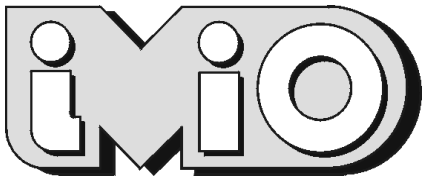
INSTITUTE OF MICROELECTRONICS AND OPTOELECTRONICS



ANNUAL REPORT

2011

Edited by Agnieszka Mossakowska-Wyszyńska

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From the Director

This Annual Report summarizes the research activities of the Institute in 2011, as well as the teaching activities in the academic year 2010/2011. The activities of the Institute in the field of electronics and computer engineering are concentrated in the area of broadly defined microelectronics, optoelectronics and photonics. These include VLSI systems, microelectronic and nanoelectronic semiconductor devices, hybrid circuits (e.g. microwave, optoelectronic), sensors, microsystems, laser optoelectronics, electronic imaging and image processing. It is worth to emphasize that research activities of the Institute span modelling, CAD, manufacturing and diagnostics.

The Institute of Microelectronics & Optoelectronics (IMiO) was founded in 1970. It evolved from the Chair of Radio Engineering established by Professor Janusz Groszkowski in 1929. Our Institute is linked with the beginnings of the Faculty of Electronics and Information Technology through the person of Prof. Groszkowski, who worked in IMiO until his death, as well as the territory – half of the Institute is situated in the Building of Radio Engineering on the Warsaw University of Technology campus. Here the Institute's Technology Centre is located. It includes laboratories of silicon processing (clean-room), hybrid technologies and assembly techniques, fibre optic and integrated optoelectronic device fabrication, laser optoelectronics, characterization of new electronic and photonic materials and manufacturing processes. These laboratories developed their activities based on research projects financed by Polish government as well as those within 6th and 7th UE Framework Programme. The institute is a beneficiary of three investment projects of the Innovative Economy Operational Programme. As a result a 11 high-tech laboratories offering high quality scientific services in the field of advanced electronic and photonic technologies are being established in IMiO. All of these labs are expected to reach their full operational readiness by the end of 2012 .

In the field of teaching (three-level structure – B.Sc., M.Sc. and Ph.D. studies) the Institute continued to improve its contribution in the Electronics and Computer Engineering area (led together with the Institute of Electronic Systems) for on-campus studies. The involvement of the Institute in distance learning studies of Electronics and Telecommunications is also worth mentioning, especially post-diploma studies in the domain of tools and techniques of virtual education that began in 2004. Since 2009 IMiO provides a teaching program for the students of the Faculty of Management with the aim of educating future managers of electronic equipment production.

IMiO inspired and was actively involved in the organization of a series of popular-science lectures aimed to encourage secondary-school students to continue their education at our Faculty. The Institute aims for its teaching activities to meet the challenge of the development of modern technology and information society.

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

Warsaw, January 2011

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

CONTENTS:

1. GENERAL INFORMATION

1.1. Organisation of the Institute and Areas of its Activities

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

Our Institute consists of five divisions:

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

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

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

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

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

1.2. Board of Directors

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1.3. Microelectronics and Nanoelectronics Devices Division

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Robert Mroczyński, Ph.D.	Assistant Professor
Zbigniew Pióro, Ph.D.	Assistant Professor
Sławomir Szostak, Ph.D.	Assistant Professor
Jakub Walczak, Ph.D.	Assistant Professor
Agnieszka Zaręba, M.Sc.	Assistant Professor
Jan Gibki, Ph.D.	Senior Lecturer
Józef Maciak, M.Sc.	Senior Lecturer
Antoni Siennicki, Ph.D.	Senior Lecturer

Junior academic staff

Jakub Jasiński, M.Sc.	Assistant
Arkadiusz Malinowski, M.Sc.	Ph.D. Student
Paweł Sałek, M.Sc.	Ph.D. Student
Dominik Tanous , M.Sc.	Ph.D. Student

Technical and administrative staff

Witold Ciemiewski,
Krzysztof Krogulski,

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

To name a few examples of its research topics:

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

1.4. VLSI Engineering and Design Automation Division

Head of the Division

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Grzegorz Janczyk, Ph.D.	Assistant Professor
Zbigniew Jaworski, Ph.D.	Assistant Professor
Dominik Kasprowicz, Ph.D.	Assistant Professor
Marek Niewiński, Ph.D.	Assistant Professor
Andrzej Wielgus, Ph.D.	Assistant Professor
Adam Wojtasik, Ph.D.	Assistant Professor

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Michał Bryk, M.Sc.	Ph.D. Student
Jacek Grądzki, M.Sc.	Ph.D. Student
Andrzej Grodzicki, M.Sc.	Ph.D. Student
Aleksander Koter, M.Sc.	Ph.D. Student
Arkadiusz Łuczyk, M.Sc.	Assistant
Krzysztof Marcinek, M.Sc.	Ph.D. Student
Piotr Mierzwiński, M.Sc.	Ph.D. Student
Paweł Narczyk, M.Sc.	Ph.D. Student
Krzysztof Siwiec, M.Sc.	Ph.D. Student
Michał Staniewski, M.Sc.	Ph.D. Student

Technical and administrative staff

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

The research carried out in the division falls into several main areas: development of IC design methodologies and tools, design of digital and analog integrated circuits for nonstandard demanding applications, investigations of new devices and circuits for future generations of microelectronic systems.

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, RF front ends for wireless data transmission etc.,
- modeling and control of leakage currents in nanometer CMOS digital circuits,
- Investigations of new VESTIC microelectronic technology.

1.5. Image and Microwave Photonics Division

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Piotr Garbat, Ph.D.	Assistant Professor
Jerzy Piotrowski, Ph.D.	Assistant Professor
Marek Sutkowski, Ph.D.	Assistant Professor
Agnieszka Szymańska, Ph.D.	Assistant Professor
Piotr Witoński, Ph.D.	Assistant Professor
Jerzy Skulski, M.Sc.	Senior Lecturer

Junior academic staff

Krzysztof Madziar, M.Sc.	Assistant

Technical and administrative staff

Jerzy Domański, M.Sc.
Bożena Janus

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

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

1.6. Electronic Materials and Microsystem Technology Division

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Mikołaj Baszun, Ph.D.	Assistant Professor
Piotr Firek, Ph.D.	Assistant Professor
Jerzy Kalenik, Ph.D.	Assistant Professor
Zdzisław Mączeński, Ph.D.	Assistant Professor
Stanisław Pietruszko, Ph.D.	Assistant Professor
Mateusz Śmietana, Ph.D.	Assistant Professor
Aleksander Werbowy, Ph.D.	Assistant Professor

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Piotr Knyps, M.Sc.	Ph.D. Student
Krystian Król, M.Sc.	Ph.D. Student
Norbert Kwietniewski, M.Sc.	Ph.D. Student
Mateusz Mroczkowski, M.Sc.	Assistant, Ph.D. Student
Andrzej Stefański, M.Sc.	Ph.D. Student
Andrzej Taube, M.Sc.	Ph.D. Student

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Mariusz Sochacki, Ph.D.	Assistant Professor

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Technical and administrative staff
Ryszard Biaduń.

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

The main research areas are as follows:

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

1.7. Optoelectronics Division

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Agnieszka Mossakowska-Wyszyńska, Ph.D.	Assistant Professor
Ryszard Piramidowicz, Ph.D.	Assistant Professor
Anna Tyszka-Zawadzka, Ph.D.	Assistant Professor
Piotr Warda, Ph.D.	Assistant Professor

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Paweł Gdula, M.Sc.	Ph.D. Student
Bartosz Fetliński, M.Sc.	Ph.D. Student
Anna Jusza, M.Sc.	Ph.D. Student
Katarzyna Ławniczuk, M.Sc.	Ph.D. Student
Stanisław Stopiński, M.Sc.	Ph.D. Student
Katrin Welikow, M.Sc.	Ph.D. Student

Technical and administrative staff
Maciej Juźwik, M.Sc.
Wojciech Kamiński, Ph.D.
Ewa Piórecka, M.Sc.

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

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.

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

The main research activity of the Division comprises:

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

1.8. Statistical Data

SPECIFICATION	2010	2011	DIFFERENCE
Academic staff	93	84	-9
Tenured professors	10	10	0
Professors	3	6	+3
Docent	1	1	0
Assistant professors	34	31	-3
Senior lecturers	4	4	0
Assistants and Ph.D. students	41	32	-9
Science research staff	7	6	-1
Technical and Administrative staff	22	22	0
Computers	380	265	-115
Library resources - Books (number of volumes)	3597	3625	+28
Teaching activities	69	66	-3
Basic courses	31	31	0
Advanced courses	16	16	0
Special courses	22	19	-3
Research projects	43	39	-4
Granted by the University	6	6	0
Granted by State Institutions	28	23	-5
Granted by International Institutions	8	9	+1
Others projects	1	1	0
Degrees awarded	59	55	-4
D.Sc. degrees	1	2	+1
Ph.D. degrees	4	4	0
M.Sc. degrees	17	20	+3
B.Sc. degrees	37	29	-8
Publications	151	159	+8
Sci.-tech. books	8	7	-1
Sci.-tech. papers in journals	40	84	+44
Sci.-tech. papers in conference proceedings	103	68	-35
Patents	3	7	+4
Conferences	33	35	+2
Awards	14	9	-5

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 Award (‘06), President’s of the Republic of Poland Gold Medal for Long-Term Service (‘08).

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Vice-Chairman of the Electronics and Telecommunications Committee of the Polish Academy of Sciences, Head of its Microelectronics Section (‘88-03), Pożaryski Award for Scientific Publications (‘86, ‘96), Member of Programme Committee of ELTE (‘84-), MiEL (‘94-), IWSPD (‘96-), MIXDES (‘97-), IEEE ICCDS (‘02-), Chairman of “Diagnostic and Yield” (‘88-), Editor-in-chief of “Electron Technology” (‘90-’94), WUT Rector’s Collective Award for Scientific Achievements (‘08).

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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).

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2.3. Science Research Staff

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Wojciech Kamiński	Ph.D.	Senior Research Worker	+48 222347145
Mariusz Sochacki	Ph.D.	Science Assistant Professor	+48 222347932
Katrin Welikow	M.Sc.	Design Engineer	+48 222345047

2.4. Technical and Administrative Staff

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Jadwiga Radzyńska		Secretary	+48 222347777
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Katarzyna Trzaskowska	M.A.	Administrative Specialist	+48 222347776
Robert Uklański	M.Sc.	Administrative Specialist	+48 222347949

3. TEACHING ACTIVITIES

3.1. Basic Courses

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

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

[Edu3] **Computer-Aided Design of Printed-Board Circuits** (Wspomaganie komputerowe projektowania obwodów drukowanych), **PADS**, Ryszard Kisiel, Jerzy Kalenik

[Edu4] **Characterization of Microelectronic Structures and Technologies** (Charakteryzacja struktur i technologii mikroelektronicznych), **CSTM**, Bogdan Majkusiak

[Edu5] **Design of Analog Circuits for VLSI Systems** (Projektowanie układów analogowych dla systemów VLSI), **PUAV** Wiesław Kuźmicz

[Edu6] **Digital Circuits** (Układy cyfrowe), **UCYF**, Elżbieta Piwowarska

[Edu7] **Electronic Elements and Circuits** (Elementy i układy elektroniczne), **ELIU**, Andrzej Pfitzner

[Edu8] **Electronics 1** (Elektronika 1), **ELE1**, Andrzej Jakubowski, Sławomir Szostak

[Edu9] **Electronics 2** (Elektronika 2), **ELE2**, Zbigniew Pióro

[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**, Bogdan Galwas

[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, Agnieszka Mossakowska-Wyszyńska

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

[Edu22] **Introduction to Programming** (Podstawy programowania), **PRM**, Michał Borecki

[Edu23] **Introduction to the UNIX System** (Użytkowanie systemu UNIX), **USUX**, Andrzej Wielgus

[Edu24] **Introduction to Numerical Methods** (Wstęp do metod numerycznych), **WDMNM**, Jerzy Krupka

[Edu25] **Object Programming in Java** (Praktyka programowania obiektowego w Javie), **PPOJ**, Adam Wojtasik

[Edu26] **Object Programming** (Programowanie obiektowe), **PROE**, Adam Wojtasik

[Edu27] **Operating Systems** (Systemy operacyjne), **SOE**, Andrzej Wielgus

[Edu28] **Optoelectronic Devices and Systems** (Elementy i systemy optoelektroniczne), **ESO**, Michał Malinowski

[Edu29] **Physical Fundamentals of Information Processing** (Fizyczne podstawy przetwarzania informacji), **FPPI**, Bogdan Majkusiak

[Edu30] **Programming microcontrollers in C language** (Programowanie mikrokontrolerów w języku C), **PMIK**, Sławomir Szostak

[Edu31] **Semiconductor Devices** (Przyrządy półprzewodnikowe), **PP**, Andrzej Jakubowski, Andrzej Pfitzner

3.2. Advanced Courses

[Edu32] **Advanced Lightwave Telecommunication** (Zaawansowana telekomunikacja optofalowa), **ZTEOP**, Bogdan Galwas

[Edu33] **Advanced Microelectronic and Optoelectronic Technologies** (Zaawansowane technologie mikroelektroniczne i optoelektronczne), **ZTMO**, Romuald Beck

[Edu34] **Advanced Physical Fundamentals of Optoelectronics** (Zaawansowane podstawy fizyczne optoelektroniki), **ZPFO**, Paweł Szczepański

[Edu35] **Digital Image Processing** (Cyfrowe przetwarzanie obrazów), **CPOO**, Piotr Garbat

[Edu36] **Electronic and Photonic Devices for Telecommunication** (Przyrządy elektroniki i fotoniki dla telekomunikacji), **PEFT**, Bogdan Galwas

[Edu37] **Fundamentals of Photovoltaics** (Podstawy fotowoltaiki), **PFOT,** Stanisław Pietruszko

[Edu38] **Integrated and Logic Circuits for Optoelectronics** (Zintegrowane układy optoelektroniczne i optyczne układy logiczne), **ZOUL**, Michał Malinowski

[Edu39] **Monte Carlo Methods - Fundamentals and Applications** (Metody Monte Carlo - podstawy i zastosowania), **MMC**, Marek Niewiński

[Edu40] **Nanostructures and Nanosystems** (Nanostruktury i nanosystemy), **NIN**, Jan Szmidt, Aleksander Werbowy

[Edu41] **Nanotechnologies** (Nanotechnologie), **NAN**, Jan Szmidt

[Edu42] **Optical Waveguide Lasers and Amplifiers**(Wzmacniacze i lasery światłowodowe), **WLS**, Ryszard Piramidowicz

[Edu43] **Optoelectronics Techniques of Information Processing** (Optoelektroniczne techniki przetwarzania informacji) ,**OTZI**, Janusz Parka, Jerzy Woźnicki

[Edu44] **Photovoltaic Systems** (Systemy fotowoltaiczne), **SFOT,** Stanisław Pietruszko

[Edu45] **Semiconductor Structures for VLSI and ULSI Circuits** (Struktury półprzewodnikowe dla układów VLSI i ULSI), **SPVU**, Andrzej Jakubowski

[Edu46] **Vision Monitoring Systems** (Systemy monitoringu wizyjnego), **SYMW**, Jerzy Woźnicki

[Edu47] **VLSI System Design** (Projektowanie systemów scalonych w technice VLSI), **PSSV**, Wiesław Kuźmicz, Zbigniew Jaworski

3.3. Courses in English

[Edu48] **Electronics 1, EELE1,** Bogdan Majkusiak

[Edu49] **Laser Techniques, Faculty of Mechatronics**, **LT**, Anna Tyszka Zawadzka

[Edu50] **Physics 3, EPHY3,** Bogdan Majkusiak

[Edu51] **Quality Management, EQUMA,** Zdzisław Mączeński

3.4. Courses for other Faculties

[Edu52] **Bases of Automation, Faculty of Management,** (Podstawy automatyzacji, Wydział Zarządzania), **POAUT**, Mikołaj Baszun

[Edu53] **Ecologic aspects of Electronic Material and Equipment Production, Faculty of Management** (Ekologiczne aspekty produkcji materiałów i urządzeń elektronicznych, Wydział Zarządzania), **INMAS**, Ryszard Kisiel

[Edu54] **Electomagnetic Compatibility, Faculty of Management** (Kompatybilność elektromagnetyczna, Wydział Zarządzania), **KOMEL**, Jerzy Piotrowski

[Edu55] **Electronic Circuits and the Introduction to Microelectronics, Faculty of Management** (Układy elektroniczne i wstęp do mikroelektroniki, Wydział Zarządzania), **UEMIK**, Sławomir Szostak

[Edu56] **Electronic Equipment Assembly Processes, Faculty of Management,** (Inżynieria montażu urządzeń elektronicznych, Wydział Zarządzania), **IMUEL**, Ryszard Kisiel

[Edu57] **Electronic Equipment Design Techniques, Faculty of Management, (**Techniki konstrukcji urządzeń elektronicznych, Wydział Zarządzania), **TKUE**, Ryszard Kisiel

[Edu58] **Electronic Material and Structure Production Engineering, Faculty of Management** (Inżynieria produkcji materiałów i struktur elektronicznych, Wydział Zarządzania), **INMAS**, Mikołaj Baszun

[Edu59] **Fundamentals of Devices, Circuits and Systems Technology, Faculty of Management, (**Podstawy technologii przyrządów, układów i systemów, Wydział Zarządzania**), POTPU**, Robert Mroczyński

[Edu60] **Introduction to Microprocessor Systems, Faculty of Management** (Wstęp do systemów mikroprocesorowych, Wydział Zarządzania**), WSMIK**, Zbigniew Pióro

[Edu61] **Laser Technology, Faculty of Physics** (Technika Laserów, Wydział Fizyki), **TL**, Ryszard Piramidowicz

[Edu62] **Logic Circuits, Faculty of Management** (Układy logiczne, Wydział Zarządzania), **UKLO**, Piotr Firek

[Edu63] **Methods of Electronic Element Diagnostics, Faculty of Management** (Metody diagnostyki elementów elektronicznych, Wydział Zarządzania), **MEDEL**, Jan Gibki

[Edu64] **Nanotechnologies, Faculty of Management** (Nanotechnologia, Wydział Zarządzania), **NANOT**, Aleksander Werbowy

[Edu65] **Photonic Devices, Faculty of Management** (Elementy fotoniczne, Wydział Zarządzania), **ELFOT**, Ryszard Piramidowicz

[Edu66] **Printed Cricuit Board Design, Faculty of Management, (**Projektowanie obwodów drukowanych, Wydział Zarządzania), **PRODRU**, Jerzy Kalenik

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, June 2010 - March 2011, **sub-projects:**

[Pro1.1] **Application of ultra-shallow fluorine implantation to increasing MOS structures radiation damage hardness against high energy electrons (1MeV)** (Zastosowanie ultra-płytkiej implantacji fluoru do podniesienia odporności struktur MOS na radiację wysoko energetycznymi (1MeV) elektronami), project leader: Romuald B. Beck

The project aims in experimental study of the consequences of exposure of silicon surface to r.f. fluorine containing plasma. Such process has been proved to allow for ultra-shallow implantation of fluorine, under certain circumstances achieving concentrations of the order of $10^{19}cm^{-3}$. It has been found that presence of fluorine in the gate stack region reduces significantly the degradation due to high energy (1MeV) electrons irradiation. The ultimate goal is finding correlations between irradiation effects and concentration and position of the fluorine profile.

[Pro1.2] **Constructions and materials analysis for microsystems sensing** (Analiza konstrukcji i materiałów dla mikrosystemowych technik sensorowych), project leader: Jan Szmidt

This grant considers research, of the current state of the art of fiber-optic capillary sensors and related instrumentation as well as their applications, with special emphasis on point-of-care chemical and biochemical sensors, systematizing the various types of sensors from the point of view of the principles of their construction and operation. Unlike classical fiber-optic sensors which rely on changes in light propagation inside the fiber as affected by outside conditions, optical capillary sensors rely on changes of light transmission in capillaries filled with the analyzed liquid, which opens the possibility of interesting new applications, while raising specific issues relating to the construction, materials and instrumentation of those sensors. We examine polymer–ceramic composites materials for their dielectric, mechanical, and thermal properties as well as low loss dielectric samples covered with thin metal patterns consisting split-ring resonators SRRs, creating a regular hexagonal lattice. In order to determine the two complex quantities, namely the effective permittivity and the effective permeability of materials samples have been tested using the split post dielectric resonator (SPDR) method.

[Pro1.3] **Development of CAD tools for multiprocessor and distributed computing environments** (Rozwój oprogramowania CAD pracującego w trybie wieloprocesorowym i rozproszonym), project leader: Wiesław Kuźmicz

The goal of the project is to develop new versions of CAD tools (from the IMiOCAD toolset for integrated circuit design and verification), which would take advantage of the computing power of two computer clusters existing in the VLSI engineering group. The works will include such topics as:

- parallelization of the algorithms,
- optimal task assignment,
- synchronization of tasks and processes,
- synchronization of communication between computers in the cluster,
- assessment of the efficiency of various synchronization strategies.

The final outcome expected are versions of the CAD software that will run in the mutitaksing, multiprocessor and distributed computing environments.

[Pro1.4] **Experimental study of the use of photonic technology in microwave oscillator circuits and the analysis of 3D structures using liquid crystal polarizing filter** (Wykorzystanie technik fotonicznych w układach oscylatorów mikrofalowych oraz analiza struktur 3D za pomocą filtra ciekłokrystalicznego), project leader: Janusz Parka

The project aims in experimental study of the use of photonic technology in microwave oscillator circuits and the analysis of 3D structures using liquid crystal polarizing filter. Research will be carried out on the use of photonic technology in microwave oscillator circuits. Application properties and possibility of improving parameters of this type device are considered. Development of 3D data acquisition methods for structures with strong polarization and analysis in order to detect defects and identify structure.

[Pro1.5] **Modeling and investigation of microphotonic structures and characterization of optically active materials** (Modelowanie, opracowanie i badanie mikro-struktur fotonicznych oraz charakteryzacja ośrodków optycznie aktywnych), project leader: Michał Malinowski

The project is focused on; optical modeling tools for passive and active micro-photonic devices such as; planar and fiber waveguides, amplifiers and lasers, optical modeling tools for 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.

The program includes spectroscopic investigations of rare-earth activated solids for technological and biological applications. This concernes bulk monocrystalline, nanocrystalline and glassy matrix for various phosphors, including white light and up-conversion phosphors, sensors, photovoltaics, lasers and amplifiers.

[Pro1.6 **Spectral conversion for solar cells using lanthanide ions** (Konwersja widma słonecznego w systemach fotowoltaicznych z wykorzystaniem jonów ziem rzadkich), project leader: Michał Malinowski

One of the approaches to increase the solar cell efficiency is to change the solar spectrum via spectral up- or down-conversion. In up-conversion two infrared photons that would otherwise be transmitted through the cell are added up to one visible photon, that can be absorbed by the solar cell. Down-conversion is the reverse process when one high energy photon is cut into two infrared photons, or down-shifted in energy, that still can be absorbed by the solar cell. It has been shown theoretically that for ideal up-and down-conversion materials, a maximum efficiency of about 50% and 40% can be achieved, respectively. The project includes spectroscopic investigations of rare-earth activated nano-crystalline solids embedded in glassy or plastic matrix. Multi-ion and multi-photon processes in selected systems such as Er, Tm, Ho, Dy, Tb and Yb doped YO, YAG and YAM nano-powders have been studied.

[Pro2] **The Development of Design, Processing and Testing Methods of the Electronic Devices and Materials for Microelectronics and Optoelectronics** (Rozwój metod wytwarzania i badania materiałów oraz modelowania i charakteryzacji przyrządów w dziedzinie mikroelektroniki i optoelektroniki), project leader: Paweł Szczepański, June 2011 - March 2012, **sub-projects:**

[Pro2.1] **Development of layout editing software for VESTIC integrated circuits** (Oprogramowanie do projektowania topografii układów scalonych VESTIC) project leader: Wiesław Kuźmicz

In this project a new layout editor dedicated for VESTIC integarted circuits will be developed. This editor must allow to design and verify layouts that include shapes such as circles and semi-circles, non-Manhattan paths, rectangles with rounded corners. Such shapes do not appear in traditional CMOS layouts. In addition, accuracy below 1 nm is required. This new layotu editor will be based on a new layout data structures and new layout transformation algorithms.

[Pro2.2] **Modeling and investigation of optically active photonic materials and micro- and nano-structures** (Modelowanie i badanie aktywnych optycznie mikro- i nano-struktur oraz materiałów fotonicznych), project leader: Michał Malinowski

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

[Pro2.3] **Self-aligned gate MOSFET test structures technology** (Struktury testowe MOSFET w technologii samocentrującej bramki),project leader: Romuald B. Beck

The aim of this project is to design and fabricate test structures that enable tuning the self-aligned gate MOSFET technology based on refractory metals. Using these structures the process flow for such a technology will be optimized.

[Pro2.4] **Structures and materials for sensor microsystems technology** (Konstrukcje i materiały dla mikrosystemowych technik sensorowych), project leader: Jan Szmidt

[Pro2.5] **The use of photonic techniques in microwave filters applications and investigations of 3D imaging systems** (Wykorzystanie technik fotonicznych w układach filtrów mikrofalowych oraz badanie parametrów systemów obrazowania 3D), project leader: Janusz Parka

The project aims in experimental study of the use of photonic technology in microwave filters circuits. Microwave photonic filters are recently under interest due to uncomplicated tuning possibilities, easy reconfiguration, immunity for external distortions and wide frequency range of operation. Application properties and modeling of such microwave filters will be under investigation. Several microwave-photonic filter setups will be measured and characterized.

Novel 3D imaging techniques with use of LC devices are investigated. Advanced implementation of numerical procedures in data acquisition and image processing using dedicated hardware processors is examined.

[Pro3] **Autopilot system and image acquisition to a universal platform flying 'quadcopter,' project of WUT Students Association of Microsystems ONYKS** (System autopilota i akwizycji obrazu do uniwersalnej platformy latającej „quadcopter," projekt Koła Naukowego Mikrosystemów ONYKS), project leader: Zbigniew Pióro, June 2011 – December 2011

[Pro4] **Development of the technology and characterization of thin-film transistor (TFT), project of WUT Students Association of Microelectronics and Nanoelectronics** (Opracowanie technologii i charakteryzacja struktur tranzystorów cienkowarstwowych (TFT), projekt Koła Naukowego Mikroelektroniki i Nanoelektroniki), project leader: Mateusz Śmietana, June 2011 – December 2011

[Pro5] **Fiber based sensing system remotely supplied with optical power, project of WUT Students Association of Optoelectronics** (Światłowodowy system czujnikowy zasilany zdalnie mocą optyczną, projekt Koła Naukowego Optoelektroniki),project leader: Ryszard Piramidowicz, co-workers: Krzysztof Anders, Bartosz Fetliński, Anna Jusza, Paweł Gdula, Katrin Welikow, Piotr Florczyk, Paweł Kluz, Łukasz Sudoł, Arkadiusz Szydlik, June 2011 – December 2011

The aim of the following project was to design and develop the sensing system, powered optically by a minimized number of fibers. The proposed solution was then optimized by means of power consumption and architecture's flexibility. Performed tests confirmed practical application of designed system, as well as possibility of its implementation in modern sensor systems.

[Pro6] **Implementation of HDR methods in video security systems, project of WUT Students Scientific Club of Imaging** (Implementacja metod HDR w systemach bezpieczeństwa, projekt Obrazowego Koła Naukowego „Ok-o"), project leader: Marek Sutkowski, co-workers: Damian Drewulski, Łukasz Hołownia, Michał Laskowski, Marcin Śpiewak, September 2011 – December 2011

The goal of this work was to develop software procedures that allow to realize an HDR (High Dynamic Range) imaging in video security systems. In this application a real time (or quasi real time) operation is necessary. To increase the calculation time the HDR procedure was applied to FPGA board (Altera Cyclone II unit).

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

[Pro7] **Design and manufacturing of complete microwave sensor based measurement system intended for electromagnetic properties investigations of grapheme,** (Opracowanie systemu z mikrofalową głowicą pomiarową w postaci rezonatora dielektrycznego do badań właściwości elektrycznych grafenu), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jerzy Krupka, October 2010 – March 2013

The main goal of this project is to design and manufacture of complete apparatus for contactless sheet resistance and conductivity measurements of epitaxial graphene. The most important parts of the system are microwave sensors with dielectric resonators that allow measurements of graphene deposited on a small 10 mm x 10 mm semi-insulating silicon carbide substrates. Three different microwave heads will be constructed. In the addition automatic vector network analyser will be purchased which is intended for the resonance frequency and Q-factor measurement of microwave sensors. For each measurement head appropriate software based on numerical solutions of Maxwell's equations will be developed which is necessary for the determination of the electromagnetic material properties such as the sheet resistance from measurement data.

[Pro8] **Emission properties of the active hybrid eutectic materials (**Właściwości emisyjne aktywnych eutektyków hybrydowych**),** Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Marcin Kaczkan, May 2010 – November 2011

The aim of the project is to investigate and analyze spectroscopic properties of optically active micro- and nano-materials. These type of structures are interesting as host materials, in which active ions may have different properties compared to those they have in bulk crystals. In particular, influence of the eutectic structure properties on the rare-earth ions behavior will be investigated. Emission properties of the Pr^{3+} and Er^{3+} active ions in $SrTiO_3$-TiO_2 oxide-oxide eutectic will be examined with the help of high-resolution laser spectroscopy. Additionally, the spectroscopic analysis for the bulk crystals with the same structures as constituents of eutectic will be perform. This analysis will enable determination of the influence of eutectic structure on the electron relaxation processes in the excited active ions.

Results of the project will enhance the knowledge about processes occurring in solid-state active media which have never been investigated in this manner.

[Pro9] **Feasibility study of the novel nanometric silicon transistors and modelling of them for computer aided design of integrated circuits,** (Badania właściwości nanometrowych tranzystorów krzemowych o nowej konstrukcji i ich modelowanie dla potrzeb wspomagania projektowania (CAD) układów scalonych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Andrzej Pfitzner , April 2010 – April 2012

The goal of this project is a feasibility study of the field-effect and bipolar transistors as the devices of novel technology: *Vertical Slit Transistor based Integrated Circuits* (VeSTICs), proposed by W. Mały. Original geometry of the devices of vertical nanometric active region and symmetrically placed vertical volume contacts allows to reach extremely regular layout of the circuit, better heat transfer, larger scale of integration and even real 3D integration. Project includes optimization of the devices design, especially of the new, twin gate junction-less transistor *Vertical-Slit Field-Effect Transistor* (VeSFET) with regard to chosen electrical parameters, and development of the analytical models destined to circuit simulation.

[Pro10] **Growth of the AlGaN/GaN/SiC-based semiconductor heterostructures by vapour phase epitaxy for the HEMTs applications**, (Wytwarzanie heterostruktur półprzewodnikowych AlGaN/GaN/SiC metodą epitaksji z fazy gazowej na potrzeby konstrukcji tranzystorów z dwuwymiarowym gazem elektronowym (HEMT)), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jan Szmidt, April 2010 – February 2011

The growth conditions of GaN-on-SiC MetalOrganic Vapour Phase Epitaxyhas been determined as well as AlN wetting layer growth conditions. Effect of growth pressure on coalescence thickness and crystal quality of GaN deposited on 4H-SiC has been investigated. HEMTs (AlGaN/AlN/GaN-based) heterostructure has been grown and characterized. The sample HEMTs epistructures are under processing of the devices.

[Pro11] **High temperature spectroscopy of rare-earth doped crystals and nanocrystals for luminescence thermometry applications, (**Spektroskopia wysokotemperaturowa kryształów i nanokryształów tlenkowych domieszkowanych jonami ziem rzadkich dla zastosowań w termometrii luminescencyjnej**)** Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Michał Malinowski, August 2009 – February 2012

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

[Pro12] **Investigation of coherent radiation sources for photonic integreated circuits made in SOI technology, (**Badania nad źródłami promieniowania koherentnego dla fotonicznych układów zintegrowanych wykonanych w technologii krzemowej**),** Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Paweł Szczepański, co-workers: R.B.Beck, B.Majkusiak, M.Malinowski, R.Piramidowicz, A.Tyszka-Zawadzka, A.Mossakowska-Wyszyńska, J.Walczak, P.Warda, K.Leśniewska-Matys, M.Koba, R.Mroczyński, October 2010 – October 2013

The aims of the project is to create original models, verified experimentally, describing the properties of radiation sources made in silicon technology and implemented for integrated circuits photonic, to prepare technologies for the implementation of test structures and their implementation, as well as an electrical and optical characterization of structures obtained to verify the theoretical models.

The research focuses on two fully monolithic solutions implemented entirely within the Group IV materials. The first one concerns the generation of Raman radiation in SOI waveguide structure (a "rib") with LED PIN. In this case, the work will involve the development of theoretical models of the radiation generation based on two complementary formalisms, first: the wave approach and the theory of coupled wave modes; second: the transition matrix formalism; for the DFB and DBR laser structures and the structures based on photonic crystals.

The second case relates to nano-electronic and photonic (NEF) silicon structures in which the generation of photons can be caused by the current flow through the pn junction. The structure of metal-SiO2-well quantum-SiO2-Si with the pn junction made on silicon substrate will be analyzed. It is also planned to produce nanocrystallines with various sizes in other types of layers, i.e. silicon nitride and oxide-silicon nitride in order to investigate the changes of the generated radiation wavelength. The resulting structure will be subjected to electrical characterization as well as will be performed the spectral measurements of emitted light. Characteristics obtained will be used for verification of theoretical models.

[Pro13] **Light generation in planar waveguide lasers based on two dimensional photonic crystals** (Generacja promieniowania w falowodowych laserach planarnych wykonanych na bazie dwu-wymiarowych kryształów fotonicznych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Paweł Szczepański, co-worker: Kamila Leśniewska-Matys, March 2009 – March 2011

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

[Pro14] **Modeling and investigation of the double barrier metal-oxide-semicondutor tunnel structures,** (Modelowanie i badanie struktur tunelowych typu metal-izolator-półprzewodnik (MIS) z podwójną barierą potencjału), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Bogdan Majkusiak, co-workers: R.B. Beck, A. Jakubowski, L. Łukasiak, J. Walczak, R. Mroczyński, A. Zaręba, S. Szostak, A Mazurak, J. Grabowski, G. Głuszko, March 2010 – March 2013

The aim of the project is to develop and verify a theoretical model of the double barrier MOS tunnel diode as well to fabricate the test structures and investigate them by means of the theoretical model as a characterization tool.

[Pro15] **Nanostructural carbonaceous films for cold emitters** NANOCAFE – MNT-ERA NET, (Zimne emitery elektronów oparte o nanostrukturalne warstwy węglowe **MNT-ERA NET**), leading institution: Tele- and Radioresearch Institute, task executor: Warsaw University of Technology, Institute of Microelectronics, project leader: Elżbieta Czerwisz, task leader: Jan Szmidt, co-workers: Jerzy Kalenik, Piotr Firek, Mateusz Mroczkowski, Ryszard Biadań, Krystyna Szylko, Krystian Król, March 2009 – February 2011

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

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

[Pro16] **New optoelectronics devices for intelligent classification of organic and biologic liquids.** (Nowe przyrządy optoelektroniczne do inteligentnej klasyfikacji cieczy organicznych i biologicznych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jan Szmidt, November 2010 – October 2013

We highlight the main differences between the liquid classification method proposed in grant and other known methods, pointing out that the proposed microliter photonic sensor setup with local heating and optical capillaries offers a new approach to liquid examination using the index of refraction, turbidity, surface tension, viscosity and vapor pressure as the determining parameters, which can be correlated with biological or chemical information. The novelty of the proposed approach to sensor devices lies in the use of time-domain data and neural network processing, which gives more information about the liquid in question than the traditional static sample examination approach. In the first part of grant, we investigate the operating principles and various aspects of the construction of the optical capillary head. We look at two different cases: (1) transparent liquids and (2) highly turbid liquids, the latter described as an emulsion of particles in a colloidal solution. We go on to examine the possibilities of using replaceable components as a practical means of realizing the systems. The second part of our work considers the principles of optoelectronic intensity signal detection, including the aspects of speed, accuracy and simplicity of the test instrument and ways of reducing the dependence of the sensor's sensitivity on ambient conditions. The principles of sensor operation will be described using two practical examples. The first involves recognition of liquids of different chemical origin containing alcohols and glycols and an examination of the composition of bio-fuels. The second example deals with a new method of mastitis classification using optical capillary sensors. In this context, we discuss the relationship of the physically measured test-cycle data and the proper choice of features for the artificial neural network classification algorithm that we use. We demonstrate that combined biological, chemical and physical analysis also leads to proper feature selection and sample classification.

[Pro17] **Process of spontaneous emission in photonic crystals,** (Proces emisji spontanicznej w kryształach fotonicznych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Paweł Szczepański, co-worker: Adam Rudziński, October 2008 – February 2011

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

[Pro18] **Structural camera 3D-HD** (Strukturalna kamera 3D-HD), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Piotr Garbat, co-worker: Marek Sutkowski, April 2010 – April 2012

Measurement is based on the active fringe projection method and HD-resolution video camera. This solution offers a much shorter measurement time in comparison with measurements using other standard techniques based on structural light methods.

[Pro19] **Technology and characterization of MIS structures with double gate dielectric stacks for non-volatile semiconductor memory (NVSM) applications** (Technologia i charakteryzacja struktur MIS z podwójną warstwą dielektryka bramkowego dla zastosowań w nieulotnych pamięciach półprzewodnikowych (NVSM)), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Robert Paweł Mroczyński, co-workers: Andrzej Jakubowski, Romuald Beck, Agnieszka Zaręba, Sławomir Szostak, Grzegorz Głuszko, Jarosław Grabowski August 2009 – August 2012

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

[Pro20] **The model of radiation generation in photonic crystal laser analysis**, (Model generacji promieniowania w laserach posiadających ośrodek aktywny w postaci kryształu fotonicznego), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Paweł Szczepański, co-worker: Marcin Koba, March 2010 – May 2011

This work introduces the model of light generation in two-dimensional photonic crystal laser. Although this work is limited to two-dimensional structures it remains general and conclusions apply to one- and three-dimensional cases. An approximate model of two-dimensional photonic crystal laser generation at threshold and above threshold has been show. This analysis is based on coupled mode theory and semiclassical theory. Additionally an energy theorem was used to

obtain above threshold characteristics. Presented model takes into account nonlinear dispersion of active medium, gain saturation and mode competition effects. The outcome of calculations is valid for square and triangular lattice photonic crystals. On the basis of presented approximate model an output characteristics of laser operation has been shown. They describe output power in terms of a coupling coefficients and allow to define regions of coupling strength corresponding to maximum power efficiency. Moreover the stability conditions and the characteristics for stable two mode operation has been shown.

[Pro21] **The new optoelectronics method of intelligent classification of liquid bio-fuels properties with optical capillary use** (Nowa metoda optoelektroniczna inteligentnej klasyfikacji właściwości użytkowych biopaliw ciekłych z wykorzystaniem kapilar optycznych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Michał Borecki, March 2009 – March 2012

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

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

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

[Pro22] **Tunable liquid crystal devices working on THz and GHz range,** (Przestrajalne ciekłokrystaliczne przetworniki na zakres THz i GHz.), Consortium: Military University of Technology, Warsaw University of Technology, Polish Academy of Sciences, Wrocław University of Technology, Przemysłowe Centrum Optyki, project leader: Janusz Parka, co-workers: Bogdan Galwas, Marek Sutkowski, Piotr Gabrat, Agnieszka Szymańska, Jerzy Piotrowski, Krzysztof Madziar, December 2010 – December 2012

The main goal of the project is to develop and produce a tunable liquid crystal devices working in 5-100 GHz and 0,3-6 THz ranges. These devices with active area of few sq. centimeters can be applied as tunable phase shifters, phase correctors, modulators etc.

[Pro23] **Universal laser source for medical applications,** (Uniwersalne źródło promieniowania laserowego do zastosowań medycznych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Wojciech Kamiński, March 2009 – March 2012

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

4.3. Projects Granted by National Centre for Research and Development

[Pro24] **Optical fiber sensors with nanofilms for examination of bioliquids** (Nanowarstwowe czujniki światłowodowe do biodiagnostyki cieczy), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Mateusz Śmietana, October 2011- September 2014

The aim of this project is to develop a technology, fabricate and conduct a complex characterization of modern optical fiber sensing structures nanocoated with overlays, which make them possible long-term monitoring of variations in properties of the liquids or state of the sensors' surface. In order to achieve this aim, depending on the foreseen application of the sensors, we will employ various vapor based deposition methods allowing for deposition of a wide range of films, followed by their plasma based processing. There is foreseen two main fields of applications, i.e., liquids containing components of biological origins forming biofilms on the sensor's surface (e.g. antigens, proteins, DNA, enzymes or bacteria) and oily liquids technologically modified (thermally or chemically). It must be noticed, that these liquids differ much, not only from a point of view of their origins, but first of all from the point of view of their physical and chemical properties. That fact forces application of different technology used for deposition and surface processing of the films for each of the applications.

[Pro25] **Dual-mode blocks of the integrated circuit GALILEO and GPS signal receiver in nanometer CMOS technology for precise positioning of mobile objects**, (Bloki dwusystemowego, scalonego odbiornika sygnałów nawigacji satelitarnej GALILEO i GPS w technologii nanometrowej CMOS do dokładnego pozycjonowania obiektów przenośnych) Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Witold Pleskacz, co-workers: Tomasz Borejko, Andrzej Berent, Jacek Grądzki, Aleksander Koter, Wiesław Kuźmicz, Arkadiusz Łuczyk, Krzysztof Marcinek, Krzysztof Siwiec, March 2011 - February 2014

The aim of the project is to design and manufacture IC prototypes of the component blocks of an independent dual receiver for the European satellite navigation system called Galileo as well as for the American GPS-Navstar. The additional goals are to run and characterize a complex electronic system built with above blocks. The designed system will receive navigation data from both satellite systems simultaneously. This will significantly improve the accuracy of positioning and will be invaluable in urban areas where skyscrapers often block the satellite signal from one system. The existence of a second system will be crucial to determine the position and user will not need to worry about which system is currently used.

Positive results of developed solution in industrial environment will begin the process of full silicon integration as a SoC (System on Chip). Practical importance of the project results to industry and the possibility of using the results of the project by other entities will be unquestionable. These include high-tech companies (e.g. microelectronics) and commercial institutions, which are producing and integrating satellite navigation systems in various areas of civil applications where satellite navigation is very quickly gaining new followers and new uses. Designed two-mode receiver (Galileo-GPS) will provide greater accuracy and reliability of measurements compared with single-system receivers (GPS only). This will form the basis for next generation services and applications based on satellite data, which will benefit users from the industry, scientific institutions, public administration as well as individual customers.

4.4. Projects Granted by the National Science Centre

[Pro26] **Highly sensitive ISFET matrix transistors with functional dielectrics on new generation** (Wysokoczułe matryce tranzystorowych struktur typu ISFET z funkcjonalnymi dielektrykami nowej generacji), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Piotr Firek, co-workers: Jan Szmidt, Mateusz Śmietana, Mariusz Sochacki, Aleksander Werbowy, Ryszard Kisiel, Michał Borecki, Robert Mroczyński, Ryszard Jachowicz, jerzy Weremczuk, Daniel Paczesny, Grzegorz Tarapata, Krzysztof Zdunek, Katarzyna Nowakowska-Langier, April 2011- April 2014

The aim of the project is to elaborate of the technology of Ion Sensitive Field Efect Transistor - ISFET) with the gate dielectric layers made of various materials that determine sensitivity of every element of the matrix. There are used common dielectric layers such as: SiO_2, SiO_xN_y, but also these with the specific properties: $BaTiO_3$, HfO_2 which are characterized by the high value of relative dielectric, DLC (Diamond-Like Carbon) that are biocompatible, and the new generation dielectrics with the highly promising properties, such as Al_2O_3 i AlN.

[Pro27] **Implementation of HDR methods in video security systems,** (System pozyskiwania obrazów 3D z analizą polaryzacyjną), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jerzy Woźnicki, co-workers: Marek Sutkowski, Piotr Garbat, Janusz Parka, May 2011 – May 2013

In the work the 3D imaging set-up for shape measurements of the moving objects will be developed and build. During recording process the polarization of the light is analysed. This will allow to use this system in special environment conditions, i.e. dust, steam, fog, smoke.

[Pro28] **New processes and technology for assembly and hermetic SiC high temperature packages** (Nowoczesne procesy i technologie na potrzeby montażu i hermetyzacji elektroniki wysokotemperaturowej na bazie SiC), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Ryszard Kisiel, co-workers: Marek Guziewicz, Włodzimierz Strupiński, Zbigniew Szczepański, Mariusz Sochacki, Jan Szmidt, Piotr Firek, Małgorzata Kalisz, Teodor Paweł Gotszalk, Jarosław Kraśniewski, Aneta Olga Hakpa, Aleksander Werbowy, Maciej Oleksy, April 2011 – April 2014

The aim of the project is to elaborate prototype packages for SiC high temperature devices able to continuous work at 350 °C and short term work at temperature of 500°C. To fulfill these requirements it is necessary to elaborate assembly technology of SiC devices to ceramic substrate as well as electrical package interconnectors that are able to work in such high temperatures.

[Pro29] **The influence of subsurface doping of silicon carbide (4H-SiC) by ion implantation on electrophysical properties of MOS structures fabricated by thermal oxidation** (Wpływ przypowierzchniowego domieszkowania węglika krzemu 4H-SiC techniką implantacji jonów na właściwości elekrofizyczne struktur MOS otrzymywanych w wyniku utleniania termicznego), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jan Szmidt, co-workers: Jerzy Żuk, Jacek Szuber, Bogusława Adamowicz, Mariusz Sochacki, Włodzimierz Strupiński, Małgorzata Kalisz, Piotr Firek, Aleksander Werbowy, Alina Domanowska, Piotr Kościelniak, Norbert Kwietniewski, Krystian Król, April 2011- April 2014

The main objective of the project is primarily to understand the processes taking place in the SiO2/SiC interface in the presence of nitrogen and an explaination of the reasons of the lower density of surface states including gate dielectric technology development towards commercialization of MOSFET transistors. The role of carbon in surafce states creation and the role of nitrogen in reduction of the surface states density including the nature of chemical bonds in the interface will be investigated by profiling X-ray Photoelectron Spectroscopy (XPS) and profiling Auger Electron Microscopy (SAM). The second stream of research is an extraction of electrical parameters of MOS structures and the determination of the relationship between electrical parameters and the fabrication technology. The parameters of thermal oxidation will be proposed to implement the process into simulation software. The electrical simulation will take into account the technology details if the correlation is obtained through the experimental work.

4.5. Projects Granted by International Institutions

[Pro30] **Center of Nanophotonics** (Centrum nanofotoniki), EU structural project, project leader: Paweł Szczepański, co-worker: Ryszard Piramidowicz, 2009 – 2011

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

[Pro31] **Establishing of innovative, complementary laboratories dedicated to advanced research in micro-, nano- and optoelectronics,** (Utworzenie grupy innowacyjnych komplementarnych laboratoriów badawczych w obszarze mikro-, nano- i optoelektroniki), EU structural project, project leader: Paweł Szczepański, co-worker: Ryszard Piramidowicz, 2009 – 2011

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

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

[Pro32] **Future Internet Engineering,** (Inżynieria Internetu Przyszłości), EU Innovative Economy Programme, POIG.01.01.02-00-045/09, project leader: Paweł Szczepański, co-workers: Piotr Witoński, Paweł Gdula, Katrin Welikow, Krzysztof Anders, January 2010 – December 2012

The project covers the development and testing of infrastructure and services for the future generation Internet, i.e. IPv6 Internet and Future Internet. It is expected that new generations of Internet (one of the research priorities in the scope of European Union Framework Programmes) will contribute substantially to civilizational development in Europe by using their capabilities in all or almost all areas of human activity.

The aim of this project, in the scope of IPv6 Internet, is to develop a methodology for the evolutionary replacement of current version of IP (IPv4) in the national network by the IPv6 protocol and to propose new network solutions and services resulting from IPv6. The aim of this project, in the scope of Future Internet, is to develop and to test a proposal of a new architecture based on the resources virtualization along with new mechanisms and algorithms concerning the crucial aspects of network operations. The goal of the project is to create a national test network environment for the IPv6 Internet and Future Internet, enabling research and development activities based on the experimental verification.

[Pro33] **IDESA – 2 „Implementation of widespread IC design skills in advanced deep submicron technologies at European Academia",** (IDESA-2 "Rozpowszechnienie umiejętności projektowania submikronowych układów scalonych w europejskich wyższych uczelniach"), EU structural project, project leader: Wiesław Kuźmicz, September 2010 – August 2012

The goal of this project is to train the staff of European universities in design of integrated circuits to be implemented in state-of-the-art deep submicron technologies. Based on examples of practical designs a series of intensive 5-day hands-on courses have been prepared and are given at numerous sites throughout Europe. IMiO WUT staff members were among those preparing the courses and are active as lecturers.

[Pro34] **Innovative technologies of multi-functional materials and structures for nanoelectronics, photonics, spintronics and sensors InTechFun,** (Innowacyjne technologie wielofunkcyjnych materiałów i struktur dla nanoelektroniki, fotoniki, spintroniki i technik sensorowych InTechFun), EU structural project, project leaders: Jan Szmidt, Wojciech Gwarek (The Institute of Radioelectronics WUT), project coordinator: Institute of Electron Technology, polish partners: Institute of Electron Technology, Institute of Physics Polish Academy of Science, Silesian University of Technology, Technical University of Lodz, Military University of Technology, 2009 – 2013

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

Expected results

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

[Pro35] **Micro and nano-systems in chemistry and biomedical diagnostic - Task 2A: Capillary microfluidic sensors use in fertility diagnostics** (Mikro i nanosystemy w chemii i diagnostyce biomedycznej MNS-DIAG), EU structural project**,** project leader: Jan Szmidt, co-worker: Michał Borecki, February 2009 – September 2012

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

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

[Pro36] **Nanocoated Optical Fiber Sensors for Biodiagnostics of Liquids,** EU structural project, project leader: Mateusz Śmietana, November 2011- October 2013

The project is carried out within the Action 1.2: „Strengthening the human resources potential of science" of the Innovative Economy Operational Programme by increasing dynamic development of scientific careers of members of the research teams as well as supporting their already established international scientific collaboration. The task realized by the team within this project is working out a technology for fabrication of long-period gratings coated with films of nanometric thickness. The work done within the task will include detail characterization of the developed structures as sensors for detection of variations in optical properties of liquids. There is foreseen capability for long-term monitoring of the optical properties of liquids containing substances of biological origins or monitoring of the presence of e.g. selected microorganisms, on the surface of the sensors. The sensing structures will be fabricated and modeled in collaboration with Université du Québec en Outaouais (Canada) and Indian Institute of Technology (Indie), respectively. The thin dielectric films will be deposited on the surface of the sensors using mainly plasma methods, which have been intensively developed in laboratories of Warsaw University of Technology and Technical University of Lodz.

[Pro37] **PARADIGM Photonic advanced research and development for integrated generic manufacturing** (Zaawansowane badania nad rozwojem generycznych technologii fotonicznych układów scalonych), EU structural project, project leader: Paweł Szczepański, co-worker: Katarzyna Ławniczuk, September 2011 – September 2014

The aim of the PARADIGM project is to create a paradigm shift in the development and manufacturing of photonic integrated components and circuits based on Indium Phosphide. This shift will result in the cost and time reduction of design, development, manufacturing and packaging based on generic foundry concept. The generic concept, as it is in micro-electronics and CMOS technology, enables realization of multi-functional circuits using only a set of standard building blocks. By introducing the generic concept to photonics field, realization of application specific photonic integrated circuits (APSICs) would be possible within standardized technological processes, and as a result functionally advanced photonic circuits would be introduced to our daily usage, daily life.

Institute of Microelectronics and Optoelectronics, Warsaw University of Technology, as its aim within the project, proposed establishing an Eastern Europe Design Hub (EEDH). EEDH will offer the state-of-the-art expertise in design, development and characterization of ASPICs to companies and research institution form Eastern part of Europe. By having an access to the advanced photonic technologies, establishing a laboratory of photonic component's and circuit's characterization, providing access to the most up-to-date software and simulators, EEDH will become a strategic partner in photonics in Eastern Europe part. Additionally EEDH creates an awareness of generic concept and ASPICs within Eastern Europe mainly by disseminating the knowledge of the potential of integrated photonics, its applications and generic fabrication model.

More information about the PARADIGM project is available on the website: www.paradigm.jeppix.eu.

[Pro38] **Technology of new generation of hydrogen and hydrogen compounds sensor for over normative conditions applications POIG "DETEH,"** (Opracowanie technologii nowej generacji czujnika wodoru i jego związków do zastosowań w warunkach ponadnormatywnych), EU structural project, project leader: Jan Szmidt, co-workers: J.Kalenik, P.Firek, A.Werbowy, M.Śmietana, July 2009 – June 2014

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

4.6. Other Projects

[Pro39] **Upgrade of vocational skills in field of application of ecological and effective energy solutions in Poland. Photovoltaic systems**, (Wspieranie kwalifikacji zawodowych w zakresie stosowania ekologicznych i efektywnych rozwiązań elektro-energetycznych w Polsce. Systemy fotowoltaiczne), National Fund for Environmental Protection and Water Management, Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Maciej Juźwik, co-workers: Piotr Knyps, Bartosz Fetliński, Ewa Piórecka, Jakub Wiśniewski, December 2010 –September 2012

Goal of the project is to improve vocational skills of people working in renewable energy and related sectors and increase awareness of progress in photovoltaic technologies among general public. To achieve this goal number (about 53) training seminars will be organized within given timeframe and in locations through Poland (there will be at least one training seminar in each voivodeship). Syllabus of each training seminar includes basics of photovoltaics effects, manufacturing technology of PV cells and modules, performance of different technologies in natural working conditions, practical guidelines for installers of grid-connected and autonomous systems as well as existing financial support mechanisms available for prospective investors in Poland. We estimate number of participants to reach 1600 at the end of project.

5. DEGREES AWARDED

5.1. D.Sc. Degrees

[DSc1] Michał Borecki, **Multiparametric fiber optic intensity sensors construction and modeling** (Modelowanie i konstrukcja wieloparametrycznych czujników światłowodowych), 14 June 2011

[DSc2] Witold Pleskacz, **Topography analysis of vlsi integrated circuits for manufacturability** (Analiza topografii układów scalonych VLSI pod kątem ich produkowalności), 18 January 2011

5.2. Ph.D. Degrees

[PhD1] Marcin Iwanowicz, **Impulse method characterization of modern MIS structures** (Charakteryzacja współczesnych struktur MIS metodami impulsowymi), supervisor: Lidia Łukasiak, 14 June 2011

[PhD2] Marcin Koba, **The model of radiation generation in photonic crystal laser** (Model generacji promieniowania w laserach posiadających ośrodek aktywny w postaci kryształu fotonicznego), supervisor: Paweł Szczepański, 22 June 2011

[PhD3] Kamila Leśniewska-Matys, **Modelling of light generation in phased array membrane planar waveguide lasers based on two dimensional photonic crystals** (Modelowanie generacji promieniowania w planarnym wielokanałowym laserze sprzężonym fazowo zbudowanym na bazie dwuwymiarowego kryształu fotonicznego), supervisor: Paweł Szczepański, 21 June 2011

[PhD4] Andrzej Mazurak, **Current-voltage characteristics modelling of double barrier MOS structures** (Modelowanie charakterystyk prądowo-napięciowych struktur metal-izolator-półprzewodnik z podwójną barierą potencjału), supervisor: Bogdan Majkusiak, 6 December 2011

5.3. M.Sc. Degrees

[MSc1] Tomasz Andrzej Adamowicz, **3D video in interactive user interfaces** (Wideo 3D w interaktywnych interfejsach użytkownika), advisor: Piotr Garbat, very good

[MSc2] Aleksander Paweł Bednarz, **The compensation impact of process variations of analog circuits' parameters in nanometer technologies - variable gain amplifier** (Kompensacja wpływu rozrzutów produkcyjnych na parametry bloków analogowych realizowanych w technologiach nanometrowych - wzmacniacz napięciowy o regulowanym wzmocnieniu), advisor: Zbigniew Jaworski, very good

[MSc3] Gaweł Krzysztof Gajdzis, **SRAM and ROM memory generation. Memory bank structure optimization** (Generacja pamięci SRAM/ROM. Optymalizacja struktury banków pamięci), advisor: Zbigniew Jaworski, very good

[MSc4] Witold Marian Kardyś, **Digitally controlled resonant inverter for ultrasonic welding technology** (Falownik rezonansowy z cyfrową syntezą sygnałów sterujących dla technologii zgrzewania ultradźwiękowego), advisor: Zbigniew Pióro, excellent

[MSc5] Jakub Marcin Kopański, **Integrated equalizer for high-speed data transmission in CMOS 65 nm technology** (Scalony wzmacniacz korekcyjny dla szybkich interfejsów komunikacyjnych w technologii CMOS 65 nm), advisor: Witold Pleskacz, very good

[MSc6] Konrad Korzybski, **A concept of the measurements procedures of key parameters of CCTV systems** (Opracowanie koncepcji pomiarów kluczowych parametrów systemu monitoringu wizyjnego), advisor: Piotr Garbat, good

[MSc7] Maciej Marian Krzyczkowski, **Automated generation of integrated circuit's layout based on its electrical scheme** (Automatyczna generacja topografii cyfrowego układu scalonego na podstawie schematu elektrycznego), advisor: Adam Wojtasik, very good

[MSc8] Łukasz Rafał Kuc, **Efficiency analysis of the artificial neural networks depending on the choice of the learning algorithm** (Analiza efektywności sztucznych sieci neuronowych w zależności od doboru algorytmu uczenia), advisor: Mikołaj Baszun, very good

[MSc9] Paweł Kurek, **Methods of digital systems designing using transaction-level model in SystemC** (Metody projektowania systemów cyfrowych z wykorzystaniem modelu na poziomie transakcji w języku SystemC), advisor: Elżbieta Piwowarska, very good

[MSc10] Łukasz Stanisław Leszczyński, **Design of functional blocks for SMOVE processor for compute modified discrete cosine transform MDCT/IMDCT** (Projekt bloków funkcjonalnych dla procesora SMOVE do wyznaczania dyskretnej zmodyfikowanej transformaty cosinusowej MDCT/IMDCT), advisor: Witold Pleskacz, very good

[MSc11] Michał Łukaszewicz, **A Current Reference Source for CMOS 65 nm Technology without Any External Components** (Scalone źródło prądu odniesienia bez elementów dyskretnych w technologii CMOS 65 nm), advisor: Witold Pleskacz, very good

[MSc12] Maciej Miszczak, **Miniature anemometer** (Miniaturowy anemometr), advisor: Zbigniew Pióro, very good

[MSc13] Piotr Narożnik, **Compensation transistor mismatch on analog circuit in Nanometer CMOS Technologies - Sample and Hold device** (Kompensacja wpływu rozrzutów produkcyjnych na parametry bloków analogowych realizowanych w technologiach nanometrowych - układ próbkująco-pamiętający), advisor: Zbigniew Jaworski, very good

[MSc14] Magdalena Pleban, **Qualification of factors which determine visual comfort for 3D images- crosstalk** (Określenie czynników warunkujących komfort widzenia 3D w systemach stereowizyjnych- przesłuch obrazów), advisor: Piotr Garbat, good

[MSc15] Dariusz Raćkowski, **Generation of memory SRAM/ROM. Synthesis of memory topography** (Generacja pamięci SRAM/ROM. Synteza topografii pamięci), advisor: Zbigniew Jaworski, very good

[MSc16] Beata Ruszkarska, **Safety and reliability of wireless and fiber networks in signal transmission - analysis and comparison** (Bezpieczeństwo i niezawodność transmisji sygnałów w sieciach radiowych i światłowodowych - analiza i porównanie), advisor: Agnieszka Szymańska, very good

[MSc17] Paweł Daniel Szewczyk, **The learning system by the Least Squares Support Vector Machine method and its application in medicine** (System uczący się metodą średniokwadratowej maszyny wektorów nośnych i jego zastosowanie w medycynie), advisor: Mikołaj Baszun, very good

[MSc18] Katarzyna Świątek, **Long-haul telecommunication systems** (Systemy telekomunikacyjne dalekiego zasięgu), advisor: Agnieszka Szymańska, good

[MSc19] Andrzej Taube, **Fabrication and characterization of thin hafnium oxide films for application in silicon carbide MOSFET technology** (Wytwarzanie i charakteryzacja cienkich warstw tlenku hafnu dla zastosowań w technologii MOSFET w węgliku krzemu), advisor: Jan Szmidt, excellent

[MSc20] Damian Wójcicki, **Emission properties of praseodymium activated (Sr,Mn)TiO3-TiO2 two-phase eutectics** (Właściwości emisyjne dwufazowych eutektyków (Sr,Mn)TiO3-TiO2 aktywowanych jonami prazeodymu), advisor: Marcin Piotr Kaczkan, very good

5.4. B.Sc. Degrees

[BSc1] Frederic Yannick Akoa Oyono, **Fabrication of optical fiber sensors with thin coating deposited using plasma technique** (Wytwarzanie czujników światłowodowych z pokryciami wykonywanymi w technice plazmowej), advisor: Mateusz Jakub Śmietana, good

[BSc2] Tomasz Białas, **HTML test generation system** (System generujący testy HTML), advisor: Bogdan Galwas, good

[BSc3] Mateusz Mikołaj Bugaj, **Implementation of fuzzy switching function disjunctive decomposition algorithm** (Implementacja algorytmu rozłącznej dekompozycji szeregowej funkcji rozmytych), advisor: Andrzej Wielgus, good

[BSc4] Mateusz Choromański, **The analysis of solutions used for tuning and measuring microwave acexcellenterating structures of medical linear acexcellenterators** (Analiza rozwiązań stosowanych do strojenia i pomiarów mikrofalowych struktur przyspieszających liniowych akexcellenteratorów stosowanych w medycynie), advisor: Ryszard Kisiel, good

[BSc5] Karol Dobkowski, **ARM9 microprocesor software in GSM/GPRS network and in Ethernet with use of Linux system** (Oprogramowanie mikroprocesora ARM9 w sieci GSM/GPRS oraz Ethernet z wykorzystaniem systemu Linux), advisor: Witold Pleskacz, very good

[BSc6] Jakub Grochowski, **Fabrication and characterization of semiconducting nickel oxide (NiO) films deposited by reactive magnetron sputtering technique** (Wytwarzanie warstw półprzewodnikowych tlenku niklu metodą magnetronowego rozpylania katodowego i ich charakteryzacja), advisor: Ryszard Kisiel, very good

[BSc7] Grzegorz Jabłoński, **Manufacturing thick film structures based on photosensitive inks** (Wytwarzanie struktur grubowarstwowych z past światłoczułych), advisor: Jerzy Kalenik, good

[BSc8] Piotr Kazimierz Karwacki, **Developement and implementation of a simple MOS transistor model for optimization of analog-circuits** (Opracowanie i implementacja uproszczonego modelu tranzystora MOS do optymalizacji układów analogowych), advisor: Dominik Krzysztof Kasprowicz, good

[BS] Paweł Krystian Kluz, **Test and calibration of the grating optical monochromator** (Test i kalibracja siatkowego monochromatora optycznego), advisor: Marcin Piotr Kaczkan, good

[BSc10] Cezary Kołaciński, **State of health monitoring system - analog part** (Układ do monitorowania stanu zdrowia pacjenta - część analogowa), advisor: Elżbieta Piwowarska, excellent

[BSc11] Krzysztof Krogulski, **Modeling I-V characteristics of a MOS transistor with linear distribution of germanium content along the channel** (Modelowanie charakterystyk prądowo-napięciowych tranzystora MOS z liniowym rozkładem zawartości germanu wzdłuż kanału), advisor: Lidia Łukasiak, very good

[BSc12] Jacek Henryk Leśniak, **Varactor tunable band-pass filter** (Filtr pasmowoprzepustowy przestrajany waraktorem), advisor: Bogdan Galwas, good

[BSc13] Michał Machczyński, **Smart sensor networks in vehicles** (Sieci inteligentnych czujników w pojazdach samochodowych), advisor: Zbigniew Pióro, good

[BSc14] Piotr Czesław Mąkosa, **Design and implementation of visualization environment for REBUS' input and output data in high-level programming language for reactor Maria at Institute of Energy Atomic POLATOM** (Opracowanie i implementacja w języku wysokiego poziomu środowiska do wizualizacji danych wejściowych i wyjściowych programu obliczeń neutronowo-fizycznych REBUS dla reaktora Maria w Instytucie Energii Atomowej POLATOM), advisor: Arkadiusz Władysław Łuczyk, good

[BSc15] Piotr Tadeusz Michniewski, **Brushless motor controller** (Sterownik silników bezszczotkowych), advisor: Zbigniew Pióro, good

[BSc16] Marcin Michał Myśliwiec, **Fabrication and characterization of TiAl ohmic contacts on p-type SiC** (Wytwarzanie i charakteryzacja kontaktów omowych ze stopu TiAl do p-SiC), advisor: Ryszard Kisiel, very good

[BSc17] Bartosz Tomasz Oliwa, **Analysis of parameters of photovoltaic grid-connected systems, installed on the Faculty of Environmental Engineering of Warsaw University of Technology** (Analiza pracy systemów fotowoltaicznych, dołączonych do sieci, zainstalowanych na Gmachu Inzynierii Środowiska Politechniki Warszawskiej), advisor: Stanisław Pietruszko, good

[BSc18] Błażej Aleksander Owczarek, **Test bench for measuring parameters of optical fibers** (Stanowisko pomiarowe do pomiarów parametrów światłowodów włóknowych), advisor: Ryszard Piramidowicz, very good

[BSc19] Dariusz Rafał Seweryn, **Remote respiration monitoring system** (System zdalnego monitorowania oddechu), advisor: Mikołaj Baszun, good

[BSc20] Karol Sokolik, **Gas detection robot. Moving and detection algorithm** (Robot do detekcji gazów. Poruszanie się i algorytm detekcji), advisor: Zbigniew Pióro, very good

[BSc21] Andrzej Szymon Steciuk, **The analysis of image sequences for CCTV use - activity detection,** (Analiza sekwencji obrazów dla potrzeb systemów CCTV - detekcja aktywności), advisor: Piotr Garbat, good

[BSc22] Łukasz Daniel Sudoł, **C band erbium doped fiber amplifier** (Wzmacniacz światłowodowy EDFA na pasmo C), advisor: Ryszard Piramidowicz, good

[BSc23] Arkadiusz Szydlik, **Fiber sensor system powered remotely with optical power** (Światłowodowy system czujnikowy zdalnie zasilany mocą optyczną), advisor: Ryszard Piramidowicz, good

[BSc24] Michał Śpiczko, **Study of fiber optics dispersion parameters** (Badanie parametrów dyspersyjnych światłowodów włóknowych), advisor: Ryszard Piramidowicz, good

[BSc25] Mateusz Teodorowski, **Implementation of PGA (Programmable Gain Amplifier) for 13,56 MHz radio receiver in CMOS 90 nm technology** (Implementacja układu PGA (Programmable Gain Amplifier) dla ogoodiornika radiowego 13,56 MHz w technologii CMOS 90 nm), advisor: Witold Pleskacz, very good

[BSc26] Andrzej Jerzy Wojeński, **Module for driving serial data port through Ethernet** (Moduł sterowania portu szeregowego przez Ethernet), advisor: Zbigniew Pióro, very good

[BSc27] Michał Eligiusz Wołodźko, **Low current and low drop output linear voltage regulator implementation in CMOS 350 nm technology** (Implementacja liniowego regulatora napięcia LDO o bardzo małym poborze prądu w technologii CMOS 350 nm), advisor: Arkadiusz Władysław Łuczyk, very good

[BSc28] Michał Grzegorz Zbieć, **Health state monitoring system - digital part** (Układ do monitorowania stanu zdrowia pacjenta - część cyfrowa), advisor: Elżbieta Piwowarska, very good

[BSc29] Łukasz Daniel Zimkiewicz, **Coding of odor information in multimedia applications** (Kodowanie informacji zapachowych w aplikacjach multimedialnych), advisor: Mikołaj Baszun, good

6. PUBLICATIONS

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

Number	Journal	Authors	Title	Volume	Pages
[Pub1]	Acta Physica Polonica A	J.D.Fidelus, A.Karbowski, J.Grabis, A.Jusza, R.Piramidowicz, R.S.Brusa, G.P.Karwasz	Positron-annihilation, structural and optical studies on properties of nanostructured ZrO_2, ZnO, Bi_2O_3 and ZnO-Bi_2O_3	Vol. 120 No 6-A	66 – 68
[Pub2]	Acta Physica Polonica A	W.Paszkowicz, J.B.Pełka, J.Krupka, A.Abramowicz	Old studies with new authors: a discovery ending with retraction	Vol. 119, No 6	901 - 903
[Pub3]	Apllied Physics Letters	J.Krupka, T.Shimada, I.Ueda, W.Karcz	Electromagnetic properties of sapphire, ruby and irradiated ruby at frequencies of 30-40 GHz	99	102901-1 – 102901-3
[Pub4]	Appl Phys B	R.Piramidowicz, R.Mahiou, P.Boutinaud, M.Malinowski	Upconversion excitations in Pr3+-doped BaY2F8 crystal	104	873-881
[Pub5]	Applied Physics B	R.Piramidowicz, R.Mahiou, P. Boutinaud, M.Malinowski	Upconversion excitations in Pr^{3+}-doped BaY_2F_8 crystal	104	873 - 881
[Pub6]	Applied Physics Letters	J.Krupka, J.G.Hartnett, M.Piersa	Permittivity and microwave absorption of semi-insulating InP at microwave frequencies	98	112112
[Pub7]	IEEE Journal of Quattum Electronics	M.Koba, P.Szczepański, T.Kossek	Nonlinear operation of a 2-D triangular lattice photonic crystal laser	Vol. 47, No 1	13 - 19
[Pub8]	Journal of Applied Physics	J.G.Hartnett, D.Mouneyrac, J.Krupka, J.M.Le Floch, M.E.Tobar, D.Cros	Microwave properties of semi-insulating silicon carbide between 10 and 40 GHz and at cryogenic temperatures	109	064107-1 - 064107-4
[Pub9]	Journal of Applied Physics	J.M.Le Floch, R.Bara, J.G.Hartnett, M.E.Tobar, D.Mouneyrac, D.Passerieux, D.Cros, J.Krupka, P.Goy, S.Caroopen	Electromagnetic properties of polycrystalline diamond from 35 K to room temperature and microwave to terahertz fraquencies	109	094103-1 - 094103-6
[Pub10]	Journal of Modern Optics	M.Koba, P.Szczepański, T.Osuch	Nonlinear analysis of a photonic crystal laser	Vol. 58, No 17	1538 - 1550
[Pub11]	Journal of Nanoscience and Nanotechnology	J.Krupka, W.Strupiński, N.Kwietniewski	Microwave conductivity of very thin graphene and metal films	Vol. 11, No 4	3358 - 3362
[Pub12]	Journal of Rare Earths	M.Dudek, A.Jusza, K.Anders, L.Lipińska, M.Baran, RPiramidowicz	Luminescent properties of praseodymium doped Y_2O_3 and $LaAlO_3$ nanocrystallites and polymer composites	Vol. 29 No 12	1123– 1129
[Pub13]	Journal of Vacuum Science and Technology B	A.Mazurak, J.Walczak, B.Majkusiak	Modeling of tunneling through a three-layer gate stack with/without a quantum well	Vol. 29 No 2	020605-1 – 020605-9
[Pub14]	Liquid Crystals	J.Parka, R.Kowerdziej, M.Romaniuk	Photorefractive properties of new liquid crystals in the near-infrared range	38, No 1	25 - 30
[Pub15]	Liquid Crystals	R.Kowerdziej, J.Parka, J.Krupka,	Experimental study of thermally controlled metamaterial containing a liquid crystal layer at microwave frequencies	Vol. 38, No 6	743 - 747
[Pub16]	Liquid Crystals	R.Kowerdziej, J.Parka, P.Nyga, B.Salski	Simulation of a tunable metameterial with nematic liquid crystal layers	Vol. 38 No 3	377 - 379
[Pub17]	Material Science and Engineering B	M.Sochacki, P.Firek, N.Kwietniewski, J.Szmidt, W.Rzodkiewicz	Electronic properties of $BaTiO_3$/4H-SiC interface	176	301 - 304
[Pub18]	Measurement Science and Technology	M.Śmietana, W.J.Bock, P.Mikulic, J.Chen	Inreasing sensitivity of arc-induced long-period gratings – pushing the fabrications technique toward its limits	22	015201-1 - 0152016
[Pub19]	Measurements Science and Technology	J.Krupka, D.Nguyen, J.Mazierska	Microwave and RF methods of contact less mapping of the sheet resistance and the complex permitivitty of conductive materials and semiconductors	22	085703 – 6pp

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[Pub20]	Measurements Science and Technology	M.Śmietana, W.J.Bock, P.Mikulic	Temperature sensitivity of silicon nitride nanocoated long-period gratings working in various surrounding media	22	115203-1 – 115203-7
[Pub21]	Microelectronics Reliability	B.Majkusiak, R.B.Beck, A.Mazurak, J.Grabowski	Investigation of double barrier MOS tunnel diodes with PECVD silicon quantum well	51	1172 - 1177
[Pub22]	Microelectronics Reliability	M.Inwanowicz, J.Jasiński, G.Głuszko, L.Łukasiak, A.Jakubowski, H.Gottlob, M.Schmidt	Studies of the quality of GdSiO-Si interface	51	1178 - 1182
[Pub23]	Microelectronics Reliability	M.Jakubowska, M.Jarosz, K.Kiełbasiński, A.Młożniak	New Conductive thic-film paste based on silver nanopowder for high power and high temperature applications	Vol. 51	1235 - 1240
[Pub24]	Microelectronics Reliability	P.Firek, J.Szmidt	MISFET structures with barium titanate as a dielectric layer for application in memory cells	51	1187- 1191
[Pub25]	Microelectronics Reliability	R. Mroczyński, M. Kalisz, R.B. Beck	Improvement of immunity on MeV electron radiation of MOS structures by means of ultra-shallow fluorine implantation	Vol. 51, No 7	1183- 1186
[Pub26]	Microelectronics Reliability	R.Mroczyński, R.B.Beck	Reliability issues of double gate dielectric stacks based of hafnium dioxide (HfO_2) for applications in non-volatile semiconductor memory (NVSM) devices	52	107-111
[Pub27]	Molecular Crystals and Liquid Crystals	R.Kowrdziej, J.Parka, P.Nyga	Tunable liquid crystalline metamaterial structure in GHz range	545	91 - 95
[Pub28]	Nano letters	W.Strupiński, K.Grodecki, A.Wysmolek, R.Stępniewski, T.Skopek, P.E.Gaskell, A.Gruneis, D.Haberer, R.Bozek, J.Krupka, J.M.Baranowski	Graphene epitazy by chemical vapor deposition on SiC	11	1786- 1791
[Pub29]	Optica Applicata	M.Mroczyński, M.Cież. J.Kalenik	Studies of rejuvenation of electroluminescent thick film structures	Vol. XLI No 2	481 - 486
[Pub30]	Optical Materials	A.Jusza, K.Anders, A.Jastrzębska, P.Polis, A.Olszyna, M.Kuś, A.Kunicki, R.Piramidowicz	Luminescent and structural properties of Yb^{3+}-doped Al_2O_3 nanopowders	33	1487– 1491
[Pub31]	Optical Materials	M.Kaczkan, D.A.Pawlak, S.Turczynski, M.Malinowski	Emission properties of (SrTiO3–TiO2):Pr3+ eutectic with self-organized fractal microstructure	33	1519– 1524
[Pub32]	Optical Materials	M.Malinowski, M.Kaczkan, S.Turczynski, D.Pawlak	Concentration effects on Pr3+ luminescence in LaAlO3 crystals”	33	1004– 1007
[Pub33]	Optical Materials	S.Mahlik, M.Malinowski, M.Grinberg	High pressure and time resolved luminescence spectra of Gd3Ga5O12:Pr3+ crystal	33	1525– 1529
[Pub34]	Optical Materials	S.Mahlik, M.Malinowski, M.Grinberg	High pressure luminescence and time resolved spectra of La2Be2O5:Pr3+	34	164–168
[Pub35]	Optics and Lasers in Engineering	M.Sutkowski, W.Piecek, T.Grudniewski, J.Parka, E.Nowinowski-Kuszelnicki	Light driven optical switching of the surface stabilized antiferroelectric liquid crystals	No 49	1330 - 1334
[Pub36]	Optics Communications	W.J.Bock, T.Eftimov, M.Śmietana, P.Mikulic	Efficient distributed moisture-ingress sensing using diamond-like carbon-nanocoated long-period gratings	284	4470 - 4472
[Pub37]	Optics Express	M.Śmietana, W.J.Bock, P.Mikulic, A.Ng, R.Chinnappan, M.Zourob	Detection of bacteria using bacteriophages as recognition elements immobilized on long-period fiber gratings	Vol. 19, No 9	7971 - 7978
[Pub38]	Polimery	P.Łoś, A.Łukomska, S.Kowalska, R.Jieziórska, J.Krupka	Obtaining and properties of polyolefincomposites meta materials with copper micro and nanoflakes	Vol. LVI, No 4	324 - 327
[Pub39]	Solid State Phenomena	Ł. Gelczuk, M. Dąbrowska-Szata, M. Sochacki, J. Szmidt	Deep level defects in 4H-SiC Schottky diodes examined by DLTS	178-179	366 - 371

[Pub40]	Thin Solid Films	M.Śmietana, W.J.Bock, J.Szmidt	Evolution of optical properties with deposition time of silicon nitride and diamond-like carbon films deposited by radio-frequency plasma-enhanced chemical vapor deposition method	519	6339 - 6343

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

Number	Journal	Authors	Title	Volume	Pages
[Pub41]	Advanced Materials Research	B.Majkusiak, A.Mazurak	Some issuesof modeling the double barrier metal-oxide-semiconductor tunnel structures	Vol. 276	77 - 85
[Pub42]	Advanced Materials Research	M.Zaborowski, D.Tomaszewski, L.Łukasiak, A.Jakubowski	Non-standard FinFET devices for small volume sample sensors	Vol. 276	127 - 135
[Pub43]	Elektronika	A.Mazurak, J.Walczak, B.Majkusiak	Modelowanie struktur MOS z podwójną barierą potencjału	2	40 - 43
[Pub44]	Elektronika	A.Mazurak, B.Majkusiak	Modeling the charge trapping effect in high-K gate stacks on the tunnel current	Vol. LII No 3	33 - 35
[Pub45]	Elektronika	A.Sawicka, B.Majkusiak, T.Numata, S.Uno, G.Milnikov, N.Mori	Modeling the ballistic and tunnel source-drain currents in silicon nanowire MOSFETs	Vol. LII, No 3	36 - 38
[Pub46]	Elektronika	A.Sawicka, L.Łukasiak, A.Jakubowski, D.Tomaszewski	Model prądu drenu i pojemności w dwubramkowym tranzystorze MOS o krótkim kanale	2	80 - 84
[Pub47]	Elektronika	A.Taube, K.Korwine-Mikke, T.Gutt, T.Małachowski, I.Pasternak, M.Worek, A.Łaszcz, M.Płuska, W.Rzodkiewicz, A.Piotrowska, S.Gierałtowska, M.Sochacki, R.Mroczyński, E.Dynowska, J.Szmidt	Wytwarzanie i charakteryzacja cienkich warstw tlenku hafnu dla zastosowań w technologii MOSFET w węgliku krzemu	9	117 - 120
[Pub48]	Elektronika	A.Taube, M.Sochacki, J.Szmidt	Konstrukcja i modelowanie tranzystorów wertykalnych DIMOSFET w węgliku krzemu	Vol. LII, No 9	45 - 49
[Pub49]	Elektronika	A.Wojtasik	Przetwarzanie równoległe w algorytmach CAD stosowanych do projektowania i optymalizacji układów scalonych	2	34 - 40
[Pub50]	Elektronika	B.Majkusiak	Charakcterization of MOS structures with ultrathin insulator layer by means of a theoretical model	Vol. LII, No 3	30 - 32
[Pub51]	Elektronika	E.Kowalska, E.Czerwosz, M.Kozłowski, P.Firek, J.Rymarczyk, J.Radomska	Influence of substrate type on structure of C-Pd thin films	No 7	
[Pub52]	Elektronika	J.Krupka, W.Strupiński, A.Stefański, M.Baszun, Z.Mączeński	Pomiary elektromagnetycznych właściwości metamateriałów planarnych i grafenu w paśmie częstotliwości mikrofalowych	2	65 - 69
[Pub53]	Elektronika	K.Anders, P.Florczyk, P.Gdula, A.Jusza, R.Piramidowicz	Erbowe lasery włóknowe w geometrii „all-fiber”	2	95 - 99
[Pub54]	Elektronika	K.Król, M.Kalisz, M.Sochacki, J.Szmidt	Wpływ wygrzewania na jakość warstw SiO_2 wytwarzanych na podłożach 4H-SiC metodą utleniania termicznego	Vol. 52, No 7	93 - 95
[Pub55]	Elektronika	K.Ławniczuk, R.Piramidowicz, P.Szczepański, M.K.Smit, X.J.M.Leijtens	Fotoniczne układy scalone	2	74 - 80

[Pub56]	Elektronika	K.Welikow, P.Gdula, R.Piramidowicz	Modelowanie dyspersji chromatycznej w światłowodach mikrostrukturalnych metodą efektywnego współczynnika załamania	2	88 - 95
[Pub57]	Elektronika	M.Borecki, M.Bebłowska, J.Szmidt, A.Kociubiński, M.L.Korwin-Pawłowski	Zagadnienia klasyfikacji biopaliw – głowica hybrydowa współpracująca z optrodami kapilarnymi	No 9	56 - 59
[Pub58]	Elektronika	M.Jusza, R.Piramidowicz	Implementacja zdalnego zasilania elementów aktywnych światłowodowych sieci czujnikowych promieniowaniem laserowym	2	69 - 73
[Pub59]	Elektronika	M.Kalisz, K.Król, M.Sochacki, J.Szmidt	Wpływ procesu wygrzewania wysokotemperaturowego na parametry elektryczne struktury MOS Al/SiO_2/n-4H-SiC (0001)	Vol. LII, No 9	121 - 124
[Pub60]	Elektronika	M.Kalisz, R.Mroczyński, R.B.Beck	Ultra-płytka implantacja fluoru z plazmy w.cz. jako metoda poprawy właściwości elektro-fizycznych struktur MIS z dielktrykami bramkowymi wytwarzanymi metodą PECVD	2	20 - 26
[Pub61]	Elektronika	M.Koba, P.Szczepański	Nieliniowy model pracy lasera z ośrodkiem aktywnym w postaci dwuwymiarowego kryształu fotonicznego	2	47 - 55
[Pub62]	Elektronika	M.Koba, P.Szczepański	Progowy model pracy lasera z ośrodkiem aktywnym w postaci 2D kryształu fotonicznego	2	56 - 64
[Pub63]	Elektronika	M.Łuszczyk, J.Dawidczyk	Właściwości sygnałów radarowych z modulacją częstotliwości	Vol. 52, No 5	135 - 141
[Pub64]	Elektronika	P.Firek, A.Taube, J.Szmidt	Influence of annealing on propertie of barium titanate thin films	2	31 - 33
[Pub65]	Elektronika	P.Garbat	Przetwazranie obrazu wspomagane analizą parametrów polaryzacji światła w systemach monitoringu wizyjnego	2	43 - 46
[Pub66]	Elektronika	P.Gdula, K.Welikow, P.Szczepański, R.Buczyński, R.Piramidowicz	Modelowanie parametrów propagacyjnych polimerowych światłowodów mikrostrukturalnych do zastosowań w sieciach FTTH	2	11 - 17
[Pub67]	Elektronika	P.Sałek, L.Łukasiak, A.Jakubowski	Modelowanie napięcia progowego w niedomieszkowanych dwubramkowych strukturach MOS	2	18 - 20
[Pub68]	Elektronika	R.Mroczyński	Wytwarzanie i charakteryzacja cienkich warstw tlenku hafnu dla zastosowań w technologii MOSFET w węgliku krzemu	9	119 - 121
[Pub69]	Elektronika	S.Stopiński, M.K.Smit, X.J.M.Leijtens, M.Malinowski, R.Piramidowicz	Fotoniczne układy scalone w systemach odczytu danych z multipleksacją w dziedzinie czasu	2	84 - 87
[Pub70]	Elektronika	Z.Jaworski, P.Mierzwiński	12-bitowy przetwornik C/A w technologii CMOS 0,35μm	2	26 - 30
[Pub71]	Journal of Telecommunication and Information Technology	P.Szewczyk, M.Baszun	The learning system by the least squares support vector machine method and its application in medicine	3	109 - 113
[Pub72]	Journal of Telecommunications and Information Technology	P.Szewczyk, M.Baszun	The learning system by the least squares support vector machine method and its application in medicine	No 3	109 - 113
[Pub73]	Magazyn fotowoltaika	B.Fetliński, M.Juźwik, P.Knyps, M.Malinowski, J.Wiśniewski	Monitorowanie pracy systemów fotowoltaicznych oraz badania certyfikacyjne modułów fotowoltaicznych w Zakładzie Optoelektroniki IMiO PW.	2	4 - 6

[Pub74]	Materiały Elektroniczne	E.Dumiszewska, P.Knyps, M.Teodorczyk, M.Wesołowski, W.Strupiński	Optymazlizacja wytwarzania pierwszego złącza trójzłączowych ogniw słonecznych na bazie związków InGaP/InGaAs/Ge	Vol. 39, No 3	10 - 14
[Pub75]	Otolaryngologia Polska	A.Wałkanis, M.Czesak, W.A.Pleskacz	Elektrogustometr uniwersalny EG-2	Vol. 65, No 2	108 - 111
[Pub76]	Photonics Letters of Poland	A.Lazarowska, S.Mahlik, M.Grinberg, M.Malinowski	High pressure luminescence and time resolved spectra of LiNbO:Pr3+	Vol. 3 No 2	67-69
[Pub77]	Photonics Letters of Poland	A.Mossakowska-Wyszyńska, M.Kaczkan, M.Koba, D.A.Pawlak, K.Kołodziejak, S.Turczyński	Analysis of the microstructured eutectic Tb3Sc2Al3O12 – TbScO3 photonic crystal properties	Vol. 3 No 3	116 - 118
[Pub78]	Proc. of SPIE: 21st International Conference on Optical Fiber Sensors	M.Śmietana, W.J.Bock, P.Mikulic, J.Szmidt	Effective tuning of long-period grating refractice-index sensituvity by plasma-deposited diamond-like carbon nano-coatings	7753	77539F-1 – 77539F-4
[Pub79]	Proc. of SPIE: 21st International Conference on Optical Fiber Sensors	M.Śmietana, W.J.Bock, P.Mikulic, J.Chen, R.Wisniewski	Pressure sensitivity of dual resonant long-period gratings written in boron co-doped optical fiber	7753	77539E-1 – 77539E-4
[Pub80]	Proc. of SPIE: 21st International Conference on Optical Fiber Sensors	M.Śmietana, D.Brabant, W.J.Bock, P.Mikulic, T.Eftimov	Inline core-cladding intermodal interferometer based on nano-coated photonic crystal fiber for refractive-index sensing	7753	77531R-1 – 77531R-4
[Pub81]	Proc. of SPIE: Laser Physics and Applications	K.Zhelyazkova, T.Eftimov, M.Śmietana	A differential detection scheme of spectral shifts in long-period fiber gratings	7747	77470S-1 – 7740S-9
[Pub82]	Przegląd Elektrotechniczny	K.Marcinek	Design and Implementation of ZigBee Solution for Last-Mile Problem in Automatic Meter Reading	Vol. 87, No 12	15 - 20
[Pub83]	Przegląd Telekomunikacyjny - Wiadomości Telekomunikacyjne SIGMA NOT	R.Krenz, P.Szczepański, P.Gdula, K.Welikow, R.Piramidowicz, P.Zwierko, M.Natkaniec	Koncepcja systemów dostępowych do Internetu Przyszłości	Vol. LXXXIV No 8-9	832 - 839
[Pub84]	Życie Weterynaryjne	K.Urbańska, M.Szmidt, M.Borecki, P.Sysa	Zmienność parametrów wydzieliny dróg rodnych w przebiegu cyklu rujowego bydła ze szczególnym uwzględnieniem okresu płodnego	Vol. 86 No 2	127 - 129

6.3. Scientific and Technical Papers Published in Conference Proceedings

Number	Conference	Authors	Title	City, Country	Pages
[Pub85]	14th IEEE Symposium on Design and Diagnostics of Electronic Circuits and Systems, IEEE DDECS, April 13-15	J.Kopański, W.A.Pleskacz, D.Pieńkowski	A 5Gb/s equalizer for USB 3.0 receiver in 65 nm CMOS technology	Cottbus, Germany	1-4
[Pub86]	14th IEEE Symposium on Design and Diagnostics of Electronic Circuits and Systems, IEEE DDECS, April 13-15	K.Siwiec, T.Borejko, W.A.Pleskacz	CAD tool for PLL design	Cottbus, Germany	1-4
[Pub87]	14th IEEE Symposium on Design and Diagnostics of Electronic Circuits and Systems, IEEE DDECS, April 13-15	K.Siwiec, T.Borejko, W.A.Pleskacz	PVT tolerant LC-VCO in 90 nm CMOS technology for GPS/Galileo applications	Cottbus, Germany	1-6
[Pub88]	14th IEEE Symposium on Design and Diagnostics of Electronic Circuits and Systems, IEEE DDECS, April 13-15	M.Łukaszewicz, T.Borejko, W.A.Pleskacz	A resistorless current reference source for 65 nm CMOS technology with low sensitivity to process, suply voltage and temperature variations	Cottbus, Germany	1-5

[Pub89]	16th Annual Symposium of the IEEE Photonics Society Benelux, December 1-2	K.Ławniczuk, I.G.Knight, P.J.Wiliams, M.J.Wale, R.Piramidowicz, P.Sczepański, M.K.Smit, X.J.M.Leijtens	Multiwavelength photonic transmitters in a multi-project wafer run	Ghent, Belgium	173-176
[Pub90]	18th Int. Conference "Mixed Design of Integrated Circuits and Systems", MIXDES 2011, June 16-18	A.Pfitzner	Vertical-Slit Field-Effect Transistor (VeSFET) – design space exploration and DC model	Gliwice, Poland	151-156
[Pub91]	18th Int. Conference "Mixed Design of Integrated Circuits and Systems", MIXDES 2011, June 16-18	A.Pfitzner, M.Staniewski, M.Strzyga	Junction Verctical Slit Field-Effect Transistor (JVeSFET) – compact DC model	Gliwice, Poland	133-138
[Pub92]	18th Int. Conference "Mixed Design of Integrated Circuits and Systems", MIXDES 2011, June 16-18	D.Kasprowicz	A compact model of VeSFET capacitances	Gliwice, Poland	121-126
[Pub93]	18th Int. Conference "Mixed Design of Integrated Circuits and Systems", MIXDES 2011, June 16-18	W.Maly, A.Pfitzner, D.Kasprowicz, W.Kuźmicz, N.Sing, Z.Chen, at al	Twin gate, vertical slit FET (VeSFET) for highly periodic layout and 3D integration	Gliwice, Poland	145-150
[Pub94]	21st International Travelling Summer School on Microwaves and Lightwaves 2011, July 9-15	B.Galwas	RF photonic technology	Darmstadt, Germany	1-48
[Pub95]	21st International Travelling Summer School on Microwaves and Lightwaves 2011, July 9-15	K.Welikow, P.Szczepański, R.Piramidowicz	Modeling and optimization of bending losses in microstructured plastic optical fibers	Darmstadt, Germany	1-22
[Pub96]	21st International Travelling Summer School on Microwaves and Lightwaves 2011, July 9-15	P.Szczepański	Photonic crystals – applications in lasers	Darmstadt, Germany	1-62
[Pub97]	23rd Int. Conference on Indium phosphide and Related Materials IPRM 2011, May 22-26	K.Ławniczuk, R.Piramidowicz. P.Szczepański, P.J.Wiliams, M.J.Wale, M.K.Smit, X.J.M.Leijtens	8-channel AWG-based multiwavelength laser fabricated in a multi-project wafer run	Berlin, Germany	1-4
[Pub98]	34th International Spring Seminar on Electronics Technology ISSE'2011, May 11-15	M.Myśliwiec, M.Sochacki, R.Kisiel, M.Guziewicz, M.Wzorek	TiAl – Based ohmic contact on p-type SiC	High Tatras, Slovakia	68-72
[Pub99]	34th International Spring Seminar on Electronics Technology ISSE'2011, May 11-15	M.Myśliwiec, M.Sochacki, R.Kisiel, M.Guziewicz, M.Wzorek	TiAl-based ohmic contacts on p-type SiC	High Tatras, Slovakia	66-67
[Pub100]	34th International Spring Seminar on Electronics Technology ISSE'2011, May 11-15	R.Kisiel, Z.Szczepański, M.Sochacki, M.Chmielewski, M.Guziewicz, A.Strojny, T.Fałat, M.Jakubowska, E.Tymicki, M.Jarosz	Thermal properties of SiC – Ceramics substrate interface made by silver glass composition	High Tatras, Slovakia	98-102
[Pub101]	34th International Spring Seminar on Electronics Technology ISSE'2011, May 11-15	R.Kisiel, Z.Szczepański, M.Sochacki, M.Chmielewski, M.Guziewicz, A.Strojny, T.Fałat, M.Jakubowskia, E.Tymicki, M.Jarosz	Thermal properties of sic-ceramics substrate interface made by silver glass composition - abstract	High Tatras, Slovakia	56-57

[Pub102]	35th International Microelectronics and Packaging IMAPS-CPMT Poland Conference, September 21-24	M.Mroczkowski, M.Czyż, J.Kalenik	Invetigation of multiple degradation and rejuvenation cycles of electroluminescent thick film structures	Gdańsk-Sobieszewo, Poland	161-163
[Pub103]	35th International Microelectronics and Packaging IMAPS-CPMT Poland Conference, September 21-24	R.Kisiel, J.Szmidt, M.Sochacki, M.Guziewicz	Overview of SiC die assemlby technologies for high temperature electronics	Gdańsk-Sobieszewo, Poland	23-33
[Pub104]	35th International Microelectronics and Packaging IMAPS-CPMT Poland Conference, September 21-24	R.Kisiel, Z.Szczepański, P.Firek, M.Guziewicz, A.Krajewski	Mechanical and thermal properties of SiC – ceramics substrate interface	Gdańsk-Sobieszewo, Poland	241-245
[Pub105]	35th International Microelectronics and Packaging IMAPS-CPMT Poland Conference, September 21-24	Z.Szczepański, M.Borecki, D.Szmigiel, M.L.Korwin Pawłowski	Design and realization of a microfluidic capillary sensor based on a silicon structure and disposable optrodes	Gdańsk-Sobieszewo, Poland	191-195
[Pub106]	35th International Microelectronics and Packaging IMAPS-CPMT Poland Conference, September 21-24	Z.Szczepański, M.Borecki, M.Szmigiel, M.L.Korwin-Pawłowski	Design and realization of a microfluidic capillary sensor based on a sillicon structure and disposable optrodes	Gdańsk-Sobieszewo, Poland	191-194
[Pub107]	3rd Int. Symp. on Advanced Plasma Science and its Applications for Nitrides and Nanomaterials ISPlasma2011, March 6-9	A.Malinowski, M.Hori, M.Sekine, K.Ishikawa, H.Kondo, H.Yamamoto, T.Takeuchi, T.Suzuki, A.Jakubowski, L.Łukasiak	Radical flux modeling and analysis for sticking coefficient evaluation	Nagoya, Japan	P2-020A
[Pub108]	40th Winter School on Wave and Quantum Acoustics and 16th Winter Workshop on Photoacoustics and Thermal Wave Methods, February 27 – March 3	A.Kaźmierczak-Bałata, J.Bodzenta, J.Szmidt, P.Firek	Thermal properties and morphology of BaTiO3 thin films deposited on Si substrates	Szczyrk, Poland	13
[Pub109]	4th Int. Conf. on PLAsma-NanoTechnology & Science, IC-PLANTS 2011, March 10-12	A.Malinowski, M.Sekine, M.Hori, K.Ishikawa, H.Kondo, T.Suzuki, H.Yamamoto, T.Takeuchi, A.Jakubowski, L.Łukasiak	Investigation of surface reactions in ArF photoresist by using parallel plate structure in conjunction with numerical analysis	Gifu, Japan	P-37
[Pub110]	58th Spring Meeting of Japanese Society of Applied Physics, March 17-20	A.Malinowski, M.Hori, M.Sekine, K.Ishikawa, H.Kondo, H.Yamamoto, T.Takeuchi, T.Suzuki, L.Łukasiak, A.Jakubowski, D.Tomaszewski	Radical flux analysis in ArF photoresist plasma etching using parallel plate structure	Kanagawa, Japan	08-157
[Pub111]	9th International Conference Cyberspace, November 25-26	M.Baszun, B.Czejdo	A medical cyberspace: functionality and privacy aspects	Brno, Czech	1-7
[Pub112]	CLEO/Europe-EQEC 2011, Conference on Lasers and Electro-Optics Europe and 12th European Quantum Electronics Conference, May 22-26	K.Anders, A.Jusza, M.Malinowski, D.Pysz, R.Stępień, R.Piramidowicz	Red, green and violet up-conversion in erbium doped tellurite glasses	Munich, Germany	111

[Pub113]	CLEO/Europe-EQEC 2011, Conference on Lasers and Electro-Optics Europe and 12th European Quantum Electronics Conference, May 22-26	K.Kopczyński, J.Sarnecki, J.Młynarczyk, M.Malinowski, R.Piramidowicz, Z.Mierczyk, M.Maciejewska, M.Nakielska	Optical properties of GGG thin films doped with Ni2+ and Co2+ ions	Munich, Germany	122
[Pub114]	CLEO/Europe-EQEC 2011, Conference on Lasers and Electro-Optics Europe and 12th European Quantum Electronics Conference, May 22-26	R.Piramidowicz, A.Jusza, K.Anders, J.D.Fidelus, M.Godlewski, S.Yatsunenko	Fluorescence properties of Pr:YSZ doped polymer nanocomposites	Munich, Germany	122
[Pub115]	Conference Frontiers in Optics (FiO) 2011/Laser Science (LS) XXVII, October 16-20	K.Leśniewska-Matys, B.Salski, P.Szczepański	A Novel Phased Array Planar Laser Based on the Membrane 2D Photonic Crystals, LTuH5	San Jose, CA, USA	
[Pub116]	EUROMAT 2011 - European Congress and Exhibition on Advanced Materials and Processes, September 12-15	J.D.Fidelus, S.A.Yatsunenko, K.Anders, R.Piramidowicz	Optical properties of CNT/Pr:YSZ/PDMS Nanocomposites	Montpellier, France	
[Pub117]	Hybrid Materials 2011, Second International Conference on Multifunctional, Hybrid and Nanomaterials, March 6-10	RPiramidowicz, A.Jusza, K.Anders, M.Baran, L.Lipinska	Polymer nanocomposites doped with oxide nanopowders activated by Pr, Er and Tm ions	Strasbourg, France	
[Pub118]	Int. Conference on Information Photonics, ICO, May 18-20	K.Ławniczuk, P.J.Wiliams, N.D.Whitbread, M.J.Wale, R.Piramidowicz, P.Szczepański, M.K.Smit, X.J.M.Leijtens	AWG – based multiwavelenght lasers fabricated in a multi-project wafer run	Ottawa, Canada	1-2
[Pub119]	II Polska Konferencja Optyczna, June 27–July 1	K.Ławniczuk	Fotoniczne lasery wieloczęstotliwościowe wytworzone metodą Multi-project wafer run	Międzyzdroje, Poland	
[Pub120]	IX Conference on Vacuum Technology and Workshop on Field Emission from Carboaceous Materials, June 6-9	M.Mroczkowski, M.Kisieliński, J.Kalenik, K.Król	High voltage power supply for excitation of cold emission of electrons from a carbon nanotube cathode	Cedzyna k/Kielc, Poland	1-31
[Pub121]	IX Conference on Vacuum Technology and Workshop on Field Emission from Carboaceous Materials, June 6-9	M.Śmietana, P.Firek, R.Gronau, J.Szmidt	Diamond-liake carbon films applied in electronic devices	Cedzyna k/Kielc, Poland	18
[Pub122]	IX Conference on Vacuum Technology and Workshop on Field Emission from Carboaceous Materials, June 6-9	M.Śmietana, P.Firek, R.Gronau, J.Szmidt	Diamond-like carbon films applied in electronic devices	Cedzyna k/Kielc, Poland	1-18
[Pub123]	IX Conference on Vacuum Technology and Workshop on Field Emission from Carboaceous Materials, June 6-9	R.Mroczyński, M.Kalisz, P.Firek, M.Sochacki, R.B.Beck, J.Szmidt	Techniki plazmowe w technologii przyrządów półprzewodnikowych MISFET - referat ustny - wyróżniony	Cedzyna k/Kielc, Poland	1-4
[Pub124]	Microtherm 2011, Conference: Microtechnology and Thermal Problems in Electronics, June 28 - July 1	M.Waśkiewicz, P.Firek, K.Zdunek, J.Szmidt, R.Chodun, M.Sochacki	Electrioc properties of AIN deposited on SiC substrates by means of magnetron sputtering	Łódź, Poland	240-241

[Pub125]	Microtherm 2011, Conference: Microtechnology and Thermal Problems in Electronics, June 28 - July 1	P.Firek, H.Musaringo, M.Mroczkowski, J.Szmidt	Study of ohmic contacts to carbon layers containing palladium nanograins	Łódź, Poland	242-243
[Pub126]	Progress in Electromagnetics Research Symposium PIERS, March 20-23	M.Koba, T.Osuch, R.Piramidowicz, P.Szczepanski	Above threshold analysis of photonic crystal laser	Marrakesh, Morocco	
[Pub127]	TENCON 2011, Annual International Technical Conference of IEEE Region 10 Asia Pacific, November 21-24	J.Krupka, J.Mazierska	Current developments in contactless measurements of high quality materials for microelectronics and nanotechnology employing dielectric resonatotr techniques	Bali, Indonesia	1-5
[Pub128]	The Third International Workshop on Advanced Spectroscopy and Optical Materials (IWASOM'2011), July 17-22	A.Jusza, K.Anders, L.Lipińska, M.Baran, R.Piramidowicz	Optical properties of PMMA-based active nanocomposites doped with Tm:Y2O3 nanocrystals	Gdańsk, Poland	
[Pub129]	The Third International Workshop on Advanced Spectroscopy and Optical Materials (IWASOM'2011), July 17-22	K.Anders, A.Jusza, M.Baran, L.Lipińska, R.Piramidowicz	Emission properties of polymer composites doped with Er3+:Y2O3 nanopowders	Gdańsk, Poland	
[Pub130]	The Third International Workshop on Advanced Spectroscopy and Optical Materials (IWASOM'2011), July 17-22	R.Piramidowicz, K.Anders, A.Jusza, M.Malinowski, D.Pysz, R.Stępień	IR-to-visible up-conversion processes in erbium doped tellurite glasses	Gdańsk, Poland	
[Pub131]	Ultimate Integration of Silicon – ULIS 2011, March 14-16	R.Mroczyński	Specific features of fluorination of silicon surface region by RIE in r.f. CF4 plasma – novel method of improving electrical properties of thin PECVD silicon dioxide films,	Cork, Irlandia	no 5757960, pp. 66-69
[Pub132]	V Krajowa Konferencja Nanotechnologii, NANO2011, July 3-7	L.Lipińska, M.Baran, R.Piramidowicz, A.Jusza, K.Anders, M.Dudek, M.Nakielska, R.Diduszko	Optyczne nanokompozyty na bazie nanokryształów tlenkowych domieszkowanych jonami ziem rzadkich	Gdańsk, Poland	38-39
[Pub133]	VII Workshop of the Thematic Network on Silicon on Insular Technology, Devices and Cirsuits, EUROSOI 2011, January 17-19	B.Majkusiak, A.Mazurak, A.Kshirsagar, J.Rużyłło	Charging effects in the MOS structures with silicon nanocrystals embedded in SiO2	Granada, Spain	81-82
[Pub134]	Wiosenne Warsztaty Naukowe CZS, June 10-12	P.Firek, J.Szmidt, J.Kalenik, A.Werbowy, E.Czerwosz, E.Kowalska, M.Kozłowski, K.Fabiska, L.Paprocki	Technologia nowej generacji czujnika wodoru i jego związków dla zastosowań w warunkach ponadnormatywnych	Będlewo, Poland	
[Pub135]	XI Konferencja "Uniwersytet Wirtualny - model, narzędzia praktyka" VU'2011, June 20-22	K.Anders, M.Jusza, R.Piramidowicz	Ćwiczenia laboratoryjne w systemie e-LAB – Elektronika półprzewodnikowa	Warsaw, Poland	189-190
[Pub136]	XI Konferencja "Uniwersytet Wirtualny - model, narzędzia praktyka" VU'2011, June 20-22	P.Gdula, K.Anders, R.Piramidowicz	Ćwiczenia laboratoryjne w systemie e-LAB – Aktywne elementy światłowodowe	Warsaw, Poland	193-194
[Pub137]	XI Konferencja "Uniwersytet Wirtualny - model, narzędzia praktyka" VU'2011, June 20-22	R.Piramidowicz, K.Anders, M.Jusza, P.Gdula, P.Witoński, K.Madziar	Zajęcia laboratoryjne w kształceniu na odległość – System e-LAB	Warsaw, Poland	48-49

[Pub138]	XII Ogólnopolskie Seminarium Techniki Jonowe połączone z II Zimową Szkołą „Nanoinżynieria Powierzchni," March 2-5	A.Werbowy, P.Caban, P.Firek, K.Król, M.Sochacki	Badania właściwości materiałowych podłoży dla osadzania warstw C-Pd	Szklarska Poręba, Poland	43 - 45
[Pub139]	XII Ogólnopolskie Seminarium Techniki Jonowe połączone z II Zimową Szkołą „Nanoinżynieria Powierzchni," March 2-5	J.Szmidt, P.Firek, M.Kozłowski, E.Kowalska, K.Paprocki, A.Damięcki	Warswty diamentowe w zastosowaniach czujnikowych brak czegokolwiek	Szklarska Poręba, Poland	
[Pub140]	XII Ogólnopolskie Seminarium Techniki Jonowe połączone z II Zimową Szkołą „Nanoinżynieria Powierzchni," March 2-5	K.Nowakowska-Langier, R.Chodun, P.Firek, M.Waśkiewicz, K.Zdunek, J.Szmidt	Struktura i właściowści elektroniczne warswt AIN wytwarzanych w reaktywnym procesie rozpylania magnetronowego	Szklarska Poręba, Poland	
[Pub141]	XII Ogólnopolskie Seminarium Techniki Jonowe połączone z II Zimową Szkołą „Nanoinżynieria Powierzchni," March 2-5	M.Waśkiewicz, P.Firek, K.Zdunek, J.Szmidt, R.Chodun, K.Nowakowska-Langier	Cienkie warswty AIN wytwazrane na podłożach krzemowych metodą rozpylania magnetronowego	Szklarska Poręba, Poland	61 - 64
[Pub142]	XII Ogólnopolskie Seminarium Techniki Jonowe połączone z II Zimową Szkołą „Nanoinżynieria Powierzchni," March 2-5	P.Firek, J.Szmidt, M.Kozłowski, E.Czerwosz	Warstwy DLC w technologii czujnika wodoru nowej generacji	Szklarska Poręba, Poland	
[Pub143]	XIII Krajowa Konferencja Światłowody i Ich Zastosowanie, January 26-29	K.Welikow, P.Gdula, R.Buczyński, R.Piramidowicz	Modelowanie i optymalizacja strat zgięciowych w mikrostrukturalnych światłowodach plastikowych	Białystok-Białowieża, Poland	
[Pub144]	XIII Krajowa Konferencja Światłowody i Ich Zastosowanie, January 26-29	P.Gdula, K.Welikow, R.Piramidowicz	Modelowanie dyspersji chromatycznej w światłowodach mikrostrukturalnych metodą effective index	Białystok-Białowieża, Poland	
[Pub145]	XIII Krajowa Konferencja Światłowody i Ich Zastosowanie, January 26-29	R.Piramidowicz, P.Szczepański, P.Gdula, K.Welikow, R.Stępień, A.Filipkowski, D.Pysz, I.Kujawa, R.Buczyński	Mikrostrukturalne światłowody polimerowe do zastosowań w sieciach FTTH	Białystok-Białowieża, Poland	
[Pub146]	XIII Międzynarodowa Konferencja Naukowa (Quality, Safety and Ecology in Transport) QSET 2011, June 15-17	B.Czejdo, S.Bhattacharya, R.Mwaniki, M.Baszun	Close proximity robot navigation	Cracow – Niepołomice, Poland	1-8
[Pub147]	XIII Międzynarodowa Konferencja Naukowa (Quality, Safety and Ecology in Transport) QSET 2011, June 15-17	B.Czejdo, S.Bhattacharya, R.Mwaniki, M.Baszun	Sensor systems for close proximity robot navigation	Cracow – Niepołomice, Poland	1-7
[Pub148]	XXVII Krajowe Sympozjum Telekomunikacji i Teleinformatyki KSTiT, September 14-16	R.Krenz, K.Wesołowski, P.Szczepański, P.Gdula, K.Welikow, R.Piramidowicz, P.Zwierko, M.Natkaniec	Koncepcja systemów dostępowych do Internetu Przyszłości	Łódź, Poland	
[Pub149]	XXVIII-th IEEE-SPIE Joint Symposium on Photonics, Web Engineering, Electronics for Astronomy and High Energy Physics Experiments, May 23-29	K.Welikow, P.Gdula, R.Buczyński, R.Piramidowicz	Modeling and optimization of bending losses in microstructured plastic optical fibers	Wilga, Poland	

[Pub150]	XXVIII-th IEEE-SPIE Joint Symposium on Photonics, Web Engineering, Electronics for Astronomy and High Energy Physics Experiments, May 23-29	Ł.Sudoł, P.Gdula, K.Anders, R.Piramidowicz	Development of a simple, low-cost EDFA for applications in access systems	Wilga, Poland	
[Pub151]	XXVIII-th IEEE-SPIE Joint Symposium on Photonics, Web Engineering, Electronics for Astronomy and High Energy Physics Experiments, May 23-29	M.Dudek, A.Jusza, K.Anders, R.Piramidowicz	Studies on luminescent properties of praseodymium doped nanocomposite materials	Wilga, Poland	
[Pub152]	XXVIII-th IEEE-SPIE Joint Symposium on Photonics, Web Engineering, Electronics for Astronomy and High Energy Physics Experiments, May 23-29	P.Florczyk, K.Anders, A.Jusza, R.Piramidowicz, D.Pysz, R.Stępień	Erbium doped tellurite fibers for applications in green up-conversion fiber laser	Wilga, Poland	

6.4. Scientific and Technical Books

Number	Authors	Publisher	Title, volume, pages
[Pub153]	M.Borecki, M.L.Korwin-Pawłowski	CRC Press Taylor & Francis Group	Nanosensors – theory and applications in industry, healthcare and defense: Optical capillary sensors for intelligent classification of microfluidic samples, pp. 215-245
[Pub154]	M.Borecki, M.L.Korwin-Pawłowski, M.Bebłowska, J.Szmidt, M.Szmidt, M.Duk, K.Urbańska, A.Jakubowski	Fernando Sebastian Garcia Einschlag (Ed.)	Waste water – evaluation and management: Intelligent photonic sensors for application in decentralized wastewater systems, pp. 181-202
[Pub155]	B.Czejdo, S.Bhattacharya, M.Baszu	Heidelberg Springer	Digital information processing and communications: Use of multi-level state diagrams for robot cooperation in an indoor environment, vol. 189, pp. 411-425
[Pub156]	B.Galwas	Ośrodek Kształcenia na Odległość OKNO	Telekomunikacja Optoftalowa, pp. 1-15
[Pub157]	B.Galwas	Ośrodek Kształcenia na Odległość OKNO	Technika Wysokich Częstotliwości, pp. 1-27
[Pub158]	J.Woźnicki	Wydawnictwo LIBRON – Filip Lohner	Model funkcjonowania studiów doktoranckich. Doktoranci a obszary gospodarcze – szanse i zagrożenia współpracy: Studia doktoranckie w środodwiskowej strategii rozwoju szkolnictwa wyższego, pp. 19-23
[Pub159]	J.Woźnicki	Kasa im. Józefa Mianowskiego – Fundacja popierania Nauki	Nauka Polska jej potrzeby, organizacja i rozwój: O szansach rozwojowych szkolnictwa wyższegow Polsce, Vol. XLV No XX, pp. 13-15

7. PATENTS

[Pat1] M.Borecki, M.Bebłowska, K.Kopczyński, Z.Mierczyk, J.Szmidt, **Multilayer semiconductor photodetector** (Półprzewodnikowy fotodetektor wielowarstwowy), Zgłoszenie patentowe nr Z-397020, złożone w UP RP 17.11.2011

[Pat2] J.Kalenik, **The method for attaching electronics elements with the hybrid printed circuits** (Sposób dołączania elementów elektronicznych do obwodów drukowanych, układów hybrydowych), Patent UP RP, 22.09.2011

[Pat3] Z.Pióro, **A monitoring method of vertical displacement and vertical deflection change of building construction elements, especially of the roof, and a system for realization of this method,** Patent: application nuber – 13205068; confirmation number – 1195, 08.08.2011

[Pat4] Z.Pióro, **A set for fastening of measuring device, particularly rangefinder, to monitored element of building construction, especially of the roof, fastening method of measuringdevice using such set and suspension for fastening of measuring device,** Patent: application number – 13205075; confirmtion number – 1207, 08.08.2011

[Pat5] P.Ristola, J.Vilo, J.Piotrowski, **Apparatus for Microwave Heating of Planar Products**, (Laite tasomaisten tuotteiden mikroaaltolämmitystä varten; Urządzenie do mikrofalowego grzania płaskich produktów), Finnish Patent (Patenttijulkaisu) No.: FI 122204, Patent date (Patentti myönnetty): 14.10.2011

[Pat6] P.Ristola, J.Vilo, J.Piotrowski, **Waveguide Element**, (Aaltojohtoelementti; Falowodowy element), Finnish Patent (Patenttijulkaisu) No.: FI 122203, Patent date (Patentti myönnetty): 14.10.2011

[Pat7] P.Wrzosek, J.Szmidt, M.Borecki, M.Bebłowska, **Measurement head with optical capillary for selected liquid** parameters examination (Głowica pomiarowa z kapilarą optyczną do badania wybranych parametrów cieczy), Patent UP RP, 22.09.2011

8. REPORTS

[Rep1] **Application of ultra-shallow fluorine implantation to increasing MOS structures radiation damage hardness against high energy electrons (1MeV)** (Zastosowanie ultra-płytkiej implantacji fluoru do podniesienia odporności struktur MOS na radiację wysoko energetycznymi (1MeV) elektronami), project leader: Romuald B. Beck

[Rep2] **Center of Nanophotonics** (Centrum nanofotoniki), EU structural project, project leader: Paweł Szczepański

[Rep3] **Constructions and materials analysis for microsystems sensing** (Analiza konstrukcji i materiałów dla mikrosystemowych technik sensorowych), project leader: Jan Szmidt

[Rep4] **Design and manufacturing of complete microwave sensor based measurement system intended for electromagnetic properties investigations of grapheme,** (Opracowanie systemu z mikrofalową głowicą pomiarową w postaci rezonatora dielektrycznego do badań właściwości elektrycznych grafenu), project leader: Jerzy Krupka

[Rep5] **Development of CAD tools for multiprocessor and distributed computing environments** (Rozwój oprogramowania CAD pracującego w trybie wieloprocesorowym i rozproszonym), project leader: Wiesław Kuźmicz

[Rep6] **Emission properties of the active hybrid eutectic materials (**Właściwości emisyjne aktywnych eutektyków hybrydowych**),** project leader: Marcin Kaczkan

[Rep7] **Establishing of innovative, complementary laboratories dedicated to advanced research in micro-, nano- and optoelectronics,** (Utworzenie grupy innowacyjnych komplementarnych laboratoriów badawczych w obszarze mikro-, nano- i optoelektroniki), EU structural project, project leader: Paweł Szczepański

[Rep8] **Experimental study of the use of photonic technology in microwave oscillator circuits and the analysis of 3D structures using liquid crystal polarizing filter** (Wykorzystanie technik fotonicznych w układach oscylatorów mikrofalowych oraz analiza struktur 3D za pomocą filtra ciekłokrystalicznego), project leader: Janusz Parka

[Rep9] **Feasibility study of the novel nanometric silicon transistors and modelling of them for computer aided design of integrated circuits,** (Badania właściwości nanometrowych tranzystorów krzemowych o nowej konstrukcji i ich modelowanie dla potrzeb wspomagania projektowania (CAD) układów scalonych), project leader: Andrzej Pfitzner

[Rep10] **Future Internet Engineering,** (Inżynieria Internetu Przyszłości), EU Innovative Economy Programme, POIG.01.01.02-00-045/09, project leader: Paweł Szczepański

[Rep11] **Growth of the AlGaN/GaN/SiC-based semiconductor heterostructures by vapour phase epitaxy for the HEMTs applications**, (Wytwarzanie heterostruktur półprzewodnikowych AlGaN/GaN/SiC metodą epitaksji z fazy gazowej na potrzeby konstrukcji tranzystorów z dwuwymiarowym gazem elektronowym (HEMT)), project leader: Jan Szmidt

[Rep12] **High temperature spectroscopy of rare-earth doped crystals and nanocrystals for luminescence thermometry applications,** (Spektroskopia wysokotemperaturowa kryształów i nanokryształów tlenkowych domieszkowanych jonami ziem rzadkich dla zastosowań w termometrii luminescencyjnej), project leader: Michał Malinowski

[Rep13] **IDESA – 2 „Implementation of widespread IC design skills in advanced deep submicron technologies at European Academia",** (IDESA-2 "Rozpowszechnienie umiejętności projektowania submikronowych układów scalonych w europejskich wyższych uczelniach"), EU structural project, project leader: Wiesław Kuźmicz

[Rep14] **Innovative technologies of multi-functional materials and structures for nanoelectronics, photonics, spintronics and sensors InTechFun,** (Innowacyjne technologie wielofunkcyjnych materiałów i struktur dla nanoelektroniki, fotoniki, spintroniki i technik sensorowych InTechFun), EU structural project, project leaders: Jan Szmidt

[Rep15] **Investigation of coherent radiation sources for photonic integreated circuits made in SOI technology,** (Badania nad źródłami promieniowania koherentnego dla fotonicznych układów zintegrowanych wykonanych w technologii krzemowej), project leader: Paweł Szczepański

[Rep16] **Light generation in planar waveguide lasers based on two dimensional photonic crystals** (Generacja promieniowania w falowodowych laserach planarnych wykonanych na bazie dwu-wymiarowych kryształów fotonicznych), project leader: Paweł Szczepański

[Rep17] **Micro and nano-systems in chemistry and biomedical diagnostic - Task 2A: Capillary microfluidic sensors use in fertility diagnostics** (Mikro i nanosystemy w chemii i diagnostyce biomedycznej MNS-DIAG), EU structural project**,** project leader: Jan Szmidt

[Rep18] **Modeling and investigation of microphotonic structures and characterization of optically active materials** (Modelowanie, opracowanie i badanie mikro-struktur fotonicznych oraz charakteryzacja ośrodków optycznie aktywnych), project leader: Michał Malinowski

[Rep19] **Modeling and investigation of the double barrier metal-oxide-semicondutor tunnel structures,** (Modelowanie i badanie struktur tunelowych typu metal-izolator-półprzewodnik (MIS) z podwójną barierą potencjału), project leader: Bogdan Majkusiak

[Rep20] **New optoelectronics devices for intelligent classification of organic and biologic liquids.** (Nowe przyrządy optoelektroniczne do inteligentnej klasyfikacji cieczy organicznych i biologicznych), project leader: Jan Szmidt

[Rep21] **Process of spontaneous emission in photonic crystals,** (Proces emisji spontanicznej w kryształach fotonicznych), project leader: Paweł Szczepański

[Rep22] **Spectral conversion for solar cells using lanthanide ions** (**Konwersja widma słonecznego w systemach fotowoltaicznych z wykorzystaniem jonów ziem rzadkich**), project leader: Michał Malinowski

[Rep23] **Structural camera 3D-HD** (Strukturalna kamera 3D-HD), project leader: Piotr Garbat

[Rep24] **Technology and characterization of MIS structures with double gate dielectric stacks for non-volatile semiconductor memory (NVSM) applications** (Technologia i charakteryzacja struktur MIS z podwójną warstwą dielektryka bramkowego dla zastosowań w nieulotnych pamięciach półprzewodnikowych (NVSM)), project leader: Robert Paweł Mroczyński

[Rep25] **Technology of new generation of hydrogen and hydrogen compounds sensor for over normative conditions applications POIG "DETEH,"** (Opracowanie technologii nowej generacji czujnika wodoru i jego związków do zastosowań w warunkach ponadnormatywnych), EU structural project, project leader: Jan Szmidt

[Rep26] **The model of radiation generation in photonic crystal laser analysis**, (Model generacji promieniowania w laserach posiadających ośrodek aktywny w postaci kryształu fotonicznego), project leader: Paweł Szczepański

[Rep27] **The new optoelectronics method of intelligent classification of liquid bio-fuels properties with optical capillary use** (Nowa metoda optoelektroniczna inteligentnej klasyfikacji właściwości użytkowych biopaliw ciekłych z wykorzystaniem kapilar optycznych), project leader: Michał Borecki

[Rep28] **Tunable liquid crystal devices working on THz and GHz range,** (Przestrajalne ciekłokrystaliczne przetworniki na zakres THz i GHz.), project leader: Janusz Parka

[Rep29] **Universal laser source for medical applications,** (Uniwersalne źródło promieniowania laserowego do zastosowań medycznych), project leader: Wojciech Kamiński

[Rep30] **Upgrade of vocational skills in field of application of ecological and effective energy solutions in Poland. Photovoltaic systems**, (Wspieranie kwalifikacji zawodowych w zakresie stosowania ekologicznych i efektywnych rozwiązań elektro-energetycznych w Polsce. Systemy fotowoltaiczne), project leader: Maciej Juźwik

9. CONFERENCES, SEMINARS AND MEETINGS

9.1. Conferences

[Con1] **14th IEEE Symposium on Design and Diagnostics of Electronic Circuits and Systems, IEEE DDECS,** Cottbus, Germany, April 13-15
participants: T.Borejko, J.Kopański, W.A.Pleskacz, K.Siwiec

[Con2] **16th Annual Symposium of the IEEE Photonics Society Benelux,** Ghent, Belgium, December 1-2
participants: K.Ławniczuk, R.Piramidowicz, P.Szczepański

[Con3] **18th Int. Conference "Mixed Design of Integrated Circuits and Systems", MIXDES 2011,** Gliwice, Poland, June 16-18
participants: D.Kasprowicz, A.Pfitzner, W.Kuźmicz

[Con4] **23rd Int. Conference on Indium phosphide and Related Materials IPRM 2011,** Berlin, Germany, May 22-26
participants: K.Ławniczuk, R.Piramidowicz. P.Szczepański

[Con5] **35th International Microelectronics and Packaging IMAPS-CPMT Poland Conference,** Gdańsk-Sobieszewo, Poland, September 21-24
participants: M.Borecki, P.Firek, J.Kalenik, R.Kisiel, M.Mroczkowski, M.Sochacki, Z.Szczepański, J.Szmidt

[Con6] **3rd Int. Symp. on Advanced Plasma Science and its Applications for Nitrides and Nanomaterials ISPlasma2011,** Nagoya, Japan, March 6-9
participants: A.Jakubowski, L.Łukasiak, A.Malinowski

[Con7] **4th Int. Conf. on Plasma-NanoTechnology & Science, IC-PLANTS 2011,** Gifu, Japan**,** March 10-12
participants: A.Jakubowski, L.Łukasiak, A.Malinowski

[Con8] **9th International Conference Cyberspace,** Brno, Czech, November 25-26
participant: M.Baszun

[Con9] **CLEO/Europe-EQEC 2011, Conference on Lasers and Electro-Optics Europe and 12th European Quantum Electronics Conference,** Munich, Germany, May 22-26
participants: K.Anders, A.Jusza, M.Malinowski, R.Piramidowicz

[Con10] **Conference Frontiers in Optics (FiO) 2011/Laser Science (LS) XXVII**, San Jose, CA, USA, October 16-20
participant: P.Szczepański

[Con11] **EUROMAT 2011 - European Congress and Exhibition on Advanced Materials and Processes,** Montpellier, France September 12-15
participants: K.Anders, R.Piramidowicz

[Con12] **Hybrid Materials 2011, Second International Conference on Multifunctional, Hybrid and Nanomaterials,** Strasbourg, France, March 6-10
participants: K.Anders, A.Jusza, R.Piramidowicz

[Con13] **Int. Conference on Information Photonics, ICO,** Ottawa, Canada, May 18-20
participants: K.Ławniczuk, R.Piramidowicz. P.Szczepański

[Con14] **II Polska Konferencja Optyczna**, Międzyzdroje, Poland, June 27–July 1
participant: K.Ławniczuk

[Con15] **IX Conference on Vacuum Technology and Workshop on Field Emission from Carboaceous Materials,** Cedzyna k/Kielc, Poland, June 6-9
participants: R.B.Beck, P.Firek, R.Gronau,J.Kalenik, K.Król, M.Mroczkowski, M.Sochacki, J.Szmidt, M.Śmietana

[Con16] **Microtherm 2011, Conference: Microtechnology and Thermal Problems in Electronics,** Łódź, Poland, June 28 - July 1
participants: P.Firek, M.Mroczkowski, M.Sochacki, J.Szmidt

[Con17] **Progress in Electromagnetics Research Symposium PIERS,** Marrakesh, Morocco, March 20-23
participants: M.Koba, R.Piramidowicz, P.Szczepański

[Con18] **TENCON 2011, Annual International Technical Conference of IEEE Region 10 Asia Pacific,** Bali, Indonesia, November 21-24
participant: J.Krupka

[Con19] **Ultimate Integration of Silicon – ULIS 2011,** Cork, Irlandia, March 14-16
participant: R.Mroczyński

[Con20] **V Krajowa Konferencja Nanotechnologii, NANO2011,** Gdańsk, Poland, July 3-7
participants: K.Anders, A.Jusza, R.Piramidowicz

[Con21] **XI Konferencja "Uniwersytet Wirtualny - model, narzędzia praktyka" VU'2011,** Warsaw, Poland, June 20-22
participants: K.Anders, P.Gdula, M.Jusza, K.Madziar, R.Piramidowicz, P.Witoński

[Con22] **XIII Krajowa Konferencja Światłowody i Ich Zastosowanie,** Białystok-Białowieża, Poland, January 26-29
participants: P.Gdula, R.Piramidowicz, K.Welikow

[Con23] **XIII Międzynarodowa Konferencja Naukowa (Quality, Safety and Ecology in Transport) QSET 2011,** Cracow – Niepołomice, Poland, June 15-17
participant: M.Baszun

[Con24] **XXVII Krajowe Sympozjum Telekomunikacji i Teleinformatyki KSTiT,** Łódź, Poland, September 14-16
participants: P.Gdula, R.Piramidowicz, P.Szczepański, K.Welikow

[Con25] **XXVIII-th IEEE-SPIE Joint Symposium on Photonics, Web Engineering, Electronics for Astronomy and High Energy Physics Experiments,** Wilga, Poland, May 23-29
participants: K.Anders, P.Gdula, A.Jusza, R.Piramidowicz, K.Welikow

9.2. Schools, Seminars and Meetings

[Con26] **21st International Travelling Summer School on Microwaves and Lightwaves 2011,** Darmstadt, Germany, July 9-15
participants: B.Galwas, R.Piramidowicz, P.Szczepański, K.Welikow

[Con27] **34th International Spring Seminar on Electronics Technology ISSE'2011,** High Tatras, Slovakia, May 11-15
participants: R.Kisiel, M.Sochacki, Z.Szczepański

[Con28] **40th Winter School on Wave and Quantum Acoustics and 16th Winter Workshop on Photoacoustics and Thermal Wave Methods,** Szczyrk, Poland, February 27 – March 3
participants: P.Firek, J.Szmidt

[Con29] **58th Spring Meeting of Japanese Society of Applied Physics,** Kanagawa, Japan, March 17-20
participants: A.Jakubowski, L.Łukasiak, A.Malinowski

[Con30] **Institute Semianr:** Technologie terahercowe, March 17
participants: R.Piramidowicz, P.Szczepański, N.Kwietniewski, J.Szmidt, M.Śmietana

[Con31] **Institute Semianr:** Precyzyjne wygładzanie nierówności w bardzo twardym materiale, - co umożliwia nam plazma w procesach trawienia węglika krzemu, May 26
participants: J.Szmidt, R.Piramidowicz, P.Szczepański, N.Kwietniewski, M.Śmietana

[Con32] **The Third International Workshop on Advanced Spectroscopy and Optical Materials (IWASOM'2011),** Gdańsk, Poland, July 17-22
participants: K.Anders, A.Jusza, M.Malinowski, R.Piramidowicz

[Con33] **VII Workshop of the Thematic Network on Silicon on Insular Technology, Devices and Cirsuits, EUROSOI 2011,** Granada, Spain, January 17-19
participant: B.Majkusiak

[Con34] **Wiosenne Warsztaty Naukowe CZS,** Będlewo, Poland, June 10-12
participants: P.Firek, J.Kalenik, J.Szmidt, A.Werbowy

[Con35] **XII Ogólnopolskie Seminarium Techniki Jonowe połączone z II Zimową Szkołą „Nanoinżynieria Powierzchni,"** Szklarska Poręba, Poland, March 2-5
participants: P.Firek, K.Król, M.Sochacki, J.Szmidt, A.Werbowy

10. AWARDS

[Award1] Piotr Firek, **WUT Rector's Individual Award for Scientific Achievements in 2010** (Nagroda Indywidualna I stopnia JM Rektora PW za osiągnięcia naukowe w roku 2010)

[Award2] Ryszard Kisiel, **WUT Rector's Individual Award for Scientific Achievements in 2010** (Nagroda Indywidualna I stopnia JM Rektora PW za osiągnięcia naukowe w roku 2010)

[Award3] Katarzyna Ławniczak, **Diploma for distinctive presentation "Fotoniczne lasery wieloczęstotliwościowe wytworzone metodą Multi- project wafer run" during II Polish Optical Conference in Międzyzdroje, Poland** (Dyplom za wyróżniającą się pracę: "Fotoniczne lasery wieloczęstotliwościowe wytworzone metodą Multi- project wafer run" na II Polskiej Konferencji Optycznej w Międzyzdrojach)

[Award4] Katarzyna Ławniczak, **Grant Award for presentation "AWG – based multiwavelenght lasers fabricated in a multi-project wafer run" during Int. Conference on Information Photonics, ICO, Ottawa, Canada,** (Grant za prezentację plakatu "AWG – based multiwavelenght lasers fabricated in a multi-project wafer run" podczas Int. Conference on Information Photonics, ICO, Ottawa, Canada)

[Award5] Katarzyna Ławniczak, **The prize for presentation „Photonic integrated devices for research institutes, SMEs and large companies" in 4rd International Forum Science & Technology Days POLAND – EAST "** (Nagroda zaprezentację na IV Międzynarodowym Forum Dni Nauki i Technologii Polska-Wschód)

[Award6] Jan Szmidt, **Special Award "For the special involvement and significant support to the development of the Science & Technology Days Poland-East Forum idea". 4rd International Forum Science & Technology Days POLAND – EAST,** (Nagroda Specjalna za szczególne zaangażowanie i wkład w rozwój przedsięwzięcia na IV Międzynarodowym Forum Dni Nauki i Technologii Polska-Wschód)

[Award7] Jan Szmidt, Ryszard Kisiel, Zbigniew Szczepański, Mariusz Sochacki, Piotr Firek, Norbert Kwietniewski, **WUT Rector's Collective Award for Scientific Achievements during years 2009-2010 in the fields of constructing, modeling, generating and characterizing of semiconductors on SiC, (first degree),** (Nagroda Zespołowa I stopnia JM Rektora PW za osiągnięcia naukowe w latach 2009-2010, za realizację zadań z obszaru konstrukcji, modelowania, wytwarzania i charakteryzacji przyrządów półprzewodnikowych na bazie węglika krzemu)

[Award8] Mateusz Śmietana, **WUT Rector's Individual Award for Scientific Achievements in 2010** (Nagroda Indywidualna I stopnia JM Rektora PW za osiągnięcia naukowe w roku 2010)

[Award9] Jerzy Woźnicki **Commander's Cross: Polonia Restituta** (Krzyż Komandorski z Gwiazdą Orderu Odrodzenia Polski, wręczony przez Prezydenta RP)