą termicznego 4H-Sic), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Krystian Król, March 2013–March 2016

The goal of the project is conducting research on possibility of influencing electrical parameters of metal-oxide-semiconductor structure on silicon carbide (SiC) by introducing additional elements to interface region of this structure. The main hypothesis of planed research is that electrical properties of thermal oxides obtained on silicon carbide can be improved (especially by decreasing interface density of states Dit) by introducing phosphorus to transition region of MOS structure using shallow ion implantation. This technology can be beneficial for understanding oxidation process of silicon carbide. By performing chemical, and electrical research of prepared samples an effect of phosphorus incorporation will be described. As a result an explanation of mechanisms responsible for observed phenomenon will be proposed. A secondary goal of this project is developing optimal technological steps with respect to electrical properties of MOS structure using thermal dielectric on SiC with special consideration of interface density of states.

4.5. Projects Granted by International Institutions

[Pro42] **THIN but Great Silicon 2 Design Objects** (Układy scalone CMOS w technologii ultra-cienkiego krzemu (THIN but Great Silicon 2 Design Objects)), EU project, ENIAC, project leader: Wiesław Kuźmicz, co-workers: Elzbieta Piwowarska, Zbigniew Jaworski, September 2014–December 2017

THINGS2DO is focused on building the Design & Development Ecosystem for FD-SOI-technology. This technology is uniquely positioned to take advantage of some very distinct strengths of the European Semiconductor Industry. The design/development ecosystem is based on 3 pillars:

- EDA – design automation is the basis to perform complex design creation and porting tasks;
- IP – availability of pre-designed building blocks is an absolute must for any emerging technology;
- Services – are a combination of IP and EDA-tooling. There is a rich mix of SMEs in Europe focused on this topic, providing service offerings to bring the innovative potential of FD-SOI.

5. DISSEMINATION OF KNOWLEDGE

5.1. Students Scientific Associations

5.1.1. Students Scientific Association of Microelectronic and Nanoelectronics (KNMiN) (Koło Naukowe Mikroelektroniki i Nanoelektroniki KNMiN)

Association Tutor: Mateusz Śmietana, Ph.D., D.Sc.
Members of the Board: Anna Katarzyna Dębowska, Dariusz Burnat, Bartosz Michalak, Konrad Sośnicki
Total number of Members: 43

In the interests of the Students Scientific Group of Microelectronics and Nanoelectronics are issues mainly related to the technology, design instruments, characterization and application of new materials in the field of optoelectronics and microelectronics. Examples of topics dealt with by the members of the Student Scientific Associacion: preparation and characterization of semiconductor structures, the organization of trips to conferences, workshops and symposia (where group members can get acquainted with the latest achievements in the field of micro-, nano- and optoelectronics, meetings of eminent personalities from the world of modern science and to present the results of their own research).

Activities of KNMiN members in 2015:

Realized projects:
- "Improved functionality of screens of mobile devices with thin–films", 04–09.2015, Founds of Student Union of University of Technology.
- "Electrochemical biosensors with optically transparent metal oxide thin films", 06–12.2015, Founds of Rector of Warsaw University of Technology.

Exhibitions:
- Exhibitor at 2nd European University Festival, 07.02.2015, International European School, Warsaw.
- Poster presentation at conference of project "Development of Warsaw University of Technology Faculty of Electronics and Information Technology and establish a network of teaching laboratories", 15.09.2015, Warsaw University of Technology.
- Exhibitor at 19th Warsaw Science Festival, 26.09.2015, Warsaw University of Technology.
- Exhibitor at 6th Mazovia Development Forum, 7.10.2015, National Stadium, Warsaw.
- Exhibitor at Scientific Circles' and Students Organizations' Fair "KONIK", 28–29.10.2015, Warsaw University of Technology.

Achievements:
- 3rd prize in the competition for the best exhibitors at Scientific Circles' and Students Organizations' Fair "KONIK", 28–29.10.2015, Warsaw University of Technology.

Publications of KNMiN members in 2015 in journals:

1. Dominik, M., M. Śmietana, Król K., "Investigation of silicon nitride and DLC thin films hardness deposited with RF PECVD method", Elektronika: konstrukcje, technologie, zastosowania, 56.11: 35–38 (2015).
2. Taube A., Kamińska E., Kozubal M., Kaczmarski J., Wojtasiak W., Jasiński J., Borysiewicz M. A., Ekielski M., Juchniewicz M., Grochowski J., Myśliwiec M., Dynowska E., Barcz A., Prystawko P., Zając M., Kucharski R. and Piotrowska A., „Ion implantation for isolation of AlGaN/GaN HEMTs using C or Al", Physica Status Solidi A, 212: 1162–1169 (2015).
3. Myśliwiec M., Kisiel R., "Thermal and mechanical properties of sintered Ag layers for power module assembly", Microelectronics International, 32.1: 37–42 (2015).
4. Myśliwiec M., Kisiel R., Guziewicz M., „Material and technological aspects of high-temperature SiC device packages reliability", Microelectronics International, 32.3: 143–148 (2015).
5. Wzorek M., Czerwiński A., Borysiewicz M., Gołaszewska-Malec K., Myśliwiec M., Ratajczak J., Piotrowska A., Kątcki J., „Amorphous Ni-Zr Layer Applied for Microstructure Improvement of Ni-Based Ohmic Contacts to SiC", Materials Science and Engineering B, 199: 42–47 (2015).

5.1.2. Student Scientific Association of Optoelectronics (KNO) (Koło Naukowe Optoelektroniki KNO)

Association Tutor: Ryszard Piramidowicz, Ph.D, D.Sc.
Members of the Board: Bartosz Janaszek, Marcin Kieliszczyk, Radosław Piekarski
Total number of Members: 12

Student Association of Optoelectronics formally started in May 2006, however, the custom of nonobligatory student seminar meetings – foundation of our Association – has been successfully continued since 2002. Presently, the Association consists of students and Ph.D. students of Institute of Microelectronics and Optoelectronics, however graduate professionals complement our ranks, as well.

Main scientific interest:

- Fiber lasers and amplifiers
- Photonic Integrated Circuits
- Special optical fibers and fiber components
- New optically active materials for light sources (polymers, composites, glasses an nanocrystals doped with Rare Earth ions)

The goals of Student Optoelectronics Division:

- becoming more knowledgeable and research interests developing of Division's members,
- popularization of optoelectronics and photonics technology disciplines,
- conducting research and development work introducing Division's members to the character of scientific work,
- support of diverse forms of activity leading to the development of Division members' professional skills.

Activities of KNO members in 2015:

Inspired by the research conducted in 1987 by Kashyap R. and Blow K. J. from the British Telecom Research Laboratories, students of the KNO successfully applied for the scientific grant awarded by the rector of the Warsaw University of Technology, which constituted a major achievement for the Association in 2015. The project titled "Fiber fuse effect – examination and elaboration of the demonstrator" drew attention of one of the polish telecom providers due to potential danger that can result from the occurrence of the fiber fuse effect.

Publications of KNO members in 2015 in journals:

1. Anders K., Andrejuk P., Siejak E., Bercha A., Trzeciakowski W. A., Piątkowski D., Piramidowicz R., "Upconversion phenomena in oxide and fluoride glasses doped with erbium", IWASOM – The Fifth International Workshop on Advanced Spectroscopy and Optical Materials, Gdańsk, POLAND
2. Anders K., Krysiński R., Seddon A., Benson T., Sujecki S., Piramidowicz R., "Dysprosium-doped low phonon glasses for application in MIR light sources", The Fifth International Workshop on Advanced Spectroscopy and Optical Materials, 2015, Gdańsk, POLAND
3. Anders K., Krysiński R., Seddon A., Benson T., Sujecki S., Piramidowicz R., "Luminescent properties in mid infra-red of dysprosium doped chalcogenide fibers", 16th Conference on Optical Fibers and Their Applications, XVI Konferencja Światłowody i ich zastosowanie, KEiT PAN, 2015, Nałęczów, POLAND
4. Anders K., Krysiński R., Seddon A., Benson T., Sujecki S., Piramidowicz R., "New materials for MIR lasers and amplifiers", III Symposium of the Photonics Society of Poland combined with 3rd International Trade for Optoelectronics and Photonics OPTONexpo, 2015, Warszawa, POLAND
5. Bortnowski P., Anders K., Teodorczyk M., Dąbrowska E., Maląg A., Piramidowicz R., "Fiber-optic combiner for application in high power LD systems", 16th Conference on Optical Fibers and Their Applications, XVI Konferencja Światłowody i ich zastosowanie, Nałęczów, POLAND
6. Laskownicki M., Jusza A., Anders K., Klimczak M., Malinowski M., Piramidowicz R., "Short-wavelength luminescent properties of holmium doped ZBLAN glasses", IWASOM – The Fifth International Workshop on Advanced Spectroscopy and Optical Materials, Gdańsk, POLAND

5.1.3. Students Scientific Association of Microsystems (ONYKS) (Koło Naukowe Mikrosystemów ONYKS)

Association Tutor: Jakub Jasiński, Ph. D.
Members of the Board: Grzegorz Bernat, Krzysztof Skwieciński, Alan Rashid
Total number of Members: 20

The members of the Students Scientific Association are involved in the implementation of various projects (analog, microcontrollers, FPGAs) and have necessary tools to accomplish circuit boards. The scientifict interest also includes popularization of electronics among the youth and students. Activities of KNO members in 2015:

In 2015 Students Scientific Association took part in the following events:

- XVIII Festival of Science organized by Polish Academy of Sciences in Jabłonna: organized "Soldering school" – which enjoys enormous popularity (visitors soldered more than 100 sets).
- Warsaw University of Technology Open Days 2014: Students Scientific Association organized the workshop on techniques of soldering.

ONYKS has realized the following projects:

- **PowerGEO**,
  This is a tracking device system. In case someone wants to steal our bike, module sends us a message, along with our bike's position(in case it has already changed). Thanks to that we can quickly react and catch the thief. The main aim of the project was to build a complete device with many smart technologies. PowerGEO contains numerous modules such as GPS/GLONASS, Bluetooth Low Energy, GSM and MEMS sensors.
- **Construction of rocket's on-board computer.**
  The aim of the project was to build a complete computer to control a rocket. The device consists of a module with 3 MEMS sensors for data synthesis, parachute control system and a SD card to storage data.
- **Shannon's Ultimate Machine**
  The aim of the project was to learn programming in C and improve skills in digital systems. The device consists of: wooden box, servomotor and PCB module with Arduino. It is merely a small wooden box, with a single switch on one face. When you throw the switch, there is an anger. The lid slowly rises, and from beneath it emerges a hand. The hand reaches down, turns the switch off and retreats into the box. With the finality of a closing box, the lid snaps shut and peace reigns once more.
- **Maze Game**
  The aim of the project was to learn programming in C and improve skills with Arduino. The device consists of PCB module with Arduino and normal wooden maze with small ball inside. User changes the slope of maze surface by joystick and ball's run track. This device attracted great interest of children at Festival of Science in Jabłonna.

5.1.4. Student Scientific Association of Integrated Systems (Koło Naukowe Systemów Scalonych)

Association Tutor: Marek Niewiński, Ph. D.
Members of the Board: Piotr Borowy, Bartosz Dec, Mikołaj Pałgan
Total number of Members: 20

Student Association of Integrated Systems was registered in end April 2015. The main areas of interest are: developing mixed analog-digital system using PSOC board, designing extension board for PSOC, programming microcontrollers and Integrated Circuit design.

Project realized in 2015 by association's members:

Reconfigurable wireless data acquisition system using the PSOC The main aim of this project was build universal data acquisition system which consist of:

- dedicated hardware board with input ports, amplifiers, filters, A/D converters, communication ports,
- wi-fi extension board,
- dedicated software implemented in microcontroller,
- dedicated multisystem PC software.

Dedicated software allows users of system to remotely change the main parameters of acquisition block such as A/D resolution and sampling rate, gain of amplifiers etc.

Publications of association's members in 2015:

Programowe śledzenie danych nawigacyjnych w scalonym odbiorniku GNSS (Sofware tracking of navigation data in integrated GNSS receiver) – Prace Studenckich Kół Naukowych Tom 2 – praca zbiorowa pod redakcją Andrzeja Jakubiaka, Oficyna Wydawnicza Politechniki Warszawskiej

5.2. Cooperation with schools

In 2015 the Institute of Microelectronics and Optoelectronics actively participated in various forms of the popularization of science and knowledge among high school students. The main objective of this activity was to present the fields of science and technology represented by our Institute and thus encourage young people to study them.

Within the Wszechnica projects our scientists gave several lectures (Jan Smidt, Piotr Firek – "Nanoworld – the reality and dreams", Ryszard Piramidowicz – "Laser – light with unusual properties," Robert Mroczyński – "How to make a chip"). Several demonstrations were organized in IMiO's advanced laboratories (Semiconductor Technology lab, Photonics lab, Photovoltaics lab, IC Design lab, Image Processing labThe Wszechnica project is managed by Slawomir Szostak.

IMiO participated in the Science Festival delivering several lectures and organizing a stand to demonstrate various research fields with great help from the students belonging to Microsystems ONYKS, Microelectronics and Nanoelectronics, and Optoelectronics Research Groups

5.3. Fiber-Optic Photonics Platform (FOPP) Polska Platforma Fotoniki Światłowodowej (PPFŚ)

Coordinator:
Ryszard Piramidowicz, Ph.D, D.Sc.
Warsaw University of Technology, Institute of Microelectronics and Optoelectronics

Consortium members:
Warsaw University of Technology (PW)
Bialystok University of Technology (PB)
Institute of Electronic Materials Technology (ITME)
Marie Curie-Sklodowska University (UMSC)
West Pomeranian University of Technology (ZUT)

Timeline: 2014–2018

The fundamental research objective of the Platform is to develop novel, innovative solutions for broadly understood optical fibers photonics, including such focus areas as sources and amplifiers of coherent and incoherent radiation, passive and active optical fibers of specially designed optical properties, micro-and nano-structured (including PCF) fibers for special applications, optical fiber sensors, micro and nano-optical elements and components.

The Platform is based on five pillars:

1) modeling and design,
2) fabrication technology,
3) characterization,
4) development and prototyping,
5) validation and testing constituting the complete food-chain of the manufacturing process.

Technological competences, indispensible for such a project, are offered by three main players on the Polish market of the fiber-optic technology: the Institute of Electronic Materials Technology (ITME), the Bialystok Technical University (PB) and the Marie Curie-Sklodowska University (UMCS). The design, characterization and prototyping capabilities are disposed by the three research groups of the Warsaw University of Technology (PW), while the validation and testing issues are covered mainly by West Pomeranian University of Technology (ZUT) and Warsaw University of Technology (PW). The combined potential of the platform's partners enables undertaking of practically all kinds of research and development work within the area of fiber-optic photonics and also significant involvement in the research within the field of planar/strip waveguide-based integrated structures. The main fields of interest are a result of up-to-now conducted projects (both fundamental research and R&D works), present expertise of partners and continuously monitored and anticipated demands of the market.

The core of the consortium consists of photonics fiber laboratories situated at the Warsaw University of Technology supported by technological laboratories of the main Polish manufacturers of specialty optical fibers (ITME, UMCS, PB). Infrastructure is complemented by testbeds of photonic systems offered by PW and ZUT. It is worth pointing out that the consortium members already have a unique infrastructure at their disposal and have technological ability and technical skills for manufacturing the sophisticated fiber-optic elements, successfully competing on the global market with the products of the most significant commercial manufacturers. Good examples are microstructed silica and polymer fibers developed at UMCS and systematically purchased by leading European research institutes and companies and nano-structured graded index lenses and microscope objectives

5.4. Photovoltaic Platform, Warsaw University of Technology (PVP) Platforma Fotowoltaiki Politechniki Warszawskiej (PF)

Coordinator:
Ryszard Piramidowicz, Ph.D, D.Sc.
Warsaw University of Technology, Institute of Microelectronics and Optoelectronics

The Photovoltaic Platform was established in 2014 at Warsaw University of Technology in order to increase utilization of the scientific potential and encouraging industry-oriented research services. The Photovoltaic Platform aims to bring together complementary competences of various research groups throughout University creating strong multidisciplinary photovoltaic group capable of successful realization of both large research projects and development of complete solutions for the industry partners. The Photovoltaic Platform core consists of teams from the Faculty of Electronics and Information Technology and Faculty of Physics, as well as teams from other faculties involved in research on various aspects of photovoltaic technologies.

Range of competences of the gathered research groups covers all levels of photovoltaics – from physics of the solar cells, structure of modules, inverters and mounting large methods, design, development and performance evaluation of photovoltaic systems up to energy profiles prediction and assessment of grid integration issues. The teams also help prospective investors to evaluate their model of engagement in the photovoltaic market, taking into consideration technical challenges, legal environment and economic feasibility.

Cooperation with industry partners is critical for long term development of photovoltaics at the Warsaw University of Technology. The Photovoltaic Platform cooperates closely with a number of large utility companies interested in taking part in expected rapid photovoltaic market development. The platform prepared concept study and design of test photovoltaic system for utility company. It also conducts quality assessment of small photovoltaic systems prepared by local installer companies to ensure all systems installed under utility supervision meet highest industry standards. The Photovoltaic Platform also conducted detailed performance analysis of a medium scale photovoltaic power plant installed by a utility company and detected design and installation flaws that explained lower then expected power output. Uniqueness of Photovoltaic Platform experts' competences was also underlined with participation in development of large scale thin-film photovoltaic modules factory concept for one of the largest Polish companies. The Photovoltaic Platform also assists the BOS Foundation in dissemination of knowledge on distributed prosumer energy sources.

Broad knowledge of polish photovoltaic market development provides the Photovoltaic Platform basis for further development of competences of the photovoltaic teams at Warsaw University of Technology in connection with identified needs of the industry. In parallel with involvement in the cooperation with business partners the Photovoltaic Platform teams remain engaged in a number of research project.

Electronic Materials and Microsystem Technology Division

6. DEGREES AWARDED

6.1. Ph.D. Degrees

[PhD1] Jakub Jasiński, **Modeling of admittance characteristics of MIS tunnel structures (metal-insulator-semiconductor)** (Modelowanie charakterystyk admitancyjnych tunelowych struktur MIS (metal-izolator-półprzewodnik)), supervisor: Lidia Łukasiak, 8 May 2015

[PhD2] Krystian Król, **Dielectrics produced by thermal methods in silicon carbide for MOS semiconductor devices** (Dielektryki wytwarzane metodami termicznymi na potrzeby technologii przyrządów półprzewodnikowych typu MOS w węgliku krzemu), supervisor: Jan Szmidt, 8 December 2015

[PhD3] Kinga Kurowska, **Advanced studies models for management of academic institution** (Modele studiów zaawansowanych w zarządzaniu instytucją akademicką), supervisor: Jerzy Woźnicki, 27 October 2015

[PhD4] Arkadiusz Łuczyk, **Minimizing of power consumption in the processor with a superscalar architecture SMOVE** (Minimalizacja poboru mocy w procesorze o superskalarnej architekturze przesłań SMOVE), supervisor: Witold Pleskacz, 3 December 2015

[PhD5] Krzysztof Madziar, **Optimization of operation conditions and modeling of microwave oscillators with analog optical link** (Optymalizacja warunków pracy i modelowanie oscylatorów mikrofalowych pracujących z analogowym łączem optycznym), supervisor: Bogdan Galwas, 12 May 2015

[PhD6] Michał Staniewski, **Vertical Slit Transistor based Integrated Circuit** (Analiza i modelowanie tranzystora polowego złączowego jako elementu układów VeSTIC), supervisor: Andrzej Pfitzner, 1 December 2015

6.2. M.Sc. Degrees

[MSc1] Piotr Bieliński, **Characterization of ultra-thin hafnium dioxide layers fabricated by different methods for double-barrier structures** (Charakteryzacja ultracienkich warstwtlenku hafnu wytwarzanych różnymi metodami i ich wykorzystanie w realizacji struktur dwubarierowych), advisor: Romuald Beck, 16 October 2015

[MSc2] Igor Butryn, **Implementation of phase locked loop for Bluetooth receiver in UMC CMOS 130 nm technology** (Implementacja pętli synchronizacji fazy do odbiornika Bluetooth w technologii UMC 130 nm), advisor: Tomasz Borejko, 3 July 2015

[MSc3] Maciej Domosud, **Analysis of upconversion mechanisms in biphasic eutectic erbium doped YbAG crystals** (Analiza procesów konwersji wzbudzenia w dwufazowych kryształach eutektycznych YbAG domieszkowanych jonami erbu), advisor: Marcin Piotr Kaczkan, 20 March 2015

[MSc4] Damian Drewulski, Łukasz Hołownia, **Mobile application for creating spherical panoramas** (Mobilna aplikacja do worzenia panoram sferycznych), advisor: Marek Sutkowski, 10 April 2015

[MSc5] Marta Filipowicz, **Investigations of optical properties of multicore erbium doped fibre** (Badanie właściwości optycznych światłowodu wielordzeniowego domieszkowanego jonami erbu), advisor: Ryszard Piramidowicz, 23 October 2015

[MSc6] Aleksandra Golba, **Optical characterization of praseodymium doped Al2O3 nanocrystals in the visible spectral range** (Badanie właściwości luminescencyjnych w zakresie widzialnym nanokryształów Al_2O_3 domieszkowanych jonami prazeodymu), advisor: Ryszard Piramidowicz, 11 September 2015

[MSc7] Piotr Gromada, **PSoC integrated systems for medical diagnostics – analysis of ECG signal** (Systemy zintegrowane PSoC w diagnostyce medycznej – analiza sygnału EKG), advisor: Zbigniew Jaworski, 16 October 2015

[MSc8] Rafał Hołyński, **Analysis of parameters of photovoltaic systems with fixed tilt and tracking plane** (Analiza porównawcza pracy systemów fotowoltaicznych o ustalonej ekspozycji i nadążnego), advisor: Stanisław Pietruszko, 16 October 2015

[MSc9] Maciej Kamiński, **Fabrication ISFET transistors with TiO_2 gate oxide** (Wytwarzanie tranzystora ISFET z zastosowaniem TiO_2 w roli dielektryka bramkowego), advisor: Piotr Firek, 11 September 2015

[MSc10] Agnieszka Klimas, **The project of measuring system for testing selected mechanical parameters of overhead conductors** (Projekt systemu pomiarowego do badania wybranych parametrów mechanicznych przewodów napowietrznych), advisor:Sławomir Szostak, 2 October 2015

[MSc11] Michał Luśnia, **MOS structure's electrical parameters extractor** (Ekstraktor parametrów elektrycznych struktury metal--izolator-półprzewodnik), advisor: Bogdan Majkusiak, 20 March 2015

[MSc12] Kamil Malec-Kruszyński, **Lossy and lossless compression of 3D images** (Kompresja stratna i bezstratna obrazów 3D), advisor:Marek Sutkowski, 26 June 2015

[MSc13] Maciej Moskala, **Functional verifcation of Bluetooth Low Energy controller** (Weryfikacja funkcjonalna kontrolera Bluetooth Low Energy), advisor: Witold Pleskacz, 16 October 2015

[MSc14] Michał Pawłowski, **PSoC integrated systems for medical diagnostics – implementation of tachycardia detection algorithm** (Systemy zintegrowane PSoC w diagnostyce medycznej – implementacja algorytmu detekcji tachykardii), advisor: Zbigniew Jaworski, 20 March 2015

[MSc15] Kamil Piekoszewski, **Hardware implementation of ST elevation myocardial infarction diagnosis algorithm** (Sprzętowa realizacja algorytmu diagnozy zawału STEMI), advisor: Elżbieta Piwowarska, 20 March 2015

[MSc16] Andrzej Połatyński, **Dual-polarization coherent receiver with integrated tunable local oscillator based on a polymer integration platform** (Dwu-polaryzacyjny koherentny odbiornik ze zintegrowanym przestrajalnym oscylatorem lokalnym wykonany w platformie polimerowej), advisor: Paweł Szczepański, 23 October 2015

[MSc17] Mateusz Słowikowski, **Technology of fiber-optic power combiners manufacturing** (Technologia wytwarzania światłowodowych sumatorów mocy optycznej), advisor: Ryszard Piramidowicz, 20 March 2015

[MSc18] Tomasz Stańczyk, **Simulation and analysis of properties of metal-dielectric metamaterial structures** (Symulacje i analiza właściwości struktur metamateriałowych typu metal-dielektryk), advisor: Janusz Parka, 3 July 2015

[MSc19] Arkadiusz Szydlik, **Investigation of fiber coupled mid- and long-wavelenght infrared detectors** (Badanie średnio- i długo-falowych detektorów podczerwieni ze sprzężeniem światłowodowym), advisor: Ryszard Piramidowicz, 18 December 2015

[MSc20] Łukasz Wiechowski, **Design of GFSK Demodulator for Bluetooth receiver in UMC CMOS 130nm technology** (Projekt demodulatora GFSK dla odbiornika Bluetooth w technologii UMC CMOS 130 nm), advisor: Tomasz Borejko, 19 June 2015

6.3. B.Sc. Degrees

[BSc1] No Ah, **Research of scattering status of single titanium layer and thicknesses of titanium and nickel multilayer prepared by electron-beam method**, advisor: Aleksander Werbowy, 20 March 2015

[BSc2] Piotr Boguszewicz, **Implementation of microwave low noise amplifier (LNA) for the K band in BiCMOS 130 nm technology** (Implementacja mikrofalowego wzmacniacza niskoszumnego (LNA) na pasmo K w technologii BiCMOS 130 nm), advisor: Tomasz Borejko, 18 September 2015

[BSc3] Paweł Bortnowski, **Pumping module for medium power fiber laser** (Moduł pompujący do lasera światłowodowego średniej mocy), advisor: Ryszard Piramidowicz, 30 September 2015

[BSc4] Andrzej Brzus, **Medical Data Management System** (System zarządzania bazą danych medycznych), advisor: Mikołaj Baszun, 11 September 2015

[BSc5] Dariusz Burnat, **Fabrication and characterization of fiber-optic structures with thin titanium dioxide coatings for liquid sensing applications** (Wytwarzanie i charakteryzacja światłowodowych struktur z cienkim pokryciem tlenku tytanu na potrzeby badania cieczy), advisor: Mateusz Jakub Śmietana, 18 September 2015

[BSc6] Kamil Dziarczykowski, **Measurement of the current-voltage curves of photovoltaics modules and setup of the measurement system** (Pomiar charakterystyk prądowo-napięciowych modułów fotowoltaicznych i przygotowanie stanowiska pomiarowego), advisor:Michał Malinowski, 3 July 2015

[BSc7] Ivan Dziemianczyk, **Digital Image Correlation using GPU Computing** (Cyfrowa korelacja obrazów z wykorzystaniem układów GPU), advisor: Piotr Garbat, 20 February 2015

[BSc8] Mariusz Gazda, **Implementation of program supporting logic simulations of multi-clock, asynchronous systems at gate level** (Implementacja programu wspomagającego symulacje logiczne układów wielozegarowych, asynchronicznych na poziomie bramek cyfrowych), advisor: Arkadiusz Władysław Łuczyk, 16 October 2105

[BSc9] Bartłomiej Grzybowski, **LED display driver design and implementation** (Projekt i realizacja sterownika tablic zbudowanych na diodach LED), advisor: Sławomir Szostak, 2 October 2015

[BSc10] Aleh Halauko, **Implementation of low noise amplifier (LNA) for the GNSS applications in FD-SOI 28 nm technology** (Implementacja wzmacniacza niskoszumnego (LNA) do odbiornika sygnałów nawigacji satelitarnej (GNSS) w technologii FD-SOI 28 mm), advisor: Tomasz Borejko, 25 September 2015

[BSc11] Jayoung Hwang, **Technology and characterization of MOSFETs with high-k gate dielectric layers** (Technologia i charakteryzacja struktur MOSFET z dielektrykiem bramkowym o wysokiej wartości przenikalności elektrycznej), advisor: Robert Paweł Mroczyński, 20 March 2015

[BSc12] Bartosz Janaszek, **Generation of ultra-short pulses in planar lasers using graphene as a nonlinear absorber** (Generacja superkrótkich impulsów w laserach planarnych wykorzystujących grafen jako nieliniowy absorber), advisor: Paweł Szczepański, 20 February 2015

[BSc13] Karolina Kozłowska, **Development of graphical user interface (GUI) for analysis of the waveguide diffraction gratings** (Opracowanie środowiska graficznego (GUI) do analizy falowodowych siatek dyfrakcyjnych), advisor: Anna Tyszka-Zawadzka, 27 February 2015

[BSc14] Rafał Krawczyk, **Implementation of library in C to decode navigation messages from GPS and Galileo satellites for an integrated GNSS receiver** (Implementacja biblioteki języka C do dekodowania wiadomości nawigacyjnych z satelitów systemów Galileo i GPS dla scalonego odbiornika GNSS), advisor: Tomasz Borejko, 25 September 2015

[BSc15] Rafał Krysiński, **Test bench for investigating spectral parameters of optical fibers in mid infrared spectral range** (Stanowisko do badań parametrów spektralnych włókien światłowodowych w zakresie średniej podczerwieni), advisor: Ryszard Piramidowicz, 20 February 2015

[BSc16] Sanghwa Lee, **Electrical Characterization of GaN – HEMTs** (Elektryczna charakteryzacja tranzystorów HEMT z azotku galu), advisor: Lidia Łukasiak, 20 March 2015

[BSc17] Tomasz Łazarczyk, **Graphical user interface implementation for visualization of user geographical position, the satellites orbital positions and onboard time, errors and the quality of signal reception for the integrated circuit 7GNSS receiver** (Implementacja aplikacji graficznej do wizualizacji pozycji geograficznej, pozycji orbitalnych satelitów, czasu pokładowego, błędów oraz jakości odbioru sygnału dla scalonego odbiornika GNSS), advisor: Tomasz Borejko, 25 September 2015

[BSc18] Dominik Malinowski, **Measuring setup for characterization of persistent luminescence materials** (Stanowisko do badań materiałów o przedłużonej luminescencji), advisor: Ryszard Piramidowicz, 10 February 2015

DEGREES AWARDED

[BSc19] Michał Mroczek, **Network for Warsaw academic community – design and implementation, and network development suggestions** (Projekt i wdrożenie sieci metropolitalnej dla środowiska akademickiego Warszawy wraz z propozycjami rozwoju sieci), advisor: Krzysztof Michał Madziar, 16 October 2105

[BSc20] Sławomir Nieściur, **Blowfish cryptographic algorithm implementation in SystemC** (Implementacja algorytmu kryptograficznego Blowfish w SystemC), advisor: Elżbieta Piwowarska, 19 June 2015

[BSc21] Krzysztof Nowakowski, **Subtitle editor using "SubStation Alpha" file format** (Edytor napisów wykorzystujący format skryptów "SubStation Alpha"), advisor: Piotr Witoński, 2 October 2015

[BSc22] Radosław Piekarski, **Mode-locking in fiber laser using graphene as a saturable absorber** (Synchronizacja modów w laserze włóknowym wykorzystującym grafen jako nieliniowy absorber), advisor: Paweł Szczepański, 20 February 2015

[BSc23] Piotr Pytkowski, **The measurements of diffraction efficiency of SS(A)FLC structures** (Pomiary wydajności dyfrakcyjnej struktur SS(A)FLC), advisor: Marek Sutkowski, 27 February 2015

[BSc24] Bartłomiej Wawrzyniuk, **Set up of a station with a prototype platform CPU/DSP** (Uruchomienie stanowiska z platformą prototypową CPU/DSP), advisor: Marek Sutkowski, 25 September 2015

[BSc25] Kamil Wereszczyński, **The project of precise two-channel digital supply power unit** (Projekt i realizacja cyfrowego zasilacza laboratoryjnego), advisor: Sławomir Szostak, 13 February 2015

[BSc26] Krzysztof Wrotkowski, **Development of hardware and software for computer controlled voltage source for laboratory application** (Opracowanie i oprogramowanie sterowanego mikroprocesorem źródła napięciowego do zastosowań laboratoryjnych), advisor: Jan Gibki, 20 February 2015

[BSc27] Michał Wysocki, **The electrical scheme design of the transmitter implementing the physical layer of RS-485 standard** (Projekt schematu elektrycznego układu wyjścia realizującego warstwę fizyczną standardu RS-485), advisor: Witold Pleskacz, 25 September 2015

[BSc28] Aleksandra Żyniewicz, **Luminescent properties of dysprosium doped nanopowders** (Badanie właściwości luminescencyjnych nanoproszków domieszkowanych jonami dysprozu), advisor: Ryszard Piramidowicz, 3 July 2015

7. PUBLICATIONS

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

NUMBER	JOURNAL	AUTHORS	TITLE	DOI	VOLUME	PAGES
[Pub1]	Journal of the Optical Society of Korea	Bogdanowicz R., Sobaszek M., Ficek M., Gnyba M., Ryl J., Siuzdak K., Bock W., Śmietana M.	Opto-Electrochemical Sensing Device Based on Long-Period Grating Coated with Boron-Doped Diamond Thin Film	10.3807/JOSK.2015.19.6.705	vol. 19 no. 6	705–710
[Pub2]	Diamond and Related Materials	Bogdanowicz R., Sobaszek M., Ryl J., Gnyba M., Ficek M., Gołuński Ł., Bock W., Śmietana M., Darowicki K.	Improved surface coverage of an optical fibre with nanocrystalline diamond by the application of dip-coating seeding	10.1016/j.diamond.2015.03.007	vol. 55	52–63
[Pub3]	Biosensors & Bioelectronics	Brzozowska E., Śmietana M., Koba M., Górska S., Pawlik K., Gamian A., Bock W.,	Recognition of bacterial lipopolysaccharide using bacteriophage-adhesin-coated long-period gratings	doi.org/10.1016/j.bios.2014.07.027	vol. 67	93–99
[Pub4]	Applied Physics Letters	Carvalho N., Le Floch J., Krupka J., Tobar M.	Multi-mode technique for the determination of the biaxial Y_2SiO_5 permittivity tensor from 300 to 6K	10.1063/1.4920987	vol. 106 no. 19 (192904)	1–4
[Pub5]	Liquid Crystals, Taylor&Francis	Chodorow U., Chojnowska O., Parka J.	Properties of two-component nematic liquid crystal mixtures in the range of 0.3–3.0 THz	10.1080/02678292.2015.1036816	vol. 42 no. 9	1243––1249
[Pub6]	Journal of Alloys and Compounds	Drozdowski W., Brylew K., Malinowski M., Turczyński S.	Scintillation properties of μPD-grown $Y_4Al_2O_9$: Pr (YAM: Pr) crystals	10.1016/j.jallcom.2015.01.274	vol. 632	816–821
[Pub7]	Applied Physics Letters	Dużyńska A., Taube A., Korona K., Judek J., Zdrojek M.	Temperature-dependent thermal properties of single-walled carbon nanotube thin films	10.1063/1.4919792	vol. 106 no. 18	1831081––1831085
[Pub8]	Materials Science-Poland, Politechnika Wrocawska	Firek P., Waśkiewicz M., Stonio B., Szmidt J.	Properties of AlN thin films deposited by means of magnetron sputtering for ISFET applications	10.1515/msp-2015--0095	vol. 33 no. 4	669–676
[Pub9]	Thin Solid Films	Gierałtowska S., Wachnicki Ł., Witkowski B., Mroczyński R., Dłużewski P., Godlewski M.	Characterization of dielectric layers grown at low temperature by atomic layer deposition	10.1016/j.tsf.2015.01.059	vol. 577	97–102
[Pub10]	Microelectronic Engineering, Elsevier BV	Jasiński J., Mazurak A., Mroczyński R., Majkusiak B.	Small-signal admittance model of multi-traps distributed over energy and space in the insulator of MIS tunnel structures	10.1016/j.mee.2015.04.100	vol. 147	349–353
[Pub11]	IEEE Journal of Quantum Electronics	Koba M., Szczepański P.	Analysis of Mode Competition in a 2-D Square Lattice Photonic Crystal Laser With Transverse Magnetic Polarization	10.1109/JQE.2015.2478596	vol. 51 no. 10	640021301 – 640021313
[Pub12]	Journal of Lightwave Technology	Koba M., Śmietana M., Brzozowska E., Górska S., Mikulic P., Bock W.,	Reusable Bacteriophage Adhesin-Coated Long-Period Grating Sensor for Bacterial Lipopolysaccharide Recognition	10.1109/JLT.2014.2364118	vol. 33 no. 12	2518––2523

[1] Institute for Scientific Information (Philadelphia, USA)

[Pub13]	Liquid Crystals, Taylor&Francis	Kowerdziej R., Stańczyk T., Parka J.	Electromagnetic simulations of tunable terahertz metamaterial infiltrated with highly birefringent nematic liquid crystal	10.1080/02678292.2014.1000406	vol. 42 no. 4	430–434
[Pub14]	Applied Physics Letters	Kowerdziej R., Jaroszewicz L., Olifierczuk M., Parka J.	Experimental study on terahertz metamaterial embedded in nematic liquid crystal	10.1063/1.4914032	vol. 106 no. 9	0929051––0929053
[Pub15]	Thin Solid Films	Król K., Sochacki M., Strupiński W., Racka K., Guziewicz M., Konarski P., Miśnik M., Szmidt J.	Chlorine-enhanced thermal oxides growth and significant trap density reduction at SiO_2/SiC interface by incorporation of phosphorus	10.1016/j.tsf.2015.08.028	no. 591	86–89
[Pub16]	Applied Physics Letters	Krupka J., Kamiński P., Kozłowski R., Surma B., Dierlamm A., Kwestarz M.	Dielectric properties of semi-insulating silicon at microwave frequencies	10.1063/1.4929503	vol. 107 no. 8 (082105)	1–3
[Pub17]	Measurement Science & Technology, IOP Science	Krupka J.	Measurements of the complex permittivity of highly concentrated aqueous NaCl solutions and ferrofluid employing microwave cylindrical cavities	10.1088/0957-0233/26/9/095702	vol. 26 no. 9	0957021––0957029
[Pub18]	AIP Advances	Mavrona E., Chodorow U., Barnes M., Parka J., Pałka N., Saitzek S., Blach J., Apostolopoulos V., Kaczmarek M.	Refractive indices and birefringence of hybrid liquid crystal – nanoparticles composite materials in the terahertz region	10.1063/1.4927392	vol. 5 no. 7	0771431––0771436
[Pub19]	Acta Physica Polonica A, Polish Academy of Sciences Institute of Physics	Michalak B., Koba M., Śmietana M.	Silicon Nitride Overlays Deposited on Optical Fibers with RF PECVD Method for Sensing Applications: Overlay Uniformity Aspects	12693/APhysPolA.127.1587	vol. 127 no. 6	1587––1590
[Pub20]	Journal of Vacuum Science & Technology B	Mroczyński R., Szymańska M., Głuszewski W.	Reactive magnetron sputtered hafnium oxide layers for nonvolatile semiconductor memory devices	10.1116/1.4906090	vol. 33 no. 1 (01A113)	1–5
[Pub21]	Microelectronics International	Myśliwiec M., Kisiel R., Guziewicz M.	Material and technological aspects of high-temperature SiC device packages reliability	10.1108/MI-01-2015-0009	vol. 32 no. 3	143–148
[Pub22]	Optical Materials	Myśliwiec M., Kisiel R.	Thermal and mechanical properties of sintered Ag layers for power module assembly	10.1108/MI-10-2013-0050	vol. 32 no. 1	37–42
[Pub23]	Journal of Crystal Growth	Racka K., Avdonin A., Sochacki M., Tymicki E., Grasza K., Jakieła R., Surma B., Dobrowolski W.	Magnetic, optical and electrical characterization of SiC doped with scandium during the PVT growth	10.1016/j.jcrysgro.2014.11.035	vol. 413	86–93
[Pub24]	Journal of Lightwave Technology	Stopiński S., Leijtens X., Smit M., Hoek M., Gajanana D., Kazmierski C., Piramidowicz R.	A Photonic-Integrated Transceiver for Data Readout Systems	10.1109/JLT.2015.2465154	vol. 33 no. 20	4278––4283
[Pub25]	RSC Advances	Szczodrowski K., Chruścińska A., Barzowska J., Przegiętka K., Anders K., Piramidowicz R., Grinberg M.	Influence of Ti^{4+} on the long lasting luminescence of $Sr_2SiO_4:Eu^{2+}$	10.1039/C5RA09999D	vol. 80 no. 5	65236––65244
[Pub26]	Physica Status Solidi A-Applications and Materials Science	Śmietana M., Koba M., Mikulic P., Bogdanowicz R., Bock W.	Improved diamond-like carbon coating deposition uniformity on cylindrical sample by its suspension in RF PECVD chamber	10.1002/pssa.201532226	vol. 212 no. 11	2496-2500

[Pub27]	Optics Express, Optical Society American	Śmietana M., Koba M., Brzozowska E., Krogulski K., Nakonieczny J., Wachnicki Ł., Mikulic P., Godlewski M., Bock W.	Label-free sensitivity of long-period gratings enhanced by atomic layer deposited TiO_2 nano-overlays	10.1364/OE.23.008441	vol. 23 no. 7	8441––8453
[Pub28]	Physica Status Solidi A-Applications and Materials Science	Taube A., Kamińska E., Kozubal M., Kaczmarski J., Wojtasiak W., Jasiński J., Borysiewicz M., Ekielski M., Juchniewicz M., Grochowski J., Myśliwiec M., Dynowska E., Barcz A., Prystawko P., Zając M., Kucharski R., Piotrowska A.	Ion Implantation for Isolation of AlGaN/GaN HEMTs Using C or Al	10.12916/przemchem.2014.XX	vol. 212 no. 5	1162––1169
[Pub29]	Solid-State Electronics, Elsevier	Taube A., Kaczmarski J., Kruszka R., Grochowski J., Kosiel K., Gołaszewska-Malec K., Sochacki M., Jung W., Kamińska E., Piotrowska A.	Temperature-dependent electrical characterization of high-voltage AlGaN/GaN-on-Si HEMTs with Schottky and ohmic drain contacts	10.1016/j.sse.2015.04.001	vol. 11	12–17

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

NUMBER	JOURNAL	AUTHORS	TITLE	DOI	VOLUME	PAGES
[Pub30]	Sensors & Transducers, IFSA	Borecki M., Korwin--Pawlowski M., Duk M., Kociubiński A., Frydrych J., Prus P., Szmidt J.	Dynamical Capillary Rise Photonic Sensor for Testing of Diesel and Biodiesel Fuel		vol. 193 no. 10	11–22
[Pub31]	Przegląd Elektrotechniczny, Sigma NOT	Borecki M., Kuca B., Kisielewicz T., Tarimer İ., Lysiak H.	Praktyki ochrony odgromowej napowietrznych linii średniegonapięcia z przewodami niepełnoizolowanymi		vol. 01/2015	70–72
[Pub32]	Elektronika – konstrukcje, technologie, zastosowania, Sigma NOT	Dominik M., Śmietana M., Król K.	Investigation of silicon nitride and DLC thin films hardness deposited with RF PECVD method	10.15199/13.2015.11.8	vol. 56 no. 11	35–38
[Pub33]	Materials Science Forum, Trans Tech Publications Ltd.	Król K., Sochacki M., Turek M., Żuk J., Borowicz P., Teklińska D., Konarski P., Miśnik M., Domanowska A., Michalewicz A., Szmidt J.	Influence of Phosphorus Implantation on Electrical Properties of Al/SiO_2/4H-SiC MOS Structure	10.4028/www.scientific.net/MSF.821-823.496	vol. 821–823	496–499
[Pub34]	Photonics Letters of Poland, Polskie Stowarzyszenie Fotoniczne	Parka J., Kłosowicz S.	16th Topical Meeting on the Optics of Liquid Crystals	10.4302/plp.2015.4.01	vol. 7 no. 4	90
[Pub35]	Przegląd Telekomunikacyjny – Wiadomości Telekomunikacyjne, SIGMA NOT	Pfitzner A., Kuźmicz W., Jaworski Z., Pleskacz W.	Systemy scalone – od zastosowań tradycyjnej technologii CMOS do najnowszych koncepcji FD-SOI oraz VESTIC	10.15199/59.2015.4.108	vol. 4	434–438
[Pub36]	Procedia Engineering, Elsevier BV	Weremczuk J., Piotrowski J., Kalinowski P., Kisiel R.	Flexible Coplanar Line of Low Heat Load to Cooled Infrared Detector	10.1016/j.proeng.2015.08.780	vol. 120	1183––1186

[Pub37]	International Journal of Innovation and Learning, Inderscience Publishers	Woźnicki J., Morawski R., Luterek M., Degtyarova I.	Benchmarking in Higher Education: Polish Experience	10.1504/IJIL.2015.067404	vol. 17 no. 2	147–161
[Pub38]	Politeja. Pismo Wydziału Studiów Międzynarodowych i Politycznych Uniwersytetu Jagiellońskiego	Woźnicki J.	Nauki o polityce publicznej – cztery lata rozwoju w symbiozie z politologią	10.12797/Politeja.12.2015.36.02	vol. 36 no. 4	9–25
[Pub39]	Forum Akademickie, Akademicka Oficyna Wydawnicza	Woźnicki J.	Rada Główna w minionym roku	10.1557/opl.2014.220	no. 1	36–37

7.3. Scientific and Technical Papers Published in Conference Proceedings

NUMBER	PROCEEDINGS OF CONFERENCE / ISBN/DOI	AUTHORS	TITLE	PAGES
[Pub43]	Book of Abstracts The Fifth International Workshop on Advanced Spectroscopy and Optical Materials, Uniwersytet Gdański	Anders K., Andrejuk P., Siejak E., Bercha A., Trzeciakowski W., Piątkowski D., Piramidowicz R.	Upconversion phenomena in oxide and fluoride glasses doped with erbium	48, O1
[Pub40]		Anders K., Krysiński R., Seddon A., Benson T., Sujecki S., Piramidowicz R.	Dysprosium-doped low phonon glasses for application in MIR light sources	138, P57
[Pub41]	Abstracts Book, 4th International Conference on RARE EARTH MATERIALS (REMAT) Advances in Synthesis, Studies and Applications, Reprotechnika Wrocław ISBN 978-83-940861-1-4	Anders K., Piątkowski D., Piramidowicz R.	ESA and ETU mechanisms in erbium doped multicomponent glasses	1–1
[Pub42]		Anders K., Jusza A., Ragiń T., Kochanowicz M., Żmojda J., Dorosz D., Piramidowicz R.	Luminescent properties of $Ho^{3+}+Er^{3+}$ doped bismuth oxide glasses	1–1
[Pub44]	Proceedings of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments ISBN 9781628418804 DOI:10.1117/12.2205546	Belka R., Keczkowska J., Suchańska M., Firek P., Wronka H., Radomska J., Czerwosz E.	Raman studies of C-Ni/Ti films deposited on Si (100)	SPIE 9662 1–7
[Pub45]	Proceedings of 39th International Microelectronics and Packaging Conference of IMAPS-CPMT Poland 2015 Politechnika Gdańska	Bisewski D., Myśliwiec M., Górecki K., Kisiel R., Zarębski J.	The investigation of thermal properties of the selected packages constructions for silicon carbide Schottky diodes	138, 1–6
[Pub46]	Proceedings of SPIE: Fifth Asia-Pacific Optical Sensors Conference ISBN 9781628418651 DOI:10.1117/12.2185154	Bogdanowicz R., Sobaszek M., Ficek M., Gnyba M., Ryl J., Siuzdak K., Śmietana M.	Nanocrystalline diamond microelectrode on fused silica optical fibers for electrochemical and optical sensing	SPIE, 9655 1–4
[Pub47]	The Sixth International Conference on Sensor Device Technologies and Applications, SENSORDEVICES 2015 ISBN 978-1-61208-426-8	Borecki M., Szmidt J., Michał K., Kociubiński A., Duk M., Frydrych J., Prus P.	Capillary Rise Multiparametric Sensor for Testing of Diesel and Biodiesel Fuel	37–43

[Pub48]	Proceedings of 22nd International Conference Mixed Design of Integrated Circuits and Systems MIXDES 2015 Lodz University of Technology, Department of Microelectronics and Computer Science ISBN 978-83-63578-06-0 DOI:10.1109/MIXDES.2015.7208538	Derlecki M., Borejko T., Pleskacz W.	IF polyphase filter design and calibration with back-gate biasing in 28 nm FD-SOI technology	334–338
[Pub49]	Abstracts Book, 4th International Conference on RARE EARTH MATERIALS (REMAT) Advances in Synthesis, Studies and Applications, Reprotechnika Wrocław ISBN 978-83-940861-1-4	Drozdowski W., Brylew K., Łachmański W., Wojtowicz A., Kisielewski J., Świrkowicz M., Turczyński S., Pawlak D., Malinowski M.	New praseodymium-activated oxide scintillators	1–1
[Pub50]	Book of Abstracts The Fifth International Workshop on Advanced Spectroscopy and Optical Materials, Uniwersytet Gdański	Fetliński B., Boruc Z., Jusza A., Piramidowicz R., Lipińska L., Malinowski M.	Down-shifting and down-conversion in $Y_4Al_2O_9:Ce^{3+}+Pr^{3+}+Yb^{3+}$ system	90 P09
[Pub51]	Proceedings of SPIE: 16th Scientific Conference Optical Fibers and Their Applications TAL 2015 ISBN 978-1510600577 DOI:10.1117/12.2228835	Filipowicz M., Napierała M., Murawski M., Ostrowski Ł., Szostkiewicz Ł., Szymański M., Tenderenda T., Anders K., Piramidowicz R., Wójcik G., Makara M., Poturaj K., Mergo P., Nasiłowski T.	Seven-core active fibre for application in telecommunication satellites	SPIE, 9816 131–137
[Pub52]	Proceedings of SPIE, Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments ISBN 9781628418804 DOI:10.1117/12.2203520	Geca M., Borecki M., Korwin-Pawlowski M., Kociubiński A.	Local liquid sample heating – integration and isolation of a micro-heater	SPIE, 9662 E1–E10
[Pub53]	Proceedings of the 2015 IEEE 18th International Symposium on Design and Diagnostics of Electronic Circuits and Systems ISBN 978-1-4799-6780-3 DOI:10.1109/DDECS.2015.26	Grodzicki A., Pleskacz W.	A Low Ripple Current Mode Voltage Doubler	63–68
[Pub54]	Proceedings of 39th International Microelectronics and Packaging Conference of IMAPS-CPMT Poland 2015 Politechnika Gdańska	Grzesiak W., Maćków P., Maj T., Synkiewicz B., Witek K., Kisiel R., Myśliwiec M., Borecki J., Serzysko T., Żupnik M.	Application of Direct Bonded Copper Substrates for Prototyping of Power Electronic Modules	139 1–11
[Pub55]	Proceedings of 22nd International Conference Mixed Design of Integrated Circuits and Systems MIXDES 2015 Lodz University of Technology, Department of Microelectronics and Computer Science ISBN 978-83-63578-06-0 DOI:10.1109/MIXDES.2015.7208542	Halauko A., Borejko T., Pleskacz W.	Low voltage LNA implementations in 28 nm FD-SOI technology for GNSS applications	354–358
[Pub56]	Book of Abstracts INFOS 2015 ISBN 978-88-9030-695-2	Jasiński J., Mazurak A., Mroczyński R., Majkusiak B.	Small-signal admittance model of multi-traps distributed over energy and space in the insulator of MIS tunnel structures	103–104
[Pub57]	Proceedings of 22nd International Conference Mixed Design of Integrated Circuits and Systems MIXDES 2015 Lodz University of Technology, Department of Microelectronics and Computer Science ISBN 978-83-63578-06-0 DOI:10.1109/MIXDES.2015.7208530	Jaworski Z.	Choosing the optimal HDL model of thermometer-to-binary encoder	297–300

[Pub58]	Proceedings of 22nd International Conference Mixed Design of Integrated Circuits and Systems MIXDES 2015 Lodz University of Technology, Department of Microelectronics and Computer Science ISBN 978-83-63578-06-0 DOI:10.1109/MIXDES.2015.7208544	Jaworski Z.	Optimization of capacitive divider for 8-bit DAC realized in 65 nm CMOS process	364–369
[Pub59]	Abstracts Book, 4th International Conference on RARE EARTH MATERIALS (REMAT) Advances in Synthesis, Studies and Applications, Reprotechnika Wrocław ISBN 978-83-940861-1-4	Jusza A., Golba A., Jastrzębska A., Polis P., Olszyna A., Jureczko J., Kunicki A., Piramidowicz R.	Luminescent properties of Pr^{3+}:Al_2O_3 nanopowders	1–1
[Pub60]	Book of Abstracts The Fifth International Workshop on Advanced Spectroscopy and Optical Materials, Uniwersytet Gdański	Jusza A., Lipińska L., Bercha A., Trzeciakowski W., Piramidowicz R.	UV and VIS emission properties of Tm^{3+}+Yb^{3+} doped $LaAlO_3$ and YF_3 nanocrystals	73, O26
[Pub61]		Kaczkan M., Turczyński S., Pawlak D., Malinowski M.	Laser site-selective spectroscopy of Eu^{3+} ions doped $Y_4Al_2O_9$	50, O3
[Pub62]		Kaczkan M.	Luminescence from the 5D0,1,2,3 excited states of Eu^{3+} in $Y_4Al_2O_9$ crystal	112, P31
[Pub63]	Proceedings of 22nd International Conference Mixed Design of Integrated Circuits and Systems MIXDES 2015 Lodz University of Technology, Department of Microelectronics and Computer Science ISBN 978-83-63578-06-0 DOI:10.1109/MIXDES.2015.7208513	Kasprowicz D.	Channel charge model of a dual-gate junctionless transistor	216–221
[Pub64]	Book of Abstracts: ISSE 2015, 38th International Spring Seminar on Electonics Technology ISBN 978-963-313-177-0	Kisiel R., Myśliwiec M.	Solder Joints for Flexible Connection Working at Low Temperatures	88–89
[Pub65]	Proceedings ISSE 2015, 38th International Spring Seminar on Electonics Technology ISBN 978-1-4799-8860-0 DOI:10.1109/ISSE.2015.7247981	Kisiel R., Myśliwiec M.	Solder Joints for Flexible Connection Working at Low Temperatures	157–160
[Pub66]	Proceedings of SPIE 24th International Conference on Optical Fiber Sensors ISBN 9781628418392 DOI:10.1117/12.2194467	Koba M., Śmietana M., Brzozowska E., Górska S., Mikulic P., Cusano A., Bock W.	Detection specificity studies of bacteriophage adhesin-coated long-period grating-based biosensor	SPIE, 963426 1–4
[Pub67]	Proceedings of SPIE: Fifth Asia-Pacific Optical Sensors Conference ISBN 9781628418651 DOI:10.1117/12.2185153	Koba M., Różycki-Bakon R., Firek P., Śmietana M.	Sensing properties of periodic stack of nano-films deposited with various vapor-based techniques on optical fiber end-face	SPIE, 9655 0R-1–0R-4
[Pub68]	Proceedings of SPIE, Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments ISBN 9781628418804 DOI:10.1117/12.2205854	Kowalska E., Czerwosz E., Kozłowski M., Firek P.	Influence of Substrate Type on Structure of C-Pd Thin Films	SPIE, 9662 1–6
[Pub69]	Book of Abstracts The Fifth International Workshop on Advanced Spectroscopy and Optical Materials, Uniwersytet Gdański	Laskownicki M., Jusza A., Anders K., Klimczak M., Malinowski M., Piramidowicz R.	Short-wavelength luminescent properties of holmium doped ZBLAN glasses,	134, P53

[Pub70]	2015 International Workshop on Integrated Nonlinear Microwave and Millimetre-wave Circuits (INMMiC) ISBN 978-1-4673-6496-6 DOI:10.1109/INMMIC.2015.7330378	Łukasik K., Barmuta P., Nielsen T., Madziar K., Schreurs D., Lewandowski A.	Hybrid load-pull system using a two-source nonlinear vector network analyzer	1–3
[Pub71]	Proceedings of the 9th German Microwave Conference ISBN 978-3-9812668-6-3 DOI:10.1109/GEMIC.2015.7107824	Madziar K., Osuch T., Galwas B.	Optoelectronic comb oscillators with FBG based frequency control	347–350
[Pub72]	Abstracts Book, 4th International Conference on RARE EARTH MATERIALS (REMAT) Advances in Synthesis, Studies and Applications, Reprotechnika Wrocław ISBN 978-83-940861-1-4	Malinowski M., Kaczkan M., Turczyński S., Pawlak D.	Luminescence properties of different RE^{3+} sites in $Y_4Al_2O_9$ crystals	1–1
[Pub73]	Proceedings of the 2015 IEEE 18th International Symposium on Design and Diagnostics of Electronic Circuits and Systems ISBN 978-1-4799-6780-3 DOI:10.1109/DDECS.2015.31	Marcinek K., Plasota M., Wielgus A., Pleskacz W.	Implementation of the ADELITE Microcontroller for Biomedical Applications	271–274
[Pub74]	Proceedings of the 2015 IEEE 18th International Symposium on Design and Diagnostics of Electronic Circuits and Systems ISBN 978-1-4799-6780-3 DOI:10.1109/DDECS.2015.48	Moskala M., Kloczko P., Ciepłucha M., Pleskacz W.	UVM-based Verification of Bluetooth Low Energy Controller	123–124
[Pub75]	Proceedings of SPIE, Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments ISBN 9781628418804 DOI:10.1117/12.2204814	Mroczkowski M., Firek P., Kalenik J., Kozłowski M., Szmidt J., Kowalska E., Czerwosz E.	Influence of temperature and humidity on titanium electrodes intended for an above normative conditions sensors	SPIE, 966243 1–8
[Pub76]	Fall Meeting 2015	Mroczyński R., Szymańska M.	Thermal stability of hafnium oxide (HfO_x) and hafnium oxynitride (HfO_xN_y) layers deposited by means of r.f. reactive magnetron sputtering process	EMRS 258–258
[Pub77]	Proceedings of 39th International Microelectronics and Packaging Conference of IMAPS-CPMT Poland 2015, Politechnika Gdańska	Myśliwiec M., Lewandowski A., Wiatr W., Weremczuk J., Szczepański Z., Kisiel R.	Challenges in packaging of IR detectors – technology of elastic electrical connections	1–4
[Pub78]	Proceedings of SPIE, Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments SPIE, ISBN 9781628418804 DOI:10.1117/12.2203125	Prus P., Borecki M., Korwin-Pawlowski M., Duk M.	Software detection of characteristics data of optical signals received in multiparametric capillary sensors of diesel fuel	SPIE, 9662 091–98
[Pub79]	Mat. XIV Krajowej Konferencji Elektroniki: KKE 2015	Rosiński Ł., Mroczyński R., Gierałtowska S., Wachnicki Ł.	Technologia i charakteryzacja amorficznych warstw tlenku cynku domieszkowanego indem i galem (a-IGZO)	1–8
[Pub80]	Proceedings of 22nd International Conference Mixed Design of Integrated Circuits and Systems MIXDES 2015, Lodz University of Technology, Department of Microelectronics and Computer Science ISBN 978-83-63578-06-0 DOI:10.1109/MIXDES.2015.7208477	Siwiec K., Marcinek K., Borejko T., Jarosz A., Kopański J., Kurjata-Pfitzner E., Narczyk P., Plasota M., Wielgus A., Pleskacz W.	A CMOS System-on-Chip for Physiological Parameters Acquisition, Processing and Monitoring	37–42

[Pub81]	Abstracts of 1st URSI Atlantic Radio Science Conference (URSI AT-RASC) ISBN 9789090086286 DOI:10.1109/URSI-AT-RASC.2015.7303017	Siwiec K., Pleskacz W.	A Low Phase Noise Low Power Fractional-N Synthesizer Architecture	1–1
[Pub82]	Proceedings of 22nd International Conference Mixed Design of Integrated Circuits and Systems MIXDES 2015, Lodz University of Technology, Department of Microelectronics and Computer Science ISBN 978-83-63578-06-0 DOI:10.1109/MIXDES.2015.7208565	Staniewski M., Pfitzner A.	Compact DC model of a JVeSFET transistor with reduced number of empirical parameters	470–475
[Pub83]	Proceedings on the Conference on Lasers and Electro-Optics Europe and 12th European Quantum Electronics Conference ISBN 978-1-4673-7475-0	Stopiński S., Lelit M., Jusza A., Anders K., Osuch T., Szczepański P., Różanowski K., Lewandowski J., Piramidowicz R.	Photonic integrated interrogator for fiber-optic sensor networks	1
[Pub84]	Proceedings of SPIE 24th International Conference on Optical Fiber Sensors ISBN 9781628418392 DOI:10.1117/12.2195214	Śmietana M., Koba M., Mikulic P., Bock W.	Enhancing sensitivity of long-period gratings by combined fiber etching and diamond-like carbon nano-overlay deposition	SPIE, 9634 56-1– –56-4
[Pub85]	Official Proceedings of Microtherm 2015, Lodz University of Technology ISBN 978-83-932197-3-5	Tanous D., Mazurak A., Majkusiak B.	Charging/discharging processes in nanocrystaline MOS structures–Theoretical study	277–282
[Pub86]	Central European Higher Education Cooperation Conference Proceedings, Corvinus University of Budapest Digital Press, ISBN 978-963-503-602-8	Woźnicki J., Degtyarova I., Pacuska M.	Regulatory Requirements Towards Higher Education System Reform: The Polish Case	60–70

7.4. Scientific and Technical Books

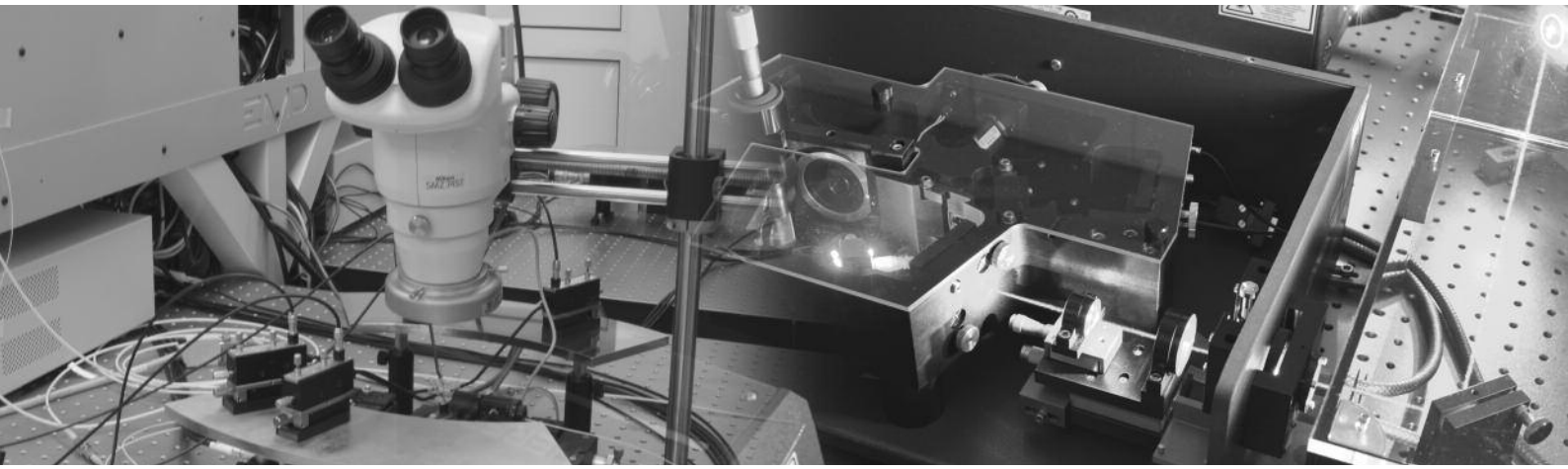
NUMBER	AUTHORS	PUBLISHER, ISBN	TITLE	PAGES
[Pub87]	Bock W., Tripathi S., Śmietana M.	Springer International Publishing, ISBN 978-3-319-06997-5	Sensitive and Selective Lab-on-a-Fiber Sensor for Bacteria Detection in Water, in: Lab-on-Fiber Technology / Cusano Andrea [et al.] (eds.)	301–313
[Pub88]	Felba J., Kisiel R.	Oficyna Wydawnicza Politechniki Wrocławskiej, ISBN 978-83-7493-889-1	Podstawy konstrukcji aparatury elektronicznej	178
[Pub89]	Stamenkovic Z., Pleskacz W., Raik J., T. Vierhaus H. (eds.)	IEEE Computer Society, ISBN 978-1-4799-6780-3	Proceedings of the 2015 IEEE 18th International Symposium on Design and Diagnostics of Electronic Circuits and Systems	310
[Pub90]	Woźnicki J.	Wydawnictwo Naukowe UAM, ISBN 978-83-232-2847-9	Analiza współpracy uczelni polskich i ukraińskich na tle porównania systemów szkolnictwa wyższego. Wnioski i rekomendacje / Woźnicki J. (eds.)	258
[Pub91]	Woźnicki J.	Wydawnictwo Naukowe UAM, ISBN 978-83-232-2847-9	Doświadczenia z wprowadzania reform w szkolnictwie wyższym polski i Ukrainy – systemy szkolnictwa wyższego na ich ścieżce rozwojowej w obu krajach, in: Analiza współpracy uczelni polskich i ukraińskich na tle porównania systemów szkolnictwa wyższego. Wnioski i rekomendacje / Woźnicki Jerzy (eds.),	11–39

[Pub92]	Woźnicki J.	Wydawnictwo SGGW, ISBN 978-83-7583-621-9	Program rozwoju szkolnictwa wyższego do 2020 r. – Deregulacja w systemie szkolnictwa wyższego / Woźnicki Jerzy (eds.)	216
[Pub93]	Woźnicki J.	Wydawnictwo SGGW, ISBN 978-83-7583-617-2	Program rozwoju szkolnictwa wyższego do 2020 r. – Opis prac nad programem rozwoju szkolnictwa wyższego do 2020 r. i jego najważniejsze elementy / Woźnicki J. (eds.)	52
[Pub94]	Woźnicki J.	Wydawnictwo SGGW, ISBN 978-83-7583-621-9	Rola regulacji i wymogi deregulacji w systemie szkolnictwa wyższego, in: Program rozwoju szkolnictwa wyższego do 2020 r. – Deregulacja w systemie szkolnictwa wyższego / Woźnicki Jerzy (eds.)	15–31

8. PATENTS

[Pat1] Kuźmicz Wiesław, **Supply voltage circuit for complementary bipolar digital gates** (Układ zasilania cyfrowych bramek, zwłaszcza złożonych z komplementarnych par tranzystorów bipolarnych), zgłoszenie patentowe no. P-413719, 28-08-2015

[Pat2] Borejko Tomasz, Grądzki Jacek, Koter Aleksander Paweł, Siwiec Krzysztof, Pleskacz Witold, **Blocks of the GPS/Galileo signal receiver for L1/E1 band** (Bloki toru odbiorczego sygnału GPS/Galileo na pasmo L1/E1, Topografia układów scalonych), no S-0014, 20-10-2015



Optoelectronics Division

9. REPORTS

NUMBER	AUTHORS	TITLE	TYPE
[Rep1]	Anders K., Andrejuk P., Siejak E., Bercha A., Trzeciakowski W., Piątkowski D., Piramidowicz R.	Upconversion phenomena in oxide and fluoride glasses doped with erbium	**presentation:** The Fifth International Workshop on Advanced Spectroscopy and Optical Materials 2015
[Rep2]	Anders K.	High power erbium fiber laser in all-fiber geometry	**scientific report** from the project granted by the Warsaw University of Technology
[Rep3]	Anders K., Jusza A., Kalisiak M., Markowski K., Osuch T., Piramidowicz R.	Towards green fiber laser in all-fiber geometry	**paper presented:** Konferencja światłowody i ich Zastosowania, KEiT PAN
[Rep4]	Anders K., Jusza A., Ragiń T., Kochanowicz M., Żmojda J., Dorosz D., Piramidowicz R.	Luminescent properties of $Ho^{3+}+Er^{3+}$ doped bismuth oxide glasses	**poster:** 4th International Conference on RARE EARTH MATERIALS (REMAT) Advances in Synthesis, Studies and Applications 2015
[Rep5]	Anders K., Krysiński R., Benson T., Seddon A.B., Sujecki S., Piramidowicz R.	New materials for MIR lasers and amplifiers	**poster:** III Symposium of the Photonics Society of Poland combined with 3rd International Trade for Optoelectronics and Photonics OPTONexpo 2015
[Rep6]	Anders K., Krysiński R., Seddon A.B., Benson T., Sujecki S., Piramidowicz R.	Dysprosium-doped low phonon glasses for application in MIR light sources	**poster**: The Fifth International Workshop on Advanced Spectroscopy and Optical Materials 2015
[Rep7]	Anders K., Krysiński R., Seddon A.B., Benson T., Sujecki S., Piramidowicz R.	Luminescent properties in mid infra-red of dysprosium doped chalcogenide fibers	**poster**: Konferencja światłowody i ich Zastosowania, KEiT PAN 2015
[Rep8]	Anders K.	Novel luminescent materials for mid-infrared region – analysis and investigation of optical properties of chalcogenide glasses doped with rare earth ions	**scientific report** from the project granted by the National Science Centre
[Rep9]	Anders K., Piątkowski D., Piramidowicz R.	ESA and ETU mechanisms in erbium doped multicomponent glasses	**poster**: 4th International Conference on RARE EARTH MATERIALS (REMAT) Advances in Synthesis, Studies and Applications 2015
[Rep10]	Beck R.	Technology and characterization of ultrathin silicon layers formed by means of PECVD for nanelectronic applications	**scientific report** from the project granted by the National Science Centre
[Rep11]	Bisewski D., Myśliwiec M., Górecki K., Kisiel R., Zarębski J.	The investigation of thermal properties of the selected packages constructions for silicon carbide Schottky diodes	**poster**: 39th International Microelectronics and Packaging Conference 2015
[Rep12]	Borecki M., Kotela A., Stobiński L., Korwin-Pawlowski M., Filczak K., Kotela I., Szmidt J.	Antibacterial properties of graphene oxide film deposited on selected orthopaedic implants	**paper presented:** XXXVI th IEEE-SPIE Joint Symposium on Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments 2015
[Rep13]	Borecki M.	Logistics and monitoring technologies and ways to protect the environment before starting work, during drilling, hydraulic fracturing processes and during the operation, including monitoring of groundwater, air, noise, soil, greenhouse gases and other	**scientific report** from the project granted by the National Centre for Research and Development
[Rep14]	Borecki M., Szmidt J., Korwin--Pawłowski M., Duk M., Kociubiński A., Frydrych J.	Capillary Rise Multiparametric Sensor for Testing of Diesel and Biodiesel Fuel	**paper presented:** The Sixth International Conference on Sensor Device Technologies and Applications, IARIA Conference 2015

[Rep15]	Borecki M., Szmidt J., Stobiński L., Korwin-Pawlowski M., Duk M., Kociubiński A., Prus P., Doroz P.	Sensing of Graphene Oxide-Amino Acid Complex Behavior Under Fast Thermal Shocks in Water Environment	**paper presented:** 10th Conference Integrated Optics – Sensors, Sensing Structures and Methods 2015
[Rep16]	Bortnowski P., Anders K., Teodorczyk M., Dąbrowska E., Maląg A., Piramidowicz R.	Fiber-optic combiner for application in high power LD systems	**poster:** Konferencja światłowody i ich Zastosowania, KEiT PAN 2015
[Rep17]	Brzozowska E., Koba M., Śmietana M., Górska S., Gamian A., Bock W.	Eschericha coli bacteria detection using bacteriophage-adhesin-coated long-period gratings	**poster:** 4th International Conference on Bio-Sensing Technology 2015
[Rep18]	Cedro T., Baszun M., Grzanka A.	Własne sterowniki dla Matlab	**paper presented:** międzynarodowa Telemedycyna i eZdrowie 2015
[Rep19]	Dębowska A.	Neuronal cell cultures substrates with optical fiber sensors monitoring	**scientific report** from the project granted by the Ministry of Science and Higher education
[Rep20]	Drozdowski W., Brylew K., Łachmański W., Wojtowicz A., Kisielewski J., Świrkowicz M., Turczyński S., Pawlak D., Malinowski M.	New praseodymium-activated oxide scintillators	**presentation:** 4th International Conference on RARE EARTH MATERIALS (REMAT) Advances in Synthesis, Studies and Applications 2015
[Rep21]	Filipowicz M., Napierała M., Murawski M., Ostrowski Ł., Szostkiewicz Ł., Anders K., Piramidowicz R., Makara M., Poturaj K., Mergo M., Nasiowski T.	Er-doped seven-core rad-hard fibers for space applications	**poster:** 10th Conference Integrated Optics – Sensors, Sensing Structures and Methods 2015
[Rep22]	Filipowicz M., Napierała M., Murawski M., Ostrowski Ł., Szostkiewicz Ł., Anders K., Piramidowicz R., Makara M., Poturaj K., Mergo M., Nasiłowski T.	Er-doped seven-core rad-hard fibres for space applications	**presentation:** 1st International Conference on Innovative Research and Maritime Applications of Space Technology 2015
[Rep23]	Filipowicz M., Napierała M., Murawski M., Ostrowski Ł., Szostkiewicz Ł., Szymański M., Tenderenda T., Anders K., Piramidowicz R., Wójcik G., Makara M., Poturaj K., Mergo P., Nasiłowski T.	Siedmiordzeniowy światłowód aktywny do zastosowań w satelitach telekomunikacyjnych	**presentation:** Konferencja światłowody i ich Zastosowania, KEiT PAN 2015
[Rep24]	Galwas B., Piwowarska E., Paluch D., Radwański T., Sobieraj R., Madziar K.	Pakiet e-kursów dla kadry akademickiej Politechniki Warszawskiej przygotowujących do prowadzenia zajęć z wykorzystaniem kształcenia na odległość	**presentation:** XV Konferencja Uniwersytet Wirtualny Model, Narzędzia, Praktyka 2015
[Rep25]	Galwas B.	Radio over Fiber Systems	**paper presented:** 25th International Travelling Summer School on Microwaves and Lightwaves 2015
[Rep26]	Geca M., Borecki M., Korwin-Pawlowski M., Kociubiński A.	Local liquid sample heating – integration and isolation of a micro-heater	**paper presented:** XXXVI-th IEEE-SPIE Joint Symposium on Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments 2015
[Rep27]	Geca M., Kociubiński A., Janczyk G., Bieniek T., Duk M., Borecki M.	4H-SiC microheater for local heating of liquid samples in multiparametric capillary sensors	**poster:** Conference Smart Engineering of New Materials 2015
[Rep28]	Goryachev M., Zhao L., Zhao Z., Farr W., Krupka J., Tobar M.	Determination of the Anisotropy of Permittivity of Quantum Paraelectric Strontium Titanate	**paper** arXiv:1508.07550

[Rep29]	Grzesiak W., Maćków P., Maj T., Synkiewicz B., Witek K., Kisiel R., Myśliwiec M., Borecki J., Serzysko T., Żupnik M.	Application of Direct Bonded Copper Substrates for Prototyping of High Power Electronic Modules	**poster:** 39th International Microelectronics and Packaging Conference 2015
[Rep30]	Jasiński J.	Electrical characterization of the advanced MIS structures in the range of low and very low frequencies	**scientific report** from the project granted by the National Science Centre
[Rep31]	Jasiński J.	Construction of Universal Prototyping Platform	**scientific report** from the project granted by the Warsaw University of Technology
[Rep32]	Jasiński J., Mazurak A., Mroczyński R., Majkusiak B.	Small-signal admittance model of multi-traps distributed over energy and space in the insulator of MIS tunnel structures	**poster:** Instytut Mikroelektroniki i Optoelektroniki Politechniki Warszawskiej, 19th Conference of Insulting Films on Semiconductors
[Rep33]	Jusza A.	Composite polymer fibers doped with metalo-organic Dy^{3+} complexes – new generation of optically active media	**scientific report** from the project granted by the Warsaw University of Technology
[Rep34]	Jusza A., Golba A., Gil M., Łyszczek R., Mergo P., Polis P., Lipińska L., Piramidowicz R.	Novel Luminescent Materials Based on Polymer Composites	**poster:** III Symposium of the Photonics Society of Poland combined with 3rd International Trade for Optoelectronics and Photonics OPTONexpo 2015
[Rep35]	Jusza A., Golba A., Jastrzębska A., Polis P., Olszyna A., Jureczko J., Kunicki A., Piramidowicz R.	Luminescent properties of Pr^{3+}:Al_2O_3 nanopowders	**presentation:** 4th International Conference on RARE EARTH MATERIALS (REMAT) Advances in Synthesis, Studies and Applications 2015
[Rep36]	Jusza A., Lipińska L., Polis P., Olszyna A., Piramidowicz R.	Up-conversion emission properties of thulium doped PMMA nanocomposites	**poster:** Konferencja światłowody i ich Zastosowania, KEiT PAN 2015
[Rep37]	Jusza A.	Study on possibilities of shaping the luminescent properties of composite white light sources based on polymer materials	**scientific report** from the project granted by the National Science Centre
[Rep38]	Jusza A., Żyniewicz A., Lipińska L., Polis P., Olszyna A., Łyszczek R., Gil M., Mergo P., Piramidowicz R.	Dysprosium-doped nanomaterials – new dopants for polymer-based composite fibers	**poster:** Konferencja światłowody i ich Zastosowania, KEiT PAN 2015
[Rep39]	Kisiel R.	Integretaion of thermoeletrically cooled infrared photodetectors with wideband electonics	**scientific report** from the project granted by the National Centre for Research and Development
[Rep40]	Koba M., Różycki-Bakon R., Firek P., Śmietana M.	Sensing properties of periodic stack of nano-films deposited with various vapor-based techniques on optical fiber end-face	**poster:** The 5th Asia-Pacific Optical Sensors Conference 2015
[Rep41]	Kociubiński A., Duk M., Bieniek T., Janczyk G., Kwietniewski N., Borecki M.	Experience on 4H-SiC based photodetectors development	**poster:** Conference Smart Engineering of New Materials 2015
[Rep42]	Kociubiński A., Duk M., Borecki M.	Silicon carbide on silicon photodiode stacks ultraviolet/visible dual-band detector	**poster:** 10th Conference Integrated Optics – Sensors, Sensing Structures and Methods 2015
[Rep43]	Kociubiński A., Duk M., Sochacki M., Bieniek T., Janczyk G., Borecki M.	Silicon carbide on silicon photodiode stacks ultraviolet/visible dual-band detector	**poster:** Conference Smart Engineering of New Materials 2015

[Rep44]	Król K.	The effect of phosphorus on the electro-physical properties of dielectric layers produced by 4H-SiC thermal oxidation	**scientific report** from the project granted by the National Science Centre
[Rep45]	Kuźmicz W.	THIN but Great Silicon 2 Design Objects	**scientific report** from the project granted by the EU project
[Rep46]	Kuźmicz W.	VESTIC: a new manufacturing technology for integrated circuits	**scientific report** from the project granted by the National Centre for Research and Development
[Rep47]	Laskownicki M., Jusza A., Anders K., Klimczak M., Malinowski M., Piramidowicz R.	Short-wavelength luminescent properties of holmium doped ZBLAN glasses	**poster:** The Fifth International Workshop on Advanced Spectroscopy and Optical Materials 2015
[Rep48]	Lelit M., Stopiński S., Piramidowicz R.	Multiwavelength transceiver in photonic integration technology	**poster:** XXXVIth IEEE-SPIE Joint Symposium on Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments 2015
[Rep49]	Madziar K., Galwas B., Osuch T.	Optoelectronic Comb Oscillators with FBG based Frequency Control	**poster:** German Microwave Conference 2015
[Rep50]	Madziar K.	Generation of high frequency signals involving photonic techniques	**paper presented:** 25th International Travelling Summer School on Microwaves and Lightwaves 2015
[Rep51]	Madziar K.	Nonlinear Properties and S-matrix Description of a Mach-Zehnder Modulator	**poster:** XXXVIth IEEE-SPIE Joint Symposium on Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments 2015
[Rep52]	Malinowski M., Kaczkan M., Turczyński S., Pawlak D.	Luminescence properties of different RE^{3+} sites in $Y_4Al_2O_9$ crystals	**presentation:** 4th International Conference on RARE EARTH MATERIALS (REMAT) Advances in Synthesis, Studies and Applications 2015
[Rep53]	Malinowski M.	Modeling and investigation of optical materials, photonic structures and circuits	**scientific report** from the project granted by the Warsaw University of Technology
[Rep54]	Marcinek K.	The generic GNSS processor architecture for satellite navigation systems	**scientific report** from the project granted by the Warsaw University of Technology
[Rep55]	Mossakowska-Wyszyńska A., Witoński P.	Bistable Operation of 1D PC Waveguide Laser with Saturable Absorber	**poster:** III Symposium of the Photonics Society of Poland combined with 3rd International Trade for Optoelectronics and Photonics OPTONexpo 2015
[Rep56]	Mroczkowski M.	Microstructure Analysis of Electroluminescent Zinc Sulphide Phosphors for Application in Printed Electronic Devices	**scientific report** from the project granted by the National Science Centre
[Rep57]	Mroczyński R.	Institute of Microelectronics and Optoelectronics – field of expertise	**presentation:** KEUDOS Plus Workshop 2015
[Rep58]	Mroczyński R.	Institute of Microelectronics and Optoelectronics – field of potential interest	**presentation:** KNU Research Meeting 2015
[Rep59]	Mroczyński R., Kwietniewski N., Judek J., Szczepański P.	Selected issues of the fabrication of infrared photodetectors based on graphene	**presentation:** KEUDOS Plus Workshop 2015
[Rep60]	Mroczyński R., Mazurak A., Jasiński J.	Na styku trzech obszarów – o działalności naukowo-badawczej w Zakładzie Przyrządów Mikroelektroniki i Nanoelektroniki IMiO PW	**presentation:** Spotkanie Interdyscyplinarne w ramach projektu CEZAMAT 2015

[Rep61]	Mroczyński R.	Modification of properties of MOS test structures with high permittivity gate dielectric layers	**scientific report** from the project granted by the Warsaw University of Technology
[Rep62]	Myśliwiec M., Lewandowski A., Wiatr W., Weremczuk J., Szczepański Z., Kisiel R.	Challenges in packaging of IR detectors – technology of elastic electrical connections	**poster:** 39th International Microelectronics and Packaging Conference 2015
[Rep63]	Napierała M., Murawski M., Szostkiewicz Ł., Ziołowicz A., Pytel A., Tenderenda T., Ostrowski Ł., Szymański M., Jóźwik M., Hołdyński Z., Filipowicz M., Anders K., Piramidowicz R., Karpierz M., Makara M., Poturaj K., Mergo M., Nasiłowski T.	Multicore fibers and their applications	**presentation:** 10th Conference Integrated Optics – Sensors, Sensing Structures and Methods 2015
[Rep64]	Obrębski W., Szczepankowski M., Tor P., Krupka J., Piątkowska-Janko E., Sawionek B., Bogorodzki P.	Hiperpolaryzacja wody – eksperymentalny układ do tomografu MRI 0.23T	**presentation:** XIX Krajowa Konferencja Naukowa: Biocyberetyka i Inżynieria Biomedyczna 2015
[Rep65]	Ostrowski Ł., Napierała M., Murawski M., Szostkiewicz Ł., Szymański M., Mergo P., Piramidowicz R., Nasiłowski T.	Światłowody o ekstremalnie dużym polu modu zdolne do filtracji modów wyższych rzędów	**presentation:** Konferencja światłowody i ich Zastosowania, KEiT PAN 2015
[Rep66]	Parka J.	Investigations of nonlinear phenomena in Mach-Zender modulator in microwave photonic systems and optimization of 3D images in THz range realized in reflected (transmitted) system	**scientific report** from the project granted by the Warsaw University of Technology
[Rep67]	Pfitzner A., Kuźmicz W., Jaworski Z., Pleskacz W.	Systemy scalone – od zastosowań tradycyjnej technologii CMOS do najnowszych koncepcji FD-SOI oraz VESTIC	**paper presented:** Krajowa Konferencja Radiokomunikacji, Radiofonii i Telewizji 2015
[Rep68]	Pfitzner A.	The methods of design automation for calibration of analog and RF integrated circuits implemented in submicron CMOS technologies	**scientific report** from the project granted by the Warsaw University of Technology
[Rep69]	Piramidowicz R.	The conditions of short-wavelength emission excitation in optically active low-phonon glasses and composite materials pumped with pressure-tuned laser diodes	**scientific report** from the project granted by the National Science Centre
[Rep70]	Piwowarska E.	Supporting Educational Initiatives of the Warsaw University of Technology in Teaching and Skill Improvement Training in the Area of Teleinformatics	**scientific report** from the project granted by the National Centre for Research and Development
[Rep71]	Pleskacz W.	Dual-mode blocks of the integrated circuit GALILEO and GPS signal receiver in nanometer CMOS technology for precise positioning of mobile objects	**scientific report** from the project granted by the National Centre for Research and Development
[Rep72]	Pleskacz W.	Integrated circuit technology for measurement of psychophysiological parameters under dynamic conditions	**scientific report** from the project granted by the National Centre for Research and Development
[Rep73]	Pleskacz W.	Soldier psychological profile management system including development and use of HEALTH-CHIPS technology	**scientific report** from the project granted by the National Centre for Research and Development
[Rep74]	Prus P., Borecki M., Korwin-Pawlowski M., Duk M.	Software detection of characteristics data of optical signals received in multi-parametric capillary sensors	**paper presented:** XXXVI th IEEE-SPIE Joint Symposium on Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments 2015
[Rep75]	Śmietana M., Koba M., Mikulic P., Bogdanowicz R., Bock W.	Improved diamond-like carbon coating deposition uniformity by sample suspension in RF PECVD chamber	**poster:** 20th International Hasselt Diamond Workshop on CVD diamond and other carbon materials 2015

[Rep76]	Sochacki M.	Methods and means of protection and defense against high power microwave pulses	**scientific report** from the project granted by the National Centre for Research and Development
[Rep77]	Stopiński S., Jusza A., Anders K., Lelit M., Szczepański P., Piramidowicz R.	Photonic integrated circuits	**poster:** III Symposium of the Photonics Society of Poland combined with 3rd International Trade for Optoelectronics and Photonics OPTONexpo 2015
[Rep78]	Stopiński S., Lelit M., Jusza A., Anders K., Osuch T., Szczepański P., Różanowski K., Lewandowski J., Piramidowicz R.	Photonic integrated interrogator for fiber-optic sensor networks	**presentation:** Conference on Lasers and Electro-Optics Europe and European Quantum Electronics Conference 2015
[Rep79]	Stopiński S.	Optical gyroscope in an experimental photonic integration technology – analysis of possibility of realization and research on basic properties	**scientific report** from the project granted by the National Science Centre
[Rep80]	Stopiński S.	Tunable lasers in photonic integration technology	**scientific report** from the project granted by the Warsaw University of Technology
[Rep81]	Szczepański P., Janaszek B.	Analiza właściwości optycznych materiałów hiperbolicznych opartych na grafenie	**poster:** XIII Seminarium Powierzchnia i Struktury Cienkowarstwowe 2015
[Rep82]	Szczepański P., Janaszek B., Piekarski R.	Generacja impulsów ultrakrótkich w laserach planarnych z użyciem grafenu jako nieliniowego absorbera	**poster:** XIII Seminarium Powierzchnia i Struktury Cienkowarstwowe 2015
[Rep83]	Szczepański P.	Ultrafast Photodetector based on Graphene (PhotoGraph),	**scientific report** from the project granted by the National Centre for Research and Development
[Rep84]	Szmidt J.	Design, materials and technologies for microsystems in sensor technology	**scientific report** from the project granted by the Warsaw University of Technology
[Rep85]	Szmidt J.	Development of an accurate model of traps in metal/insulator/4H-SiC structures by Thermally Stimulated Current (TSC) measurement	**scientific report** from the project granted by the National Science Centre
[Rep86]	Szmidt J.	Innovative graphen-titanium engine valve with improved functional properties	**scientific report** from the project granted by the National Centre for Research and Development
[Rep87]	Szmidt J.	Light sources with cold emitters	
[Rep88]	Szmidt J.	Oxide nanostructures for electronics, optoelectronics and photovoltaics	**scientific report** from the project granted by the National Science Centre
[Rep89]	Tanous D., Mazurak A., Majkusiak B.	Charging/discharging processes in nanocrystaline MOS structures – Theoretical study	**poster:** Microtechnology and thermal problems in electronics 2015
[Rep90]	Witoński P., Mossakowska-Wyszyńska A.,	Designing of 1D Waveguide Laser with Three-Layer PC	**poster:** III Symposium of the Photonics Society of Poland combined with 3rd International Trade for Optoelectronics and Photonics OPTONexpo 2015
[Rep91]	Woźnicki J.,	Szkolnictwo wyższe: zarządzanie, governance i polityka publiczna	**presentation:** Konferencja Liderzy Zarządzania Uczelniami 2015
[Rep92]	Woźnicki J.	The selected deregulation requirements towards HES reforms in Poland based on the report „Deregulation in HE system"	**presentation:** 1st Central European Higher Education Cooperation (CEHEC) Conference 2015
[Rep93]	Woźnicki J.,	Wyzwania stojące przed szkolnictwem wyższym /z perspektywy polityki publicznej/.Wyzwania strategiczne	**presentation:** Kongres Rozwoju Edukacji 2015

10. CONFERENCES, SEMINARS AND MEETINGS

10.1. Conferences

NUMBER	CONFERENCE	PARTICIPANTS
[Con1]	1st Central European Higher Education Cooperation (CEHEC) Conference (CEHEC 2015), January 28–29, Budapest, Hungary	Woźnicki J.
[Con2]	1st International Conference on Innovative Research and Maritime Applications of Space Technology (IRMAST 2015), April 23–24, Gdańsk, Poland	Anders K., Ostrowski Ł., Piramidowicz R.
[Con3]	1st URSI Atlantic Radio Science Conference (URSI AT-RASC), May16–24, Gran Canaria, Spain	Pleskacz W., Siwiec K.
[Con4]	4th International Conference on Bio-Sensing Technology (Bio-Sensing Technology 2015), May 10–13, Lisbon, Portugal	Śmietana M.
[Con5]	4th International Conference on RARE EARTH MATERIALS (REMAT) Advances in Synthesis, Studies and Applications (REMAT 2015), September 26–28, Ślęza/Wrocław, Poland	Anders K., Golba A., Jusza A., Kaczkan M., Malinowski M., Piramidowicz R.
[Con6]	10th Conference Integrated Optics – Sensors, Sensing Structures and Methods (IOS 2015), March 02–06, Szczyrk, Poland	Anders K., Borecki M., Ostrowski Ł., Piramidowicz R., Szmidt J.
[Con7]	16th Conference on Optical Fibers and Their Applications, September 22–25, Nałęczów, Poland	Anders K., Ostrowski Ł., Piramidowicz R., Tenderenda T.
[Con8]	19th Conference of Insulting Films on Semiconductors (INFOS 2015), June 30–July 02, Università degli Studi di Udine, Italy	Jasiński J., Majkusiak B., Mazurak A., Mroczyński R.
[Con9]	22nd International Conference Mixed Design of Integrated Circuits and Systems (MIXDES 2015), June 25–27, Toruń, Poland	Borejko T., Halauko A., Jaworski Z., Kasprowicz D., Kopański J., Marcinek K., Narczyk P., Pfitzner A., Pleskacz W., Siwiec K., Wielgus A.
[Con10]	24th International Conference on Optical Fibre Sensors (OFS24), September 28–October 02, Curitiba, Brazil	Śmietana M.
[Con11]	39th International Microelectronics and Packaging Conference (IMAPS-CPMT Poland 2015), September 20–23, Gdańsk, Poland	Borecki M., Myśliwiec M., Kisiel R., Myśliwiec M., Szczepański Z.
[Con12]	Conference on Lasers and Electro-Optics Europe and European Quantum Electronics Conference 2015 (CLEO/Europe-EQEC 2015), June 21–25, Munich, Germany	Anders K., Jusza A., Piramidowicz R., Stopiński S.
[Con13]	Conference Smart Engineering of New Materials (SENM 2015), June 22–25, Łódź, Poland	Bieniek T., Borecki M., Janczyk G., Sochacki M.
[Con14]	German Microwave Conference (GeMiC 2015), March 16–18, Nurnberg, Germany	Galwas B., Madziar K.
[Con15]	IEEE 18th International Symposium on Design and Diagnostics of Electonic Circuits and Systems (DDECS 2015), April 22–24, Belgrade, Serbia	Grodzicki A., Marcinek K., Pleskacz W., Wielgus A.
[Con16]	III Ogólnopolski Kongres Politologii „Odsłony polityki" (III Kongres Politologii), Septeber 22–24, Kraków, Poland	Woźnicki J.
[Con17]	III Symposium of the Photonics Society of Poland combined with 3rd International Trade for Optoelectronics and Photonics OPTONexpo (Opton 2015), April 08–09, Warszawa, Poland	Anders K., Jusza A., Mossakowska-Wyszyńska A., Piramidowicz R., Stopiński S., Witoński P.
[Con18]	Konferencja Liderzy Zarządzania Uczelniami (LUMEN 2015), November 23–24, Courtyard by Marriott, Warszawa, Poland	Woźnicki J.

[Con19]	Konferencja międzynarodowa Telemedycyna i eZdrowie, September 29–30, Warszawa, Poland	Baszun M.
[Con20]	Konferencja światłowody i ich Zastosowania, KEiT PAN (TAL 2015), September 22–25, Nałeczów, Poland	Anders K., Jusza A., Ostrowski Ł., Piramidowicz R., Tenderenda T.
[Con21]	Kongres Rozwoju Edukacji (KRE 2015), November 18–19, Warsaw, Poland	Woźnicki J.
[Con22]	Krajowa Konferencja Radiokomunikacji, Radiofonii i Telewizji (KKRRiT 2015), April 08–10, Politechnika Łódzka, Łódź, Poland	Pfitzner A., Kuźmicz W., Jaworski Z., Pleskacz W.
[Con23]	Microtechnology and thermal problems in electronics (MICROTHERM 2015), June 23–25, Łódź, Poland	Majkusiak B., Mazurak A., Tanous D.
[Con24]	The 29th European Conference on Solid-State Transducers (EUROSENSORS 2015) September 06–09, Freiburg, Germany	Kisiel R.
[Con25]	The 5th Asia-Pacific Optical Sensors Conference (APOS 2015), May 20–22, Jeju, Jeju Island, South Korea	Śmietana M.
[Con26]	The Sixth International Conference on Sensor Device Technologies and Applications, IARIA Conference, (SENSORDEVICES 2015), August 23–28, Venice, Italy	Borecki M., Szmidt J.
[Con27]	XIV Krajowa Konferencja Elektroniki (KKE 2015), July 08–12, Darłówko Wschodnie, Poland	Mroczyński R.
[Con28]	XIX Krajowa Konferencja Naukowa: Biocyberetyka i Inżynieria Biomedyczna, October 14–16, Warszawa, Poland	Krupka J.
[Con29]	XV Konferencja Uniwersytet Wirtualny Model, Narzędzia, Praktyka (VU 2015), July 24–25, Uniwersytet Warszawski, Warszawa, Poland	Galwas B., Madziar K.,Piwowarska E.
[Con30]	XXXVI th IEEE-SPIE Joint Symposium on Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments (IEEE-SPIE WILGA 2015), May 25–31, Wilga, Poland	Borecki M., Firek P., Kalenik J., Madziar K., Mroczkowski M., Piramidowicz R., Stopiński S., Szmidt J.

10.2. Schools, Seminars and Meetings

NUMBER	CONFERENCE	PARTICIPANTS
[Con31]	16th Topical Meeting on the Optics of Liquid Crystals (OLC'2015), September 13–18, Sopot, Poland	Parka J.
[Con32]	20th International Hasselt Diamond Workshop on CVD diamond and other carbon materials (SBDD 2015), February 25–27, Hasselt, Belgium	Śmietana M.
[Con33]	25th International Travelling Summer School on Microwaves and Lightwaves (ITSS 2015), July 04–10, Madrid, Spain	Galwas B., Madziar K.
[Con34]	38th International Spring Seminar on Electronics Technology (ISSE 2015), May 06–10, Eger, Hungary	Kisiel R., Myśliwiec M.
[Con35]	European Materials Research Society 2015 Fall Meeting Symposium F: Materials and cootings for extreme environments (E-MRS 2015 Fall Meeting), September 15–18, Warsaw, Poland	Mroczyński R.
[Con36]	Interdisciplinary meeting, CEZAMAT, April 02, Warsaw, Poland	Jasiński J., Mazurak A., Mroczyński R.
[Con37]	KEUDOS Plus Workshop (KEUDOS 2015), November 07–09, Budapest, Hungary	Mroczyński R., Szczepański P.

[Con38]	KNU Research Meeting (2015 KNU), July 09, Daegu, South Korea	Mroczyński R.
[Con39]	The Fifth International Workshop on Advanced Spectroscopy and Optical Materials (IWASOM'2015), July 19–24, Gdańsk, Poland	Anders K., Fetliński B., Jusza A., Kaczkan M., Krysiński R., Malinowski M., Piramidowicz R.
[Con40]	The International Workshop on Integrated Nonlinear Microwave and Millimetre-wave Circuits (INMMiC 2015), October 01–02, Taormina (Messina), Italy	Madziar K.
[Con41]	XIII Seminarium Powierzchnia i Struktury Cienkowarstwowe (SemPiSC 2015), September 16–18, Szklarska Poręba Średnia, Poland	Janaszek B., Piekarski R., Szczepański P.

11. AWARDS

[Award1] Michał Borecki, Jan Szmidt, Michael L. Korwin-Pawłowski, Andrzej Kociubiński, Mariusz Duk, Jarosław Frydrych, Przemysław Prus, **Best Paper Award at The Fourth International Conference on Sensor Device Technologies and Applications SENSORDEVICES 2015 for "Capillary Rise Multiparametric Sensor for Testing of Diesel and Biodiesel Fuel"** (Nagroda za najlepszą pracę pt. "Capillary Rise Multiparametric Sensor for Testing of Diesel and Biodiesel Fuel" podczas konferencji SENSORDEVICES 2015, The Fourth International Conference on Sensor Device Technologies and Applications), 28 August 2015

[Award2] Piotr Firek, Jakub Jasiński, Jerzy Kalenik, Mariusz Sochacki, Mateusz Śmietana, Aleksander Werbowy, Michał Borecki, Ryszard Biaduń, Witold Ciemiewski, Kazimierz Dalbiak, Elżbieta Czerwosz, Ewa Kowalska, Mirosław Kozłowski, Konrad Kiełbasiński, Mateusz Mroczkowski, **WUT Rector's Collective Award for for Scientific Achievements (1st stage)**, (Nagroda zespołowa I stopnia JM Rektora Politechniki Warszawskiej za działalność naukową), 1 October 2015

[Award3] Wiesław Kuźmicz, **WUT Rector's Individual Award for Scientific Achievements (1st stage)** (Nagroda Indywidualna I stopnia JM Rektora Politechniki Warszawskiej za osiągnięcia naukowe), 1 October 2015

[Award4] Robert Mroczyński, **Award for the lecture: Fundamentals of Semiconductor Technologies during International Summer School of KyungPook National University** (Wyróżnienie za opracowanie autorskiego przedmiotu i prowadzenie wykładów: Fundamentals of Semiconductor Technologies w trakcie International Summer School of KyungPook National University), 9 July 2015

[Award5] Marcin Myśliwiec, Arkadiusz Lewandowski, Wojciech Wiatr, Jerzy Weremczuk, Zbigniew Szczepański, Ryszard Kisiel, **Best Posters Awards for the poster "Challenges in packaging of IR detectors – technology of elastic electrical connections" at 39th International Microelectronics and Packaging Conference IMAPS-CPMT Poland 2015** (Nagroda za najlepszą pracę pt. "Challenges in packaging of IR detectors – technology of elastic electrical connections" na konferencji IMAPS-CPMT Poland 2015, 39th International Microelectronics and Packaging Conference), 23 September 2015

[Award6] Witold Pleskacz, Dominik Krzysztof Kasprowicz, Adam Wojtasik, Katarzyna Trzaskowska, Marek Ciepłucha, Grzegorz Janczyk, Jakub Kopański, Arkadiusz Władysław Łuczyk, Krzysztof Marcinek, Paweł Narczyk, Krzysztof Siwiec, **WUT Rector's Collective Award for Organizing Achievements (2nd stage)** (Nagroda zespołowa II stopnia JM Rektora Politechniki Warszawskiej za osiągnięcia organizacyjne „Współorganizowanie konferencji DDECS 2014"), 1 October 2015

[Award7] Witold Pleskacz, Krzysztof Siwiec, Krzysztof Marcinek, Paweł Narczyk, Tomasz Borejko, Jakub Kopański, Andrzej Wielgus, Maciej Plasota, Piotr Boguszewicz, Aleh Halauko, **GOLD MEDAL with honors at the World Exhibition on Inventions, Research and New technologies BRUSSELS INNOVA 2015 for "Microchip based system for monitoring of psychological and physical parameters of patients under dynamic WBAN conditions"** (ZŁOTY MEDAL z wyróżnieniem na Międzynarodowych Targach Wynalazczości, Badań Naukowych i Nowych Technologii, BRUSSELS INNOVA 2015 za wynalazek "System Monitorowania parametrów psychofizycznych pacjentów w warunkach dynamicznych WBAN, oparty na technologiach mikroukładowych", opracowany w ramach wspólnego projektu Instytutu Techniki i Aparatury Medycznej ITAM, Politechniki Warszawskiej i Wojskowego Instytutu Medycyny Lotniczej WIML, NCBR Nr PBS1/B3/13/2012 – BIOSIP), 21 November 2015

[Award8] Witold Pleskacz, Krzysztof Siwiec, Krzysztof Marcinek, Paweł Narczyk, Tomasz Borejko, Jakub Kopański, Andrzej Wielgus, Maciej Plasota, Piotr Boguszewicz, Aleh Halauko, **GOLD MEDAL at the International Invention Show INOVA CROATIA 2015 for "Microchip based system for monitoring of psychological and physical parameters of patients under dynamic WBAN conditions"** (ZŁOTY MEDAL na Międzynarodowych Targach Wynalazczości INOVA CROATIA 2015 za wynalazek "System Monitorowania parametrów psychofizycznych pacjentów w warunkach dynamicznych WBAN, oparty na technologiach mikroukładowych", opracowany w ramach wspólnego projektu Instytutu Techniki i Aparatury Medycznej ITAM, Politechniki Warszawskiej i Wojskowego Instytutu Medycyny Lotniczej WIML, NCBR Nr PBS1/B3/13/2012 – BIOSIP), 7 November 2015

[Award9] Krzysztof Siwiec, URSI Young Scientist Award for "A Low Phase Noise Low Power Fractional-N Synthesizer Architecture" at **1st URSI Atlantic Radio Science Conference (URSI AT-RASC)** (Nagroda dla Młodego Naukowca za pracę pt. "A Low Phase Noise Low Power Fractional-N Synthesizer Architecture" na koneferncji 1st URSI Atlantic Radio Science Conference (URSI AT-RASC)), 24 May 2015

[Award10] Krzysztof Siwiec, Krzysztof Marcinek, Tomasz Borejko, Adam Jarosz, Jakub Kopanski, Ewa Kurjata-Pfitzner, Paweł Narczyk, Maciej Plasota, Andrzej Wielgus,Witold Pleskacz, **Outstanding Paper Award at 22nd International Conference: "Mixed Design of Integrated Circuits and Systems" – MIXDES 2015 for "A CMOS system-on-Chip for Physiological Parameters Acquisition, Processing and Monitoring"** (Nagroda za najlepszą pracę pt. "A CMOS system-on-Chip for Physiological Parameters Acquisition, Processing and Monitoring" na konferencji MIXDES 2015, Mixed Design of Integrated Circuits and Systems), 27 June 2015

[Award11] Stanisław Stopiński, **First prize in the competition Innovator of Mazovia in the category of Innovative Young Scientist for "InP-based photonic integrated circuits for high-speed data readout systems"** (I nagroda w konkursie Innowator Mazowsza w kategorii Innowacyjny Młody Naukowiec za pracę „Opracowanie architektury fotonicznych układów scalonych na bazie fosforku indu (InP) dla szybkich systemów odczytu danych"), 14 December 2015

[Award12] Mateusz Śmietana, **WUT Rector's Individual Award for Scientific Achievements (1st stage)** (Nagroda Indywidualna I stopnia JM Rektora Politechniki Warszawskiej za osiągnięcia naukowe), 1 October 2015

[Award13] Wiesław Woliński, **was given the title of Doctor Honoris Causa of Military University of Technology in Warsaw** (Doktorat honoris causa Wojskowej Akademii Technicznej), 20 November 2015

[Award14] Jerzy Woźnicki, **Gold Medal of the 100th anniversary of the Warsaw University of Technology Renewal of Tradition** (Złoty Medal 100-lecia Odnowienia Tradycji Politechniki Warszawskiej), 18 November 2015

[Award15] Jerzy Woźnicki, **was given the title of Doctor Honoris Causa of University of Warmia and Mazury in Olsztyn** (Doktorat honoris causa Uniwersytetu Warmińsko-Mazurskiego), 3 July 2015