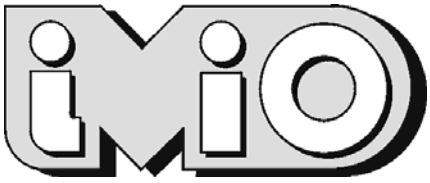
INSTITUTE OF MICROELECTRONICS AND OPTOELECTRONICS



ANNUAL REPORT

2006

Edited by Agnieszka Mossakowska-Wyszyńska

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From the Director

This Annual Report summarizes the research activities of the Institute In 2006, as well as the teaching activities in the academic year 2005/2006. The activities of the Institute in the field of electronics and computer engineering are concentrated in the area of broadly defined microelectronics and optoelectronics. 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 5th and 6th UE Framework Programme.

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. 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 2007

Professor Andrzej Jakubowski, 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 six divisions:

- Microelectronics and Nanoelectronics Devices Division;
- VLSI Engineering and Design Automation Division;
- Microwave Electronics and Photonics Division;
- Microsystem and Electronic Material Technology Division;
- Optoelectronics Division;
- Image Processing 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 5th and 6th UE Framework Programme, e.g. REASON, TUF, SINANO, EUROSOI, BIPV-CIC, NEMO.
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

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1.3. Microelectronics and Nanoelectronics Devices Division

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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

Tomasz Bieniek, M.Sc.	Ph.D. Student
Jarosław Grabowski, M.Sc.	Ph.D. Student
Marcin Iwanowicz, M.Sc.	Ph.D. Student
Jakub Jasiński, M.Sc.	Ph.D. Student
Małgorzata Kalisz, M.Sc.	Ph.D. Student
Andrzej Mazurak, M.Sc.	Ph.D. Student
Robert Mroczyński, M.Sc.	Ph.D. Student
Jędrzej Stęszewski, M.Sc.	Ph.D. Student

Technical and administrative staff

Witold Ciemiewski,
Kazimierz Dalbiak,
Krzysztof Krogulski,
Małgorzata Trzaskowska.

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

To name a few examples of its research topics:

- Modelling and investigation on kinetics of silicon oxidation (particularly of the beginning stages of the process);
- Diagnostics and characterisation of properties of single and double insulating layers (gate stack including ultra thin oxide layers) by means of electrical measurements analysis;
- Wear-out and degradation processes in MOS structures (breakdown of dielectrics layers, hot carriers effects, radiation damage effects);
- Transport mechanism and quantum effects in MOS structures (transistor, tunnel diode) with ultra thin oxide;
- New materials (semiconductors and dielectrics) for microelectronics applications (e.g.: diamond-like-carbon, boron nitride, silicon carbide, gallium nitride, silicon-germanium, barium titanate);
- 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;
- MEMS/MOEMS processing.

1.4. VLSI Engineering and Design Automation Division

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Elżbieta Piwowarska, Ph.D.	Assistant Professor
Witold Pleskacz, Ph.D.	Assistant Professor
Andrzej Wielgus, Ph.D.	Assistant Professor
Adam Wojtasik, Ph.D.	Assistant Professor
Marek Niewiński, Ph.D.	Lecturer

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Piotr Markowski, M.Sc.	Ph.D. Student
Michał Rakowski, M.Sc.	Ph.D. Student, Assistant

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Stanisław Jeszka, M.Sc.

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

Current research projects in the Division include:

- methodologies of integrated circuit design for manufacturability: application of statistical process and device simulation in IC design, investigations of spatial on-chip correlation of random process disturbances, analysis of layout sensitivity to spot defects;
- design of analogue VLSI circuits: analogue implementations of fuzzy logic controllers for biomedical applications, methodologies of testing and design for testability of analogue VLSI integrated circuits;
- development of CAD tools for integrated circuit design and verification, with special emphasis on analogue full custom ASICs design;

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- investigations of signal propagation and crosstalk in long interconnections in deep submicron VLSI circuits;
- design of digital and mixed VLSI circuits for special applications: CNN, data processing in physical experiments, etc.;
- modeling and control of leakage currents in nanometer CMOS digital circuits.

1.5. Microwave Electronics and Photonics Division

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Piotr Witoński, Ph.D.	Assistant Professor
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Krzysztof Madziar, M.Sc.	Ph.D. Student
Łukasz Niestoruk, M.Sc.	Ph.D. Student
Daniel Paluch, M.Sc.	Ph.D. Student

Technical and administrative staff

Bożena Janus

The research activity of the Microwave Electronics and Photonics Division is concerned with propagative electronics and microwave photonics. The characteristic feature of the electronics branch is the comparability between the time of system state change and the time of signal propagation between particular system points.

The research activity of the Microwave Electronics and Photonics Division is concentrated on:

- 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;
- analysis methods of transmission lines for modern mm-wave microwave integrated circuits.

From the new topics of research activity we can mention:

- modelling and computer aided design of microwave devices and circuits;
- microwave sensors for industrial applications;
- 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 semiconductor optical devices for telecommunication;
- optoelectronic and microwave devices for data transmission networks.

1.6. Electronic Materials and Microsystem Technology Division

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Michał Borecki, Ph.D.	Assistant Professor
Jerzy Kalenik, Ph.D.	Assistant Professor
Ryszard Kisiel, Ph.D.	Assistant Professor
Zdzisław Mączeński, Ph.D.	Assistant Professor
Stanisław Pietruszko, Ph.D.	Assistant Professor
Janusz Rogowski, Ph.D.	Assistant Professor
Zbigniew Szczepański, Ph.D.	Assistant Professor
Aleksander Werbowy, Ph.D.	Assistant Professor

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Konrad Kiełbasiński, M.Sc.	Ph.D. Student
Krzysztof Kłos, M.Sc.	Ph.D. Student
Mariusz Sochacki, M.Sc.	Ph.D. Student
Artur Szczęsny, M.Sc.	Ph.D. Student, Assistant
Mateusz Śmietana, M.Sc.	Assistant
Paweł Śniecikowski, M.Sc.	Ph.D. Student
Tomasz Zychowicz, M.Sc.	Ph.D. Student

Technical and administrative staff

Ryszard Biaduń,
Krystyna Szylko.

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

Junior academic staff

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Marcin Koba, M.Sc.	Ph.D. Student
Radosław Kreft, M.Sc.	Ph.D. Student
Kamila Leśniewska-Matys, M.Sc.	Ph.D. Student
Magdalena Nakielska, M.Sc.	Ph.D. Student
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Technical and administrative staff
Wojciech Kamiński, Ph.D.

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

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

The main research activity of the Division comprises:

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

1.8. Image Processing Division

Head of the Division
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Marek Sutkowski, Ph.D.	Assistant Professor

Technical and administrative staff
Jerzy Domański, M.Sc.

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

- theoretical principles of image modelling;
- numerical methods of image analysis;
- implementation of digital image processing for detection, inspection and identification of objects;
- application of image processing methods for diagnostic control and measurement systems in industry, medicine, research and commerce;
- electro optic effects in liquid crystals and their applications to LCD;
- photo refractive phenomena's in liquid crystals for dynamic holography and optical data storage.

1.9. Statistical Data

SPECIFICATION	2005	2006	DIFFERENCE
Academic staff	83	85	+2
Tenured professors	8	8	0
Professors	5	6	+1
Associate professors	2	1	-1
Assistant professors	32	32	0
Senior lecturers	6	4	-2
Lecturers	1	1	0
Assistants and Ph.D. students	29	33	+4
Technical staff	13	11	-2
Administrative staff	5	5	0
Space	3254,9	3074,4	-180,5
Teaching laboratories	1275,9	1275,9	0
Other laboratories	341,3	341,3	0
Offices of academic staff	1637,7	1457,2	-180,5
Computers	301	313	+12
Library resources - Books (number of volumes)	3357	3432	+75
Teaching activities	56	55	-1
Basic courses	38	38	0
Advanced courses	15	14	-1
Special courses	3	3	0
Research projects	41	32	-9
Granted by the University	11	8	-3
Granted by State Institutions	19	15	-4
Granted by International Institutions	8	6	-2
Other projects	3	3	0
Degrees awarded	58	79	+21
D.Sc. degrees	0	0	0
Ph.D. degrees	5	6	+1
M.Sc. degrees	23	38	+15
B.Sc. degrees	30	35	+5
Publications	178	142	-36
Sci.-tech. books	11	3	-8
Sci.-tech. papers in journals	44	25	-19
Sci.-tech. papers in conference proceedings	123	114	-9
Reports	43	32	-11
Conferences	47	45	-2
Organised by the Institute	0	3	+3
Others	47	42	-5
Patents	0	2	+2
Prizes	2	9	+7

2. STAFF

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3. TEACHING ACTIVITIES

3.1. Basic Courses

[Edu1] **Application of Matlab in Calculation Methods** (Matlab w zastosowanych metodach obliczeniowych) **MZMO**, Mikołaj Baszun

[Edu2] **CAD for PCB (PADS)** (Wspomaganie komputerowe projektowania obwodów drukowanych), **PADS**, Ryszard Kisiel, Jerzy Kalenik

[Edu3] **Characterisation of Microelectronic Structures and Technologies** (Charakteryzacja struktur i technologii mikroelektronicznych), **CSTM**, Bogdan Majkusiak

[Edu4] **CAD and Fabrication of Microwave and Lightwave Circuits** (Komputerowe projektowanie i realizacja obwodów mikrofalowych i optofalowych), **KPROM**, Jerzy Skulski

[Edu5] **Design of Integrated Systems in VLSI Technique** (Projektowanie systemów scalonych w technice VLSI), **PSSV**, Zbigniew Jaworski

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

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

[Edu8] **Equipment - Programming Synthesis of Digital Systems** (Synteza sprzętowo – programowa systemów cyfrowych), **SSP**, Elżbieta Piwowarska

[Edu9] **Fields and waves**, (Pola i fale), **POFA**, Jerzy Piotrowski

[Edu10] **Fundamentals of Circuit and System Technology** (Podstawy technologii układów i systemów), **PTUIS**, Romuald Beck

[Edu11] **Fundamentals of Lasers** (Lasery - kurs podstawowy), **LKP,** Paweł Szczepański

[Edu12] **Fundamentals of Microelectronics** (Podstawy mikroelektroniki), **PMK**, Wiesław Kuźmicz

[Edu13] **Fundamentals of Microprocessor Techniques** (Podstawy techniki mikroprocesorowej), **TMIK**, Lidia Łukasiak

[Edu14] **Fundamentals of Microwave Engineering** (Podstawy techniki w.cz.), **TWCZ**, Bogdan Galwas

[Edu15] **Fundamentals of Photonics** (Podstawy fotoniki), **FOT**, Michał Malinowski

[Edu16] **Fundamentals of Solid State Electronics** (Elektronika ciała stałego), **ELCS**, Jan Szmidt, Witold Pleskacz

[Edu17] **Hybrid Systems** (Układy hybrydowe), **UKH**, Ryszard Kisiel

[Edu18] **Integrated Optoelectronics** (Optoelektronika zintegrowana), **OZT**, Michał Malinowski, Agnieszka Mossakowska-Wyszyńska

[Edu19] **Introduction to Microsystems** (Wstęp do mikrosystemów), **WMS,** Zbigniew Pióro

[Edu20] **Introduction to the UNIX System** (Użytkowanie systemu UNIX), **USUX**, Andrzej Wielgus

[Edu21] **Laser Physics** (Fizyka laserów), **FLA**, Paweł Szczepański

[Edu22] **Logic Circuits** (Układy logiczne), **ULOGE**, Tadeusz Łuba

[Edu23] **Microelectronics Development Trends** (Kierunki rozwoju mikroelektroniki), **KRM**, Andrzej Jakubowski

[Edu24] **Models and Systems of Image Processing** (Modele i systemy przetwarzania obrazów), **MSPO**, Jerzy Woźnicki

[Edu25] **Numerical Methods** (Metody numeryczne), **MNM**, Institute of Electronic Fundamentals WUT, Jerzy Krupka

[Edu26] **Object Programming in Java** (Praktyka programowania obiektowego w Javie), **PPOJ**, Adam Wojtasik

[Edu27] **Object Programming** (Programowanie obiektowe), **PROBI**, Adam Wojtasik

[Edu28] **Operating Systems** (Systemy operacyjne), **SOE**, Andrzej Wielgus

[Edu29] **Optoelectronic Devices and Systems** (Elementy i systemy optoelektroniczne), **ESO**, Michał Malinowski

[Edu30] **Light wave Telecommunication** (Telekomunikacja optofalowa), **TEOP**, Bogdan Galwas

[Edu31] **Physical Fundamentals of Information Processing** (Fizyczne podstawy przetwarzania informacji), **FPPI**, Bogdan Majkusiak

[Edu32] **Physics of Solid State** (Fizyka ciała stałego), **FCSR**, Jan Szmidt

[Edu33] **Programming 8051 micro controller** (Programowanie mikrokontrolera), **PMIK**, Lidia Łukasiak

[Edu34] **Semiconductor Devices** (Przyrządy półprzewodnikowe), **PP**, Andrzej Jakubowski, Andrzej Pfitzner

[Edu36] **Standard cell based VLSI design e** (Projektowanie układów VLSI w stylu komórek standardowych), **PUVS**, Zbigniew Jaworski

[Edu35] **Surface Mounting Technology** (Technologia montażu powierzchniowego), **TMP**, Ryszard Kisiel

[Edu37] **Technology of Integrated Circuits Fabrication** (Technologia monolitycznych układów scalonych), **TWMUS**, Romuald Beck

[Edu38] **Thick film sensors** (Grubowarstwowe czujniki pomiarowe), **GCZP**, Zbigniew Szczepański

3.2. Advanced Courses

[Edu39] **Advanced Microelectronic and Optoelectronic Technologies** (Zaawansowane technologie mikroelektroniczne i optoelektronczne), **ZTMO**, Romuald Beck

[Edu40] **Advanced Physical Fundamentals of Optoelectronics** (Zaawansowane podstawy fizyczne optoelektroniki), **ZPFO**, Paweł Szczepański

[Edu41] **Design of VLSI Circuits** (Projektowanie struktur scalonych VLSI), **PSSCV**, Wiesław Kuźmicz

[Edu42] **Digital Image Processing** (Cyfrowe przetwarzanie obrazów), **CPOO**, Piotr Garbat

[Edu43] **Electronic and Photonic Devices for Telecommunication** (Przyrządy elektroniki i fotoniki dla telekomunikacji), **PEFT**, Bogdan Galwas

[Edu44] **Fundamentals of Photovoltaics** (Podstawy fotowoltaiki), **PFOT,** Stanisław Pietruszko

[Edu45] **Integrated and Logic Circuits for Optoelectronics** (Zintegrowane układy optoelektroniczne i optyczne układy logiczne), **ZOUL**, Michał Malinowski

[Edu46] **Lasers – Advanced Course** (Lasery - kurs zaawansowany), **LKZ,** Paweł Szczepański

[Edu47] **Nanotechnologies** (Nanotechnologie), **NAN**, Jan Szmidt

[Edu48] **Optical Waveguide Lasers and Amplifiers**(Wzmacniacze i lasery światłowodowe), **WLS**, Ryszard Piramidowicz

[Edu49] **Optoelectronics Techniques of Information Processing** (Optoelektroniczne techniki przetwarzania informacji) ,**OTZI**, Janusz Parka, Jerzy Woźnicki

[Edu50] **Physical Fundamentals of Nanoelectronics** (Podstawy fizyczne nanoelektroniki), **PFN**, Bogdan Majkusiak

[Edu51] **Photovoltaic Systems** (Systemy fotowoltaiczne), **SFOT,** Stanisław Pietruszko

[Edu52] **Semiconductor Structures for VLSI and ULSI Circuits** (Struktury półprzewodnikowe dla układów VLSI i ULSI), **SPVU**, Andrzej Jakubowski

3.3. Courses in English

[Edu53] **Electronics 1, EELE1,** Bogdan Majkusiak

[Edu54] **Physics 3, A,** Bogdan Majkusiak

[Edu55] **Quality Management, EQUMA,** Zdzisław Mączeński

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 projektowania oraz metod wytwarzania i badania materiałów i przyrządów w dziedzinie mikroelektroniki i optoelektroniki), project leader: Andrzej Jakubowski, July 2005 - March 2006, **sub-projects:**

[Pro1.1] **Analysis of boundary condition of the molecular gas flow, model construction and its implementation in Moly Flow..er Plus Statistics computer program** (Analiza warunków brzegowych przepływu molekularnego i opracowanie modułu programu Moly Flow..er Plus Statistics realizującego obliczenia symulacyjne dla różnych warunków brzegowych), sub-project leader: Piotr Szwemin, co-worker: Marek Niewiński

[Pro1.2] **Fibre optical sensor of loading with controllable sensitivity study and realization** (Opracowanie i wykonanie światłowodowego czujnika obciążenia o regulowanej czułości), sub-project leader: Michał Borecki, co-workers: J. Szmidt, J. Krupka, J. Kalenik, R. Kisiel, M. Bebłowska, P. Wrzosek , R. Biadań, K. Szylko

The aim of this work is the study of coherent mathematical models describer the working of sensor as optoelectronics system. The compatibility investigations of mathematical models with experiment will be realized in frames of mentioned task. The sensor of loading will be proposed and made of this base. The head with defined sensitivity and the system of detection with controllable responsivity construction will be out worked. The optical feed and detection dedicated system becomes worked out with proposed mathematical models.

[Pro1.3] **Formation and characterization of structures with ultra thin SiO_xN_4 layers on substrates containing SiGe"** (Wytwarzanie i charakteryzacja struktur z ultracienką warstwą SiO_xN_y na podłożach zawierających warstwy SiGe), sub-project leader: R.B. Beck, co-workers: T. Bieniek, W Ciemiewski, K. Dalbiak, A. Jakubowski, M. Kalisz, L. Łukasiak, B. Majkusiak, R. Mroczyński, J. Szmidt, A. Werbowy, M. Trzaskowska

The project aims at experimental study of methods of ultra thin SiO_xN_y layer formation on substrates strained due to the presence of SiGe layers. Particular attention must be paid to preserve the strain through complete test structure fabrication by appropriate changes in the device technology.

[Pro1.4] **Investigations of effectiveness of CAD algorithms in distributed multiprocessor environment** (Badania efektywności algorytmów CAD realizowanych w wersji wieloprocesorowej i rozproszonej), sub-project leader: Wiesław Kuźmicz

Many algorithms in CAD software can be divided into multiple tasks executed independently and concurrently. Such tasks, when executed simultaneously on multiple processors or computers, allow to speed up the algorithms by orders of magnitude. However, this requires appropriate hardware and system software infrastructure and adaptation of the respective CAD algorithms. Problems of synchronization of independent processes and intercommunication must be solved.

In this work an experimental multi computer platform based on a student lab equipped with computers running Mac OS X operating system will be built and investigated. Mac OS X includes an "XGrid" component which allows to set up a network of computers and use it as a single multiprocessor supercomputer. Several selected CAD algorithms will be adapted for this distributed environment. Experiments with circuit extraction, process and device simulation and possibly with applications of evolutionary algorithms in CAD design tasks are envisaged.

[Pro1.5] **Investigation of LC-cells' photo refractive and electro-optical properties** (Badanie właściwości elektrooptycznych i fotorefrakcyjnych przetworników ciekłokrystalicznych), sub-project leader: Janusz Parka

Electro-optical and photo refractive properties of thin liquid crystal cells under low power illumination have been investigated and tested. Diffraction efficiency and dynamic properties of the cells contained different photosensitive layers and LC materials were measured. Dynamic holograms have been writing in these cells. Examined LC samples have acceptable parameters for special applications. Model of physical phenomena in this kind of cells was proposed.

[Pro1.6] **Measurements of the complex permittivity of silicon at microwave frequencies** (Badanie zespolonej przenikalności elektrycznej w zakresie częstotliwości mikrofalowych), sub-project leader: Jerzy Krupka, co-workers: Mikołaj Baszun, Zdzisław Mączeński, Janusz Rogowski, Jerzy Rudkowski

The aim of this project is development of new methods of the complex permittivity and resistivity measurements of high-resistivity Silicon samples. Currently such material is applied in manufacturing of microwave integrated systems and planar antennae especially at millimeter frequency range. Specific goals of this project are:

- Development of new complex permittivity measurement technique;
- Design and manufacturing of microwave test resonator;
- Measurements of high resistivity silicon samples;
- Research results dissemination through publications at international conferences.

[Pro1.7] **Modelling and investigation of waveguide amplifying and lasing structures** (Modelowanie i badanie światłowodowych struktur wzmacniających i laserowych), sub-project leader: Michał Malinowski

[Pro1.8] **PC Signal Analyser** (Komputerowy analizator sygnałów), sub-project leader: Jerzy Skulski, co-workers: Bogdan Galwas, Jerzy Piotrowski, Tomasz Odalski, Grzegorz Dorosz

The goal of this project is development and fabrication of a model of the computer-based microwave signal analyzer. There is foreseen realization of the model which consists of two functional parts: measurement block and personal computer. The measurement block has been elaborated in analog-digital technology.

[Pro2] **The Development of Processing and Testing Methods of Electronic Materials, and Design and Characterisation of the Devices for Microelectronics and Optoelectronics** (Rozwój metod wytwarzania i badania materiałów oraz modelowania i charakteryzacji przyrządów w dziedzinie mikroelektroniki i optoelektroniki), project leader: Paweł Szczepański, April 2006 - September 2007,

[Pro2.1] **Fabrication and characterisation of test strucutres with SiOxNy ultrathin dielectric layers high-K gtate stack on silicon substrates,** (Wytwarzanie i charakteryzacja struktur z układem ultracienkich warstw dielektrycznych zwierających warstwę SiO_xN_y na oraz dielektryk o wysokiej przenikalności dielektrycznej na podłożach krzemowych), sub-project leader: R.B. Beck, co-workers: T. Bieniek, W Ciemiewski, K. Dalbiak, A. Jakubowski, M. Kalisz, L. Łukasiak, B. Majkusiak, R. Mroczyński, J. Szmidt, A. Werbowy, M. Trzaskowska

The project aims in integration ultrathin oxyntride layers withhigh-K gate stack technology.

[Pro2.2] **Investigation of photoconductive properties in polymer - liquid crystal image transducers,** (Badania właściwości fotoprzewodzących złącza w układzie polimer-ciekły kryształ w ciekłokrystalicznych przetwornikach obrazowych), sub-project leader: Janusz Parka

Optical and electro optical properties for polymer (PVK +TNF) and liquid crystal transducers were investigated. Charge generation effects were observed and described. Electro optical characteristics of these transducers were measured. The light amplification coefficient for coherent light was appointed. The amplification is a result of energy transfer between two-beams coupling processes.

[Pro2.3] **Microwave Photonic Dispersive Filters** (Mikrofalowe fotoniczne filtry dyspersyjne), sub-project leader: Bogdan Galwas, co-workers: Agnieszka Szymańska, Jarosław Dawidczyk, Jerzy Piotrowski, Jerzy Skulski, Paweł Wojtyra

Conventional digital and analog signal-processing have limited signal bandwidth which does not exceed a gigahertz, and nowadays, when the need for high bandwidth signal processing is growing, some other solutions are required. Novel microwave photonic filters can process signals of high gigahertz bandwidth which is of great importance in real-time processing of radar signals and broadband wireless access networks. The aim of this work is the study of mathematical description of various microwave photonic filters with dispersive media, development of suitable for simulations models of filters, and investigations of filters' characteristics.

[Pro2.4] **Modelling and investigation of amplifier and laser structures with limit dimension** (Modelowanie i badanie struktur wzmacniających i laserowych o ograniczonej wymiarowości), sub-project leader: Michał Malinowski

[Pro2.5] **Simulation of manufacturing processes in nanometer scale CMOS integrated circuits** (Metody symulacji procesów produkcji nanometrowych układów scalonych CMOS), sub-project leader: Wiesław Kuźmicz

The goal of this work is to develop new models of manufacturing processes and new methods of device modeling for nanometer scale CMOS intergated circuits. CMOS technologies with channel length below 100 nm require new approaches to process simulation and device modeling. The doping processes used and doping profiles obtained differ from those typical for older technologies. In nanometer scale MOS devices new physical phenomena, such as quantum effects and tunneling currents, are aboserved and must be accounted for.

New process models and device modeling methods will be used in CLEAN, the European FP6 integrated project. In particular, new advanced postimplantation doping profiles will be investigated, methods of theoretical calculation of MOS device parameters will be developed as well as modeling methods for leakage currents.

[Pro2.6] **The characterization of electronic materials and proposals of construction for sensors technics, (**Charakteryzacja materiałów elektronicznych i propozycje konstrukcji dla techniki sensorowej**),** sub-project leader: Jan Szmidt

The work consist of two tasks:

1. Microwave resonators – new technologies and their applications in measurements of ferroelectrics.
2. The proposals of construction of optical components for sensors technics.

The main goals of Task 1 are: development of new dielectric resonators with Bragg reflectors and development of new techniques for the complex permittivity measurements of ferroelectrics. This work is related to Polish contribution in Polish-Australian linkage grant (LX0561280) entitled: „Microwave characterization of new magnetic and dielectric structures and materials" awarded by Australian Research Council to James Cook University (Townsville), University of Western Australia, Massey Universisy (New Zealand) and Warsaw University of Technology.

The Task 2 range are the study and proposal of components construction for sensors heads executed from modified optical fibers. Such constructions proclaim up, in investigation, the next step in the monitoring of specific proprieties liquid with very small volumes. The method of valuation of sensibility of proposed constructions will be worked out. The additional study will be guided in sense of head of sensors from optical fibers with are covered with thin dielectric film.

The experimental verification of proposed method will be done in Canadian Centre de recherche the en photonique Universite the du of Quebec en Outaouais.

[Pro3] **Electrical charcterization of MOS SOI structures,** (Charakteryzacja struktur MOS SOI metodami elektrycznymi), project leader: L. Łukasiak, co-workers: A. Jakubowski, J. Dobrowolski, Z. Nosal, S. Szostak, W. Wiatr, July 2006 – December 2006

The main goal of the project was studying the influence of electrophysical parameters of the investigated structures on their high-frequency properties.

[Pro4] **Electronics properties of c-BN thick films on silicon p-type substrate,** (Właściwości elektryczne grubych warstw kubicznego azotku boru (c-BN) na podłożach krzemowych typu n), project leader: Aleksander Werbowy, co-workers: Piotr Firek, May 2006 – December 2006

The c-BN pastes were screen printed on n-type <100> silicon substrates and fired at 850ºC with the use of standard thick film procedures. Subsequently, round aluminum (Al) electrodes were evaporated on the top of deposited layers. Thus metal-insulator-semiconductor (MIS) structures were crated with c-BN films acting as the insulator layer which enabled electrical characterization (current-voltage (I-V) measurements) of electronic properties of producet layers.

The results of a parametric study of the current-voltage characteristics and resistivity of material of such structures are investigated.

The results of the experimental work has enabled a preliminary analysis of the conduction mechanisms in structures consisting of c-BN based thick film layers between metal electrodes at room temperature.

[Pro5] **Microwave reasonable cells with anisotropic properties of liquid crystals,** (Mikrofalowe przestrajalne rezonatory wykorzystujące właściwości anizotropowe ciekłych kryształów), project leader: Janusz Parka, July 2006 – December 2006

Liquid crystals have very interesting properties in microwave frequency range. Measurements of the parallel and perpendicular components of permittivity tensor were developed. The dielectric loss tangents in nematic liquid crystal material was described and appointed. Anisotropic properties of dielectric anisotropy give possibility to construct different tunable microwave devices.

[Pro6] **Miniaturised biochemical system with optical and electrochemical detection,** (Miniaturowy system biochemiczny z detekcją optyczną i elektrochemiczną), project leader: R.B. Beck, co-workers: L. Łukasiak, Z. Pióro, J. Walczak, J. Maciak, J. Gibki, W. Ciemiewski, K. Dalbiak, K. Krogulski, May 2006 – December 2006

The project aims in studying and fabricating of miniaturized biochemical systems that allow in-situ optical and electrochemical detection.

[Pro7] **Modeling of manufacturing defects of arbitrary shape in interconnections in deep submicron integrated circuits,** (Modelowanie defektów o dowolnym kształcie występujących w połączeniach w głęboko submikrometrowych układach scalonych), project leader: Wiesław Kuźmicz, July 2006 – December 2006

The topic of this work is development and implementation of methodology of modeling of manufacturing defects of arbitrary shape, as well as clusters of defects, in interconnection layers in DSM VLSI circuits. It will be investigated how such defects affect operation of the circuits and manufacturing yield. One of the questions to be answerd is: to what extent these defects affect existing yield models which are based on the concept of spot defect.

[Pro8] **Verification of the system of electrical characterization of MOS devices,** (Weryfikacja systemu charakteryzacji elektrycznej przyrządów MOS), project leader: L. Łukasiak, co-workers: A. Jakubowski, R.B.Beck, S. Szostak, Z. Pióro, October 2006 – December 2006

The main goal of the project was assessing the reliability of selected electrical methods of characterization when applied to modern MOS structures.

4.2. Projects Granted by the Ministry of Education and Science

[Pro9] **Analysis of high vacuum standard based on the global model** (Analiza właściwości wzorców wysokich próżni w oparciu o model globalny), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Piotr Szwemin, co-worker: Marek Niewiński, September 2005 – June 2006

This grant support preparation Niewinski's PhD thesis untitled: Analysis of high vacuum standard based on the global model.

[Pro10] **Analysis of modulation bandwidth in planar lasers with photonic band gap (**Analiza pasma modulacji w laserach planarnych z przerwą fotonową**),** Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Agnieszka Mossakowska-Wyszyńska, co-workers: Paweł Szczepański, Paweł Czuma, Stanisław Jonak, November 2003 – May 2006

In this project, we analyse modulation bandwidth and relaxation oscillations in planar waveguide lasers based on photonic crystal structure. In our theoretical model, we take into account the gain saturation effect, transverse and longitudinal field distribution. We consider laser structures with F-P, DBR and DFB cavities. That model allows to define

in easy way the influence of the real structure parameters such as photonic crystal geometry, waveguide geometry, losses as well as strength of feedback on the damping rate and the frequency of relaxation oscillations and 3dB modulation bandwidth. With the help of this model it is possible to defined optimal geometry of the laser structures having F-P and DFB cavities, which provides maximal modulation bandwidth for given pumping level (characterized by small signal gain).

[Pro11] **Charge pumping as a tool for characterization of electrophysical parameters of new-generation MIS devices** (Metoda pompowania ładunku jako narzędzie do charakteryzacji parametrów elektrofizycznych nowych generacji przyrządów typu MIS), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: L. Łukasiak, co-workers: A. Jakubowski, S. Szostak, R.B. Beck, B. Majkusiak, J. Walczak, Z. Pióro, J. Gibki, D. Tomaszewski, A. Zaręba, J. Maciak, A. Linkowski, May 2005 – May 2008.

The aim of this project is to adapt the charge pumping method for new-generation MIS devices (e.g. in the presence of strong coupling between front and back semiconductor-dielectric interfaces in SOI structures or in the presence of SiGe or strained Si layer in the MOS structure). The next step is to perform detailed characterization of these devices using this method to assess the quality of the dielectric-semiconductor interface which is very important, especially in view of new gate-stack materials.

[Pro12] **Coherence properties of light generated by photonic crystal lasers** (Zagadnienie koherencji promieniowania generowanego w laserach z ośrodkiem aktywnym w postaci kryształu fotonowego), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Paweł Szczepański, co-workers: Anna Tyszka-Zawadzka, Adam Rudziński, May 2005 – November 2007

The main aim if this grand is to develop the semi classical model of light generation in planar Fabry-Perot and DBR lasers having an active medium in the form of photonic crystal. This study takes into account modification of density of quantum states as well as the effect of non-orthogonality of laser modes. We use a stochastic approach based on Fokker-Planck equation. With the help of this model it is possible to investigate the influence of geometric parameters and local defects of photonic crystal on coherence of laser light. The analysis of spontaneous emission rate will take into consideration two cases: the first one when spontaneous emission is Markovian process and is described by Fermi's Golden rule, and the second one when spontaneous emission includes atom-field interaction (so called "memory" effect). Additionally, the study of the influence of localized defects on spontaneous emission rate is predicted.

[Pro13] **Diamond-like carbon films in optical waveguide sensing techniques** (Warstwy diamentopodobne w światłowodowej technice czujnikowej), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jan Szmidt, co-workers: M.Śmietana, J.Kalenik, P.Niedzielski, W.Ciemiewski, K.Dalbiak, M.Trzaskowska. November 2004 – August 2006

Carbon layers (NCD, DLC) demonstrate specific chemical and biochemical activity. In consequence they can find application as chemical sensitive films in fibre optic or optical waveguide sensing structures. During project realisation a technology of such optoelectronic structures fabrication will be worked out. The technology includes: NCD and DLC deposition onto specify substrates, selective etching of deposited films and coupling of a optical signal source (laser) and detector (photodiode) to the structure. Electro physical and functional properties of constructed structures will be also investigated.

[Pro14] **Electrically conductive adhesives for inner layer connections in printed circuit boards** (Kleje elektrycznie przewodzące do realizacji połączeń międzywarstwowych w płytkach drukowanych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Ryszard Kisiel, co-workers: Ryszard Biaduń, Krystyna Szylko, Jerzy Kalenik, Zbigniew Szczepański, October 2003 – January 2006

The main goal of the project is to elaborate the family of electrically conductive adhesives for preparing inner connections in double sided PCbs as well as PCB with micro via. Such composition will be based on epoxy resin with Ag fillers and other additives. The main idea of this work is to elaborate the materials which can replace the environmentally harmful process of hole electroplating in PCB production.

[Pro15] **Electronic detectors and chemical sensitive devices with diamond and diamon-like carbon (dlc) films, (**Elektroniczne detektory i przyrządy chemoczułe z warstwami diamentowymi i diamentopodobnymi**)**, Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jan Szmidt, September 2006 – September 2009

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

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

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

[Pro16] **Extremely shallow (<10nm) silicon implantation (e.g. with nitrogen) for gate stack formation of future generations of microelectronics and nanoelectronic devices** (Ekstremalnie płytko (<10 nm) implantowany (np. Azotem) krzem w konstruowaniu struktur bramkowych dla przyszłych generacji przyrządów mikroelektroniki i nanoelektroniki), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: R.B. Beck, co-workers: K.

Domański, G. Gawlik, A. Kudła, Z. Pióro, J. Gibki, S. Szostak, A. Werbowy, J. Walczak, A. Zaręba.
October 2003 – April 2006

This project aims at performing detailed studies on the effect of surface region modification by means of extremely shallow ion implantation from plasma on following formation of dielectric layers (gate stacks). The attempt will be made to gain control of these effects that finally would allow e.g. simultaneous formation of gate dielectric layer of different thickness.

[Pro17] **Integration of silicon-technology IC with a nuclear-radiation detector fabricated in a SOI substrate** (Integracja układu scalonego wykonanego w technologii krzemowej z detektorem promieniowania jądrowego wykonanego w podłożu płytki SOI), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: A. Jakubowski, co-workers: A. Kociubiński, K. Dalbiak, K. Krogulski, M. Trzaskowska, May 2005 – May 2006.

The aim of the project is to analyse the thermal budget of both processes and to select the appropriate detector type (p-n junction or Shottky-barrier junction)

[Pro18] **New possibilities of the UV generation in ion lasers in the noble gases and its mixtures** (Nowe możliwości generacji promieniowania UV w jonowych laserach pracujących na gazach szlachetnych i ich mieszaninach), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jerzy Kęsik, May 2005 – May 2008

Significant progress observed in last years in structure and technology of ion laser discharge tubes created new possibilities of the continuous and multi-pulse generation of the ultraviolet radiation. The main goal of this project is optimization of laser tube construction and laser working conditions (discharge current, gas pressure, axial magnetic field intensity) to obtain maximum output power in a UV range. The measurements of active medium parameters (unsaturated gain coefficient, saturation parameter) and optimum mirror transmissions will be also executed. The investigations will be performed in a pure noble gases (Ar, Kr, Ne) and its mixtures. The significant part of investigations is determination of multi-pulse (quasi-continuous) operation on laser output power.

[Pro19] **Plasma methods for passivation of silicon carbide devices** (Plazmowe metody pasywacji przyrządów wytwarzanych w węgliku krzemu), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: J. Szmidt, co-workers: M. Sochacki, P. Śniecikowski, A. Szczęsny, May 2005 – September 2006.

The project concerns, passivating (dielectric) layers for silicon carbide devices e.g. Schottky diodes, PIN diodes, field effect transistors. The layers were deposited with plasma CVD processes. An influence of the devices' surface passivation with Al_2O_3, AlN, SiO_2 etc. on their parameters in range of very high voltages (>1kV) and high temperatures (>100°C) is analysed.

[Pro20] **Polarization sensitive liquid crystal filter in the digital image processing system** (Spektralno – polaryzacyjny filtr ciekłokrystaliczny w systemie cyfrowego przetwarzania i analizy obrazu), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jerzy Woźnicki, co-workers: Andrzej Walczak, Edward Nowinowski-Kruszelnicki, Janusz Parka, Hanna Górkiewicz-Galwas, Marek Sutkowski, Piotr Garbat, Jerzy Domański; October 2004 – April 2007

The project is devoted to preparation and investigation of the new liquid crystal filter and its application in the digital image processing system. Analysed filter is polarization sensitive because of special – hybrid, planar, circular or planar-homeotropic - alignment of the liquid crystal layer placed between crossed polarizes. Properties of the filter depend on applied liquid crystal. It is analysed in detail. It will be shown that such filter while joined with digital acquisition of the scene provides new possibilities in the optical signal processing. Proper system for that task will be constructed.

[Pro21] **Semiclassical model of light generation in 2-dimensional active Photonic Crystals** (Półklasyczny model generacji promieniowania w laserze o ośrodku aktywnym na bazie dwuwymiarowego kryształu fotonowego), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Paweł Szczepański, co-worker: Paweł Czuma, May 2005 – November 2006

The project target is to create semi classical model of light generation in lasers, which active medium has the geometry of 2-dimensional Photonic Crystal (PC). Combination of above model with transfer matrix techniques allow us to analyze nonlinear small-signal gain coefficient of such laser in above threshold regime. We can also know the influence of 2-dimensional Photonic Crystal structure geometry on gain characteristics of such lasers. The effect of above analysis give us possibility to project lasers with strong gain enhancement for highly monochromatic light.

[Pro22] **Test vectors generation for digital CMOS integrated circuits based on statistical analysis of manufacturing defects** (Generacja wektorów testowych dla cyfrowych układów scalonych CMOS wykorzystująca statystyczną analizę defektów produkcyjnych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Witold Pleskacz, co-workers: Wiesław Kuźmicz, Andrzej Wielgus, Adam Wojtasik, Grzegorz Janczyk, Tomasz Borejko, Jerzy Gempel, Stanisław Jeszka, Andrzej Wałkanis, May 2003 – May 2006

It is well known that classical test generation methods cannot handle the actual behaviour of faulty digital circuits implemented as CMOS integrated circuits (IC). These methods allow to generate test vectors using logic-driven gate-level models to represent the circuit design and abstract fault models (e.g. the stuck-at fault model – SAF) to describe manufacturing defects causing IC failure. As a result the circuit layout, physical defects characteristics and the actual circuit behaviour are ignored. The main aim of the project is development of new methodology for probabilistic modelling of physical defects in CMOS gates and estimation of the effectiveness of test patterns for detecting physical defects. Quality of testing depends also on quality of test patterns generated for a circuit under test. Evaluation criteria for digital

circuits testing are fault coverage and test application time. Low efficiency of the classical stuck-at fault model in real defect coverage in CMOS logic has initiated the need of new test approaches. These approaches extend the CMOS standard cells characterisation methodology for voltage defect based testing and for I_{DDQ} testing. The proposed methodology will allow finding the types of faults which may occur in a real IC, to determine their probabilities, and to find the input test vectors that detect these faults. Additionally obtained information can be used for defect oriented fault simulation and test generation at higher levels of circuit abstraction.

[Pro23] **Thin film $BaTiO_3$ ceramics for metal-ferroelectric-semiconductor (MFS) structures** (Cienkowarstwowa ceramika $BaTiO_3$ dla struktur metal-ferroelektryk-półprzewodnik (MFS)), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Aleksander Werbowy, co-workers: J.Szmidt, W.Ciemiewski, K.Dalbiak, A. Olszyna, P. Niedzielski, P. Firek, M.Trzaskowska, May 2004 – May 2007

The main goal of the project is development of the fabrication method of ultra-fine grained, high-k and high-resistive thin film $BaTiO_3$ ceramics as well as investigation of its properties from the viewpoint of the material's applicability as a dielectric layer for electronic devices. The attempt will be made to develop the technology (proper semiconductor surface pre-treatment, $BaTiO_3$ selective etching, metal contacts forming) that would enable producing test electronic structures, like MFS capacitors and field-effect transistors (FETs) with discussed ceramics playing the role of ferroelectric gate insulator.

4.3. Projects Granted by International Institutions

[Pro24] **Controlling Leakage Power in NanoCMOS SoCs, European Commission 6 Framework Programme - Integrated Project CLEAN (FP6 – 4 – IST – 4 – 026980 – IP – CLEAN),** Projekt zintegrowany w ramach 6-tego Programu Ramowego UE, project leader: Wiesław Kuźmicz, November 2005 – October 2008

Today's greater than ever functionality of electronic devices is possible only by integrating an increasing number of highly complex tasks into the so called embedded systems on chip (SoC). According to "Moore's Law" the complexity of hardware systems doubles itself exponentially over time. This trend is still holding on, already enabling chips integrating one billion transistors. The required technology shrink - now below 65nm - rises the problem of dramatically increasing power consumption, especially in consequence of so called leakage currents.

CLEAN is a project, in which the problem of leakage currents in the upcoming technologies (65nm and below) is addressed. Main targets of the CLEAN project are:

- analysis and development of design techniques for leakage reduction,
- development of EDA tools for leakage aware design using the design techniques,
- development of EDA tools for high level leakage prediction, supporting leakage aware design.

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[Pro25] **Network of Excellence for Micro-Optics – NEMO, Network of Excellence within 2nd IST 6FP of UE** (Mikronowe i sub-mikronowe przyrządy dla fotoniki - NEMO), Sieć doskonałości w ramach 6-tego Programu Ramowego UE, project responsible person in IMiO: Paweł Szczepański, co-workers: Paweł Czuma, Piotr Firek, Marcin Kaczkan, Wojciech Kamiński, Mariusz Klimczak, Kamila Leśniewska-Matys, Michał Malinowski, Agnieszka Mossakowska-Wyszyńska, Robert Paszkiewicz, Ryszard Piramidowicz, Adam Rudziński, Jan Szmidt, Mateusz Śmietana, Paweł Śniecikowski, Anna Tyszka-Zawadzka, Piotr Warda, Aleksander Werbowy, Piotr Witoński, September 2004 – August 2008

NEMO is running since 1 September 2004 and aims at providing Europe with a complete Micro-Optics food-chain by setting up durable service and technology centres and long-term research centres. NEMO will be the networking platform of 30 European partners for the next 4 years and beyond. Each of the 30 institutes involved in NEMO is a key role player in micro-optics. NEMO's main objective is to structure and integrate the expertise and core-competences of its partners while strengthening their R&D activities in the emerging field of micro-optics.

The main types of activities in which the Institute of Microelectronics and Optoelectronics actively participates within this project are:

- Centre for Modelling and Design;
- Centre for Measurement and Instrumentation;
- Infra-Red Micro-Optics.

More information are at http://consortium.micro-optics.org/

[Pro26] **PV Enlargement – Technology Transfer, Demonstration and Scientific Exchange Action for the Establishment of a strong European PV Sector,** project leader: Stanislaw M. Pietruszko, SPUB-M, January 2003 – December 2006

Important issue of PV-Enlargement project is monitoring of installed PV façade. Meteorological and electrical parameters will be measured and performance of the PV system will be analysed. All the measured data and analysis results will be compared with data from other PV systems installed in the PV Enlargement project. Project complementary to the project granted by European Commission 5 Framework Programme on RTD (NNE5-2001-736).

21 kW PV system will be installed on the façade of Faculty of Microelectronics and Optoelectronics at Warsaw University of Technology. That will be the largest PV system (in Poland) and first PV façade in Poland. The PV laboratory will be established. It will be used for research work and education.

[Pro27] **PULLing the limits of NANOCmos electronics - PULLNANO, Integrated Project 6FP UE**, project leader: Bogdan Majkusiak, co-worker: J. Walczak, A. Mazurak, June 2006 – November 2008

PULLNANO is a very powerful integrated project focussed on the advanced research and technology activites necessary to push forward limits of CMOS technologies. It focuses on RTD activities necessary to develop the 32nm and 22nm technoliges node and open the way to the long term future of CMOS based technologies. To help to achieve this objective, PULLNANO gathers the best competences existing in Europe: IC manufactureres, technological research institutes, equipment suppliers, and a large number of academic teams. The Warsaw team is engaged in quantum-mechanics based simulation of devices that contribute to prediction of CMOS limits, design of device and architecture solutions beyond traditional planar CMOS.

[Pro28] **Silicon-based Nanodevices – SINANO, Network of Excellence within IST 6FP of UE** (Przyrządy naonelektroniki oparte na krzemie – SINANO), Sieć doskonałości w ramach 6-tego Programu Ramowego UE, project leader: Romuald B.Beck, co-workers: B.Majkusiak, L.Łukasiak, K.Dalbiak, W.Ciemiewski, T.Bieniek, R.Mroczyński, D.Tomaszewski, J.Grabowski, G. Głuszko, January 2004 – December 2006

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

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

[Pro29] **Thematic Network on Silicon on Insulator Technology, Devices and Circuits - Coordination Action EUROSOI,** project leader: Bogdan Majkusiak, co-worker: J. Walczak, December 2003 – March 2006

The aim of the project is to integrate the European research community in the topic of silicon-on-insulator technology.

4.4. Other Projects

[Pro30] **Elaboration of upconversion fiber laser for visible wavelengths** (Opracowanie i wykonanie modułu lasera włóknowego na zakres widzialny z konwersją wzbudzenia), project leader: Michał Malinowski, July 2004 – June 2007

Diode pumped Pr^{3+} activated visible fibre laser is investigated. Single spatial mode laser diode is used as a pump source in double doped Pr^{3+}+Yb^{3+}:ZBLAN up conversion fibre laser. Lasing by up conversion means applying two infra red photons to a medium that responds by emitting one photon in the visible. Theoretical analysis and modelling of energy transfer processes in Pr/Yb double doped fibre lasers are performed. Experimental work is oriented on the construction and investigation of fibre lasers based on Pr/Yb:ZBLAN glass.

[Pro31] **Study of technology and construction as well as realization of micro mechanical switch** (Opracowanie technologii i konstrukcji oraz wykonanie przełącznika mikromechanicznego), project leader: Jerzy Kruszewski, co-workers: Michał Borecki, Maria Bebłowska, Paweł Wrzosek, Ryszard Biaduń, July 2004 – June 2007

Work relates micro - optical switches. Proposed switch consists from head and optical fibres. The components of switch were mathematical modelling in aim of study of construction. The actuator is the key component of switch head. The construction of electromagnetic actuator with magnetic latch of show on exceptional usefulness under conducted analysis.

[Pro32] **The sensor module study and realization for measurement of vibration** (Opracowanie i wykonanie modułu czujnika do pomiaru wibracji), project leader: Jerzy Kruszewski, co-workers: Michał Borecki, Maria Bebłowska, Paweł Wrzosek, Ryszard Biaduń, July 2004 – June 2007

The work concerns the micro mechanical optical sensor of vibration. The sensor module consists from the following optoelectronic components: head, fibres track, supply and detection scheme. Optical track is open in the head for sensing purposes. The modulation of optical radiation happens in this place through a micro mechanical component. The method of optical and mechanical parameters characterization for the head was worked out.

5. DEGREES AWARDED

5.1. Ph.D. Degrees

[PhD1] Wojciech Kamiński, **Design, technology and parameters of argon ion laser discharge tube with discharge capillary made of silicone carbide**, Konstrukcja, technologia i parametry rury wyładowczej jonowego lasera argonowego z kapilarą wyładowczą wykonaną z węglika krzemu, supervisor: Paweł Szczepański, 24 October 2006

[PhD2] Dominik Kasprowicz, **Modeling of clock skew in CMOS integrated circuits in the presence of manufacturing variability**, Modelowanie rozproszenia sygnału zegara (clock skew) w układach scalonych CMOS z uwzględnieniem wpływu rozrzutów produkcyjnych, supervisor: Andrzej Pfitzner, 12 December 2006

[PhD3] Andrzej Kociubiński, **Integration of silicon-technology IC with a nuclear-radiation detector fabricated in a SOI**, Integracja układu scalonego wykonanego w technologii krzemowej z detektorem promieniowania jądrowego wykonanego na podłożu płytki SOI (Silicon-On-Insulator), supervisor: Andrzej Jakubowski, 19 December 2006

[PhD4] Marek Niewiński, **Analysis of the properties of the high vacuum standards based on the global model**, Analiza właściwości wzorców wysokich próżni w oparciu o model globalny, supervisor: Piotr Szwemin, 14 November 2006

[PhD5] Robert Paszkiewicz, **Semiclassical theory of light generation in distributed feedback DBR/DFB lasers with circular gratings**, Półklasyczny model generacji promieniowania w laserze z rozłożonym sprzężeniem zwrotnym DBR/DFB z siatką o symetrii cylindrycznej z uwzględnieniem przestrzennego rozkładu pola, supervisor: Paweł Szczepański, 19 September 2006

[PhD6] Marcin Sadowski, **Fast static difital gates with reduced power consumption**, Szybkie statyczne bramki cyfrowe o małym poborze mocy, supervisor: Wiesław Kuźmicz, 7 November 2006

5.2. M.Sc. Degrees

[MSc1] Ahmed Ahtaiba, **The DWDWM link,** advisor: Bogdan Galwas, fairly good

[MSc2] Michał Arciszewski, **Ekstrakcja planarnych indukcyjności spiralnych i pasożytniczych z topografii układu scalonego,** advisor: Elżbieta Piwowarska, good

[MSc3] Marek Cieślik, **Warunki wzbudzania generacji promieniowania z zakresu widzialnego i UV we włóknach ZBLAN aktywowanych jonami holmu,** advisor: Ryszard Piramidowicz, good

[MSc4] Grzegorz Dorosz, **Optymalizacja toru sygnałowego w analizatorze widma,** advisor: Jerzy Skulski, good

[MSc5] Mariusz Dudkowski, **Światłowodowy przełącznik elektromagnetyczny,** advisor: Maria Bebłowska, good

[MSc6] Krzysztof Giętkowski, **Cyfrowe realizacje systemów rozmytych opisanych macierzami FAM,** advisor: Andrzej Wielgus, very good

[MSc7] Jarosław Grabowski, **Kinetyka utleniania krzemu naprężonego krzemogermanem,** advisor: Romuald Beck, excellent

[MSc8] Jakub Jasiński, **Dydaktyczne laboratorium techniki mikroprocesorowej,** advisor: Zbigniew Pióro, very good

[MSc9] Iwona Jaworska, **Analiza generacji promieniowania w laserze DBR wykonanym z jednowymiarowego kryształu fotonowego,** advisor: Agnieszka Mossakowska-Wyszyńska, excellent

[MSc10] Łukasz Józwik, **Projekt regulatora LDO o małym poborze mocy w technologii CMOS 0.35µm,** advisor: Zbigniew Jaworski, good

[MSc11] Mariusz Kaczmarczyk, **Zbadanie wpływu krystalizacji struktur AlGaAs/GaAs na parametry lasera półprzewodnikowego,** advisor: Agata Jasik, very good

[MSc12] Mateusz Kawałkiewicz, **Aplication of the phased array antenna in the RF-ID system,** advisor: Jarosław Dawidczyk, very good

[MSc13] Konrad Kiełbasiński, **Badanie stabilności bezołowiowych połączeń lutowania,** advisor: Jerzy Kalenik, excellent

[MSc14] Marcin Koba, **Analiza pracy wielomodowej w laserach posiadających ośrodek aktywny w postaci kryształu fotonowego,** advisor: Paweł Szczepański, excellent

[MSc15] Paweł Kuć, **Implementacja inteligentnego przetwornika A/C w technologii CMOS,** advisor: Zbigniew Jaworski, very good

[MSc16] Grzegorz Lewandowski, **Mikroanalizator krwi,** advisor: Zbigniew Pióro, good

[MSc17] Krzysztof Madziar, **Optoelektroniczne metody kontroli kąta odchylenia wiązki w fazowanych szykach antenowych,** advisor: Jarosław Dawidczyk, very good

[MSc18] Andrzej Makarewicz, **System wizualizacji pola elektromagnetycznego w falowodach prostokątnych,** advisor: Piotr Witoński, very good

[MSc19] Marcin Maraszkiewicz, **Badanie elektrooptycznych i optycznych charakterystyk złącza polimer - ciekły kryształ,** advisor: Janusz Parka, good

[MSc20] Andrzej Mazurak, **Stosowanie kaart akwizycyjnych do laboratoryjnych badań elementów elektronicznych,** advisor: Zdzisław Mączeński, very good

[MSc21] Magdalena Michalska, **Problem transmisji sygnałów światłowodach telekomunikacyjnych,** advisor: Agnieszka Szymańska, very good

[MSc22] Tomasz Olszewski, **Opracowanie układu światłowodowego czujnika obecności wody,** advisor: Jerzy Kalenik, very good

[MSc23] Zbigniew Organa, **Analiza dynamicznej pracy lasera DBR wykonanego z jednowymiarowego kryształu fotonowego,** advisor: Agnieszka Mossakowska-Wyszyńska, excellent

[MSc24] Marcin Pawlak, **Analiza pracy systemu fotowoltaicznego dołączonego do sieci (z modułami z krzemu monokrystalicznego),** advisor: Stanisław Pietruszko, good

[MSc25] Zbigniew Piątek, **Ocena jakości zabezpieczeń układów scalonych przed skutkami wyładowań elektrostatycznych z wykorzystaniem metody pomiarowej TLP,** advisor: Witold Pleskacz, excellent

[MSc26] Krzysztof Pierzchała, **Światłowodowy czujnik obciążenia,** advisor: Maria Bebłowska, very good

[MSc27] Piotr Pływaczewski, **Opracowanie algorytmów pomiarowych charakterystyk CV i ich praktyczna realizacja,** advisor: Jan Gibki, good

[MSc28] Michał Rakowski, **Szybki ekstraktor obszarów krytycznych na zwarcia w dużych układach VLSI,** advisor: Witold Pleskacz, excellent

[MSc29] Jakub Siudy, **Zagadnienie generacji promieniowania w falowodowym laserze dwukanałowym wykonanym w strukturze dwuwymiarowego kryształu fotonicznego,** advisor: Paweł Szczepański, excellent

[MSc30] Grzegorz Szudrowski, **Badanie właściwości użytkowych połączeń międzywarstwowych wykonywanych klejami,** advisor: Ryszard Kisiel, very good

[MSc31] Arkadiusz Tomaszewicz, **Interaktywny symulator złącza p-n dostępny poprzez sieć WWW,** advisor: Sławomir Szostak, very good

[MSc32] Piotr Trochimiuk, **Opracowanie i implementacja oprogramowania środowiska pomiarowego dla edukacyjnego układu scalonego DefSim2,** advisor: Witold Pleskacz, very good

[MSc33] Piotr Wawrzyniak, **Badanie mechanizmów degradacji diod laserowych GaAsP/AlGaAs/GaAs; oraz opracowanie metod wstępnej selekcji przyrządów rokujących długie życie,** advisor: Jan Szmidt, very good

[MSc34] Paweł Wojtyra, **Fotoniczne filtry mikrofalowe - analiza i symulacja warunków pracy,** advisor: Bogdan Galwas, excellent

[MSc35] Paweł Wyszyński, **Analiza pracy systemu fotowoltaicznego wykonanego z cienkowarstwowych modułów z krzemu amorficznego,** advisor: Stanisław Pietruszko, very good

[MSc36] Karol Zieliński, **Projekt i realizacja wirtualnego laboratorium do charakteryzacji materiałów optycznych,** advisor: Ryszard Piramidowicz, good

[MSc37] Krzysztof Ziemnicki, **Modelowanie i analiza rozkładu widma promieniowania słonecznego i jego wpływ na działanie ogniwa fotowoltaicznego,** Stanisław Pietruszko, very good

[MSc38] Wojciech Żurawski, **Badanie właściwości emisyjnych szkieł fluorocyrkonowych domieszkowanych jonami dysprozu,** advisor: Ryszard Piramidowicz, very good

5.3. B.Sc. Degrees

[BSc1] Krzysztof Anders, **Oprogramowanie laboratoryjnego stanowiska do pomiarów statycznych charakterystyk tranzystorów MOS,** advisor: Jan Gibki, very good

[BSc2] Krzysztof Andryjowicz, **Wizualizacja propagacji pola elektromagnetycznego w falowodach cylindrycznych za pomocą narzędzi środowiska JAVA,** advisor: Piotr Witoński, good

[BSc3] Łukasz Bamburski, **Symulacja układów cyfrowych z wykorzystaniem System C,** advisor: Elżbieta Piwowarska, good

[BSc4] Piotr Bejm, **Projekt komparatora napięcia CMOS o bardzo niskim poborze prądu,** advisor: Wiesław Kuźmicz, good

[BSc5] Sławomir Czekański, **Menadżer zadań w systemie UNIX dla serwera programów CAD,** advisor: Adam Wojtasik, fairly good

[BSc6] Marcin Dąbrowski, **Badanie właściwości statycznych i dynamicznych przetworników ciekłokrystalicznych typu TN,** advisor: Janusz Parka, fairly good

[BSc7] Alina Demianiuk, **Baza danych dla identyfikacji centrów defektowych w warstwach epitaksjalnych GAN,** advisor: Antoni Siennicki, good

[BSc8] Tomasz Dorau, **Detektor sygnału radaru morskiego pasma S,** advisor: Jarosław Dawidczyk, excellent

[BSc9] Marcin Filutko, **Opracowanie i badanie światłowodowego czujnika odchylenia,** advisor: Maria Bebłowska, good

[BSc10] Oliwia Gąbka, **Baza wiedzy do identyfikacji centów defektowych w półizolującym GaAs,** advisor: Antoni Siennicki, good

[BSc11] Konrad Gurtat, **Pomiar kształtu wiązki elektronów wyrzutni akceleratora medycznego,** advisor: Ryszard Kisiel, good

[BSc12] Łukasz Jałowiecki, **Badanie elektrooptycznych właściwości cienkich przetworników ciekłokrystalicznych,** advisor: Janusz Parka, good

[BSc13] Paweł Janowski, **Pomiar dyspersji w światlowodach polimerowych,** advisor: Michał Borecki, good

[BSc14] Krzysztof Kapel, **Bezpieczeństwo transmisji danych w komputerowych sieciach radiowych,** advisor: Agnieszka Szymańska, very good

[BSc15] Tomasz Klonowski, **Czujnik odkształtowany oparty na przestrzennej strukturze krzemowej,** advisor: Zbigniew Szczepański, good

[BSc16] Marcin Kruczyk, **System alarmowania oparty na łączu GSM,** advisor: Mikołaj Baszun, very good

[BSc17] Tomasz Mężyński, **Badanie intensywności przejść optycznych w dielektrycznych w ośrodkach laserowych domieszkowanych jonami Pr^{3+} w oparciu o teorię Judda – Ofelta,** advisor: Michał Malinowski, good

[BSc18] Piotr Michalski, **Badanie sprawności włókna optycznego ze źródłem światła,** advisor: Maria Bebłowska, good

[BSc19] Łukasz Ozimkiewicz, **Warunki projektowania i pracy łączy światłowodowych w sieciach CATV,** advisor: Agnieszka Szymańska, fairly good

[BSc20] Karolina Paciorek, **Symulacja numeryczna pracy progowej lasera Fabry-Perota z ośrodkiem aktywnym w postaci jednowymiarowego kryształu fotonicznego,** advisor: Anna Tyszka-Zawadzka, fairly good

[BSc21] Mariusz Przybysz, **Odbiornik optyczny o regulowanym wzmocnieniu,** advisor: Bogdan Galwas, good

[BSc22] Paweł Przychodzeń, **Wpływ narażeń klimatycznych na otwory przelotowe wypełnione różnymi typami klejów elektrycznie przewodzących,** advisor: Ryszard Kisiel, good

[BSc23] Tomasz Rogalski, **Badanie stabilności rezystancji przelotek wykonanych klejami elektrycznie przewodzącymi w płytkach drukowanych (PCB),** advisor: Ryszard Kisiel, good

[BSc24] Paweł Rojek, **Badanie i analiza właściwości generacyjnych kryształu BYF:Pr^{3+},** advisor: Michał Malinowski, good

[BSc25] Marcin Rudnicki, **Układ elektroniczny światłowodowego czujnika poziomu paliwa,** advisor: Jerzy Kalenik, good

[BSc26] Piotr Szczurowski, **Łącze radiowo-światłowodowe: projekt anteny odbiorczej sprzężonej nadajnikiem optycznym,** advisor: Jerzy Skulski, good

[BSc27] Leszek Tragarz, **Pomiar przewodności cieplnej klejów elektrycznie przewodzących,** advisor: Ryszard Kisiel, good

[BSc28] Maciej Urban, **Układ do badania charakterystyk przetworników ciekłokrystalicznych wykorzystujących interfejs GPIB,** advisor: Janusz Parka, good

[BSc29] Łukasz Usydus, **Przestrajany odbiornik optyczny z dwubramkowym tranzystorem FET,** advisor: Bogdan Galwas, very good

[BSc30] Tomasz Wiśniewski, **Centrala do sterowania czujnikami zarządzana poprzez Internet,** advisor: Sławomir Szostak, good

[BSc31] Maciej Witkowski,**Projekt topografii układu odczytu danych z detektora promieniowania,** advisor: Elżbieta Piwowarska, good

[BSc32] Maciej Wojtowicz, **Projekt bloków analogowych mikronadajnika RF,** advisor: Elżbieta Piwowarska, good

[BSc33] Robert Wojtyra, **Symulacja charakterystyk elektrycznych sytruktur MOS nowej generacji,** advisor: Lidia Łukasiak, fairly good

[BSc34] Michał Zaremba, **Lokalowa sieć światłowodowa do transmisji danych,** advisor: Jerzy Piotrowski, good

[BSc35] Krzysztof Adżarski, **Badanie właściwości temperaturowych cienkich przetworników ciekłokrystalicznych,** advisor: Janusz Parka, good

6. PUBLICATIONS

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

Number	Journal	Authors	Title	Volume	Pages
[Pub1]	Applied Physics Letters	S.Kobyakov, A.Kamińska, A.Suchocki, D.Galanciak, M.Malinowski	Nd^{3+}-doped yttrium aluminum garnet crystal as a near-infrared pressure sensor for diamond anvil cells	88(23)	234102-1-2
[Pub2]	Chemistry of Materials	D.A.Pawlak, K.Kolodziejak, S.Turczynski, J.Kisielewski, K.Rozniatowski, R.Diduszko, M.Kaczkan, M.Malinowski	Self-organized, rodlike, micrometer-scale microstructure of $Tb_3Sc_2Al_3O_{12}$-$TbScO_3$:Pr eutectic	18(9)	2450-2457
[Pub3]	Cryogenics	M.V.Jacob, J.G.Hartnett, J.Mazierska, J.Krupka, M.E.Tobar	Dielectric characterisation of Barium Fluoride at cryogenic temperatures using TE_{011} and quasi TE_{0mn} mode dielectric resonators	46	730-735
[Pub4]	Ferroelectrics	J.Krupka, Wei-te Huang, Mean-Jue Tung	Complex permittivity measurements of thin ferroelectric films employing split post dielectric resonator	335	89-94
[Pub5]	IEEE Transactions on Electron Devices	A.Zaręba, L.Łukasiak, A.Jakubowski	The influence od selected material and transport parameters on the accuracy of modeling early voltage in SiGe-Base HBT	vol. 53, No 8	1946-1948
[Pub6]	IEEE Transactions on Microwave Theory and Techniques	J.Krupka, A.Abramowicz, K.Derzakowski	Magnetically tunable filters for cellular communication terminals	vol. 5, No 6	2329-2335
[Pub7]	IEEE Transactions on Microwave Theory and Techniques	J.Krupka, J.Breeze, A.Centento, N.Alford, T.Claussen, L.Jensen	Measurements of permittivity, dielectric loss tangent, and resistivity of float-zone silicon at microwave frequencies	vol. 54, No 11	3995-4001
[Pub8]	IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control	J.G.Hartnett, M.E.Tobar, E.N.Ivanov, J.Krupka	Room temperature measurement of the anisotropis loss tangent of sapphire using the whispering gallery mode technique	vol. 53, No 1	34-38
[Pub9]	IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control	J.Krupka, T.Zychowicz, V.Bovtun, S.Veljko	Complex permittivity measuremnts of ferroelectrics employing composite dielectric resonator technique	vol. 53 No 10	1883-1888
[Pub10]	Journal of Computational Electronics	B.Majkusiak, J.Walczak	Simulation of the gate tunnel current in the double gate (DG) MOS transistor	5	143-148
[Pub11]	Journal of Phase Equilibria and Diffusion	Z.Moser, W.Gąsior, K..Bukat, J.Pstruś, R.Kisiel, J.Sitek, K.Ishida, I.Ohnuma	Pb-Free Solders: Part 1. Wettability Testing of Sn-Ag-Cu Alloys with Bi Additions	vol. 27, No 2	133-139
[Pub12]	Journal of Phase Equilibria and Diffusion	I. Ohnuma, K.Ishida, Z.Moser, W.Gąsior, K.Bukat, J.Pstruś, R.Kisiel, J.Sitek	Pb-Free Solders: Part II. Application of ADAMIS Database in Modeling of Sn-Ag-Cu Alloys with Bi Additions	vol. 27, No 3	245-254
[Pub13]	Journal of Physics Condensed Matter	W.Gryk, C.Dujardin, M.-F. Joubert, W.Ryba-Romanowski, M.Malinowski, M.Grinberg	Pressure effect on luminescence dynamics in Pr^{3+}-doped $LiNbO_3$ and $LiTaO_3$ crystals	18(1)	117-125
[Pub14]	Journal of the European Ceramic Society	T.Zychowicz, J.Krupka, M.E.Tobar	Whispering gallery modes in hollow spherical dielectric resonators	26	2193-2194
[Pub15]	Materials Science and Enginering A	M.V.Jacob, J.Krupka, J.Mazierska, G.S.Woods	Cryogenic complex anisotropic permittivity of magnesium fluoride	427	175-180

1 Institute for Scientific Information (Philadelphia, USA)

[Pub16]	Measurement Science and Technology	J.Krupka	Frequency domain complex permitivity measurements at microwave frequencies	17	R55-R70
[Pub17]	Opto-Electronics Review	M.Sutkowski, T.Grudniewski, R.Żmijan, J.Parka, E.Nowinowski-Kruszelnicki	Optical data storage in LC cells	14 (4)	103-105
[Pub18]	Optical Materials	R.Piramidowicz, P.Witoński, M.Klimczak, M.Malinowski	Analysis of up-converted UV fluorescence dynamics in Nd^{3+} doped ZBLAN glasses	28	152-156
[Pub19]	Optical Materials	Cz.Koepke, K.Wisniewski, D.Dyl, M.Grinberg, M.Malinowski	Evidence for existence of the trapped exciton states in Pr^{3+}-doped $LiNbO_3$ crystal	28(1-2)	137-142
[Pub20]	Optical Materials	M.Kaczkan, M.Malinowski	Inhomogeneity of Ho^{3+} activated $SrLaGa_3O_7$ and $SrLaGaO_4$ crystals studied by fluorescence line narrowing technique	28 (1-2)	119-122
[Pub21]	Physics Status Solidi (a)	M.Ćwil, P.Konarski, T.Bieniek, R.B.Beck	Si-oxide/Si and Si-oxynitride/Si interfaces analysed	No 9	220-2204

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

Number	Journal	Authors	Title	Volume	Pages
[Pub22]	Elektronika	L. Łukasiak, A.Jakubowski, R.B.Beck, Z.Pióro	Krzemogerman SiGe w mikro-elektronice	4	34-37
[Pub23]	Elektronika	J.Szmidt	Węglik krzemu I jego zastosowania w elektronice wielkich częstotliwości, dużych mocy i wysokich temperatur – projekt konkursowy, geneza, założenia i przewidywane efekty.	9	5 - 10
[Pub24]	Forum Akademickie	J.Woźnicki	Instrument projakościowy	5	43
[Pub25]	Inżynieria Biomateriałów	P.Firek, R.Mroczyński, J.Szmidt, R.Beck, A.Werbowy	Modifying electrophysical properties of Si-CBN interface by introduction of ultrathin dielectric layer	56-57	27-29

6.3. Scientific and Technical Papers Published in Conference Proceedings

Number	Conference	Authors	Title	City, Country	Volume	Pages
[Pub26]	2nd Workshop EURSOI'2006, 8-10 March	B.Majkusiak	Steady-State in the double gate MOS resonant tunneling diode	Grenoble, France		1-2
[Pub27]	6th International Conference on f-elements ICFE6, 4-9 September	S.Kobyakov, D.Galanciak, A.Kamińska, A.Suchocki, M.Malinowski	YAG:Nd^{3+} – a new pressure sensor for diamond anvil cells	Wrocław, Poland		30
[Pub28]	6th International Conference on f-elements ICFE6, 4-9 September	M.Nakielska, J.Sarnecki, M.Malinowski, R.Piramidowicz	Up-conversion and fluorescencje quenching processes studies in highly Pr^{3+} doped YAG waveguides	Wrocław, Poland		53
[Pub29]	6th International Conference on f-elements ICFE6, 4-9 September	R.Piramidowicz, M.Kaczkan, M.Klimczak, M.Kowalska, M.Malinowski	UV fluorescence analysis in Ho3+ZBLAN glasses	Wrocław, Poland		67
[Pub30]	6th International Workshop on Microelectronics Education	A.Jutman, W.Pleskacz, N.Boiko, R.Ubar	DefSim – Based exercises for studing defects in CMOS gates	Stocholm, Sweden		23-26

[Pub31]	7th IEEE Latin-American Test Workshop – LATW'2006, 24 March – 3 April	W.A. Pleskacz, T.Borejko, A.Wałkanis, V.Stopjakova, A.Jutman, R.Ubar	DefSim: CMOS Defects on Chip for Research and Education	Buenos Aires, Argentyna		74-79
[Pub32]	8 STL – Sympozjum Techniki Laserowej - 25-29 September	M.Klimczak, P.Witoński, M.Malinowski, R.Piramidowicz	Analiza warunków pracy laserów włóknowych z konwersją wzbudzenia aktywowanych jonami Pr^{3+}	Szczecin – Świnoujście, Polnad		69-71
[Pub33]	8 STL – Sympozjum Techniki Laserowej - 25-29 September	P.Witoński, M.Malinowski, R.Piramidowicz	Modelowanie parametrów generacji laserów paskowych Nd:YAG/YAG	Szczecin – Świnoujście, Polnad		83 - 86
[Pub34]	8 STL – Sympozjum Techniki Laserowej - 25-29 September	J.Kęsik, W.Kamiński, M.Osiniak	Metoda zmiany cisnienia gazu aktywnego w rurze wyładowczej lasera jonowego	Szczecin – Świnoujście, Polnad		19-22
[Pub35]	8 STL – Sympozjum Techniki Laserowej - 25-29 September	J.Kęsik, W.Kamiński, M.Osiniak, J.Lipkowski, P.Warda	Jonowy laser argonowo-kryptonowy w warunkach pracy wieloimpulsowej	Szczecin – Świnoujście, Polnad		33-38
[Pub36]	8 STL – Sympozjum Techniki Laserowej - 25-29 September	J.Kęsik, M.Osiniak	Pomiary parametrów ośrodka aktywnego lasera jonowego w zakresie promieniowania UV	Szczecin – Świnoujście, Polnad		101-106
[Pub37]	8 STL – Sympozjum Techniki Laserowej - 25-29 September	M.Kaczkan, M.Borowska, K.Kołodziejak, T.Łukasiewicz, MMalinowski	Konwersja promieniowania podczerwonego na zakres widzialny w krysztale $Yb_3Al_5O_{12}:Er^{3+}$	Szczecin – Świnoujście, Polnad		95-98
[Pub38]	8 STL – Sympozjum Techniki Laserowej - 25-29 September	P.Szczepański, A.Mossakowska-Wyszyńska, A.Tyszka-Zawadzka	Light generation in photonic crystal lasers	Szczecin – Świnoujście, Polnad		29-40
[Pub39]	8 STL – Sympozjum Techniki Laserowej - 25-29 September	P.Czuma, P.Szczepański	Analysis of light generation in 2D photonic crystal laser – semiclassical approach	Szczecin – Świnoujście, Polnad		91-94
[Pub40]	8 STL – Sympozjum Techniki Laserowej - 25-29 September	M.Malinowski, R.Piramidowicz, W.Woliński	Światłowodowe źródła promieniowania widzialnego	Szczecin – Świnoujście, Polnad		
[Pub41]	8 STL – Sympozjum Techniki Laserowej - 25-29 September	M.Nakielska, A.Wnuk, J. Sarnecki, M.Malinowski, R.Piramidowicz	Badania emisji w zakresie widzialnym warstw falowo-dowych Pr^{3+}:YAG/YAG sen-sybilizowanych jonami Yb^{3+}	Szczecin – Świnoujście, Polnad		15-18
[Pub42]	11th Internationa Workshop on Computational Electronics, 25-27 May	B.Majkusiak	Modeling the inelastic scattering effect on the resonant tunneling current	Vienna, Austria		271-272
[Pub43]	16th International Travelling Summer School on Microwaves and Lightwaves, 8-14 July	M.Malinowski	Fiber amplifiers and lasers	Warszawa, Poland		1-23
[Pub44]	25th International Conference on Microelectronics MIEL'2006, 14-17 May	T.Borejko, A.Jutman, W.A.Pleskacz, R.Ubar	DefSim: measurement environmentfor CMOS defects	Bergrade, Serbia and Montenegro	2	679-682
[Pub45]	28th International Conference on Physics of Semiconductors, 24-28 July	M.Sakowicz, J.Łusakowski, K.Karpierz, M.Grynberg, B.Majkusiak, T.Tauk, A.Tiberj, W.Knap, Z.Bougrioua, M.Azize, P.Lorenzini, F.Boeuf, T.Skotnicki	Electron mobility and concentration on submicro-meter scale – investigation of Si and AlGaN/GaN field effect transistors by AC magnetoresistance method	Vienna, Austria		1-2

[Pub46]	45th European ICT Congress, 30 August - 2 September	P.Szczepański	Development of micro- and nanophotonics – impact on information technology	Athens, Greece		284-286
[Pub47]	Dylematy studiów dwustopniowych- XXI ogólnopolska konferencja, 16-17 June	J.Woźnicki	Studia trójstopniowe – europejski i polski wybór	Łódź, Poland		21-26
[Pub48]	EMPS'2006 4th European Micro-electronics and Packaging Symposium, 22-24 May	R.Kisiel, J.Felba, J.Borecki, A.Mościcki	Stability properties of PCB microvias fillings made by conductive adhesives	Terme Četež, Slovenia		333-338
[Pub49]	EMPS'2006 4th European Micro-electronics and Packaging Symposium, 22-24 May	R.Kisiel, P.Syryczyk	Optimization of reflow soldering process for SnAgCu solder paste	Terme Četež, Slovenia		295-299
[Pub50]	EOS Topical Meeting on Nanophotonics, Metamaterials and Optical Microcavities 16-19 October	A.Tyszka-Zawadzka, M.Koba, A.Rudziński, P.Szczepański	Statistical properties of light generated by photonic crystal laser	Paris, France	3	243-244
[Pub51]	EWDTW'06 Proceedings of IEEE East-West Design & Test Workshop, 15-19 September	D.Kasprowicz	Analytical model of clock skew in buffered H-trees	Sochi, Russia		301-304
[Pub52]	International Conference – Vacuum and Plasma Surface Engineering, 26-27 October	P.Firek, A.Werbowy, J.Szmidt, A.Olszyna	Boron nitride thin films produced by means of plasma methods	Liberec-Hejnice, Czech Rep.		11
[Pub53]	International Conference – Vacuum and Plasma Surface Engineering, 26-27 October	R.Gronau, D.Jarzyńska, E.Staryga, J.Szmidt	Electron field emission from diamond-like carbon films	Liberec-Hejnice, Czech Rep.		18-19
[Pub54]	International Conference – Vacuum and Plasma Surface Engineering, 26-27 October	N.Kwietniewski, P.Firek, A.Werbowy, W.Rzodkiewicz, A.Olszyna, J.Szmidt	Investigation of electro-physical properties of plasma produced thin $BaTiO_3$ films	Liberec-Hejnice, Czech Rep.		38
[Pub55]	International Conference – Vacuum and Plasma Surface Engineering, 26-27 October	A.Werbowy, N.Kwietniewski, P.Firek, J.Chojnowski, A.Olszyna, J.Szmidt	Plasma assisted synthesis, characterization and processing of thin $BaTiO_3$ films	Liberec-Hejnice, Czech Rep.		71
[Pub56]	International Conference – Vacuum and Plasma Surface Engineering, 26-27 October	M.Jakubowska, K.Kiełbasiński, J.Kalenik, R.Kisiel	Mechanical strength of lead-free solder joints in thick film hybrid circuits	Liberec-Hejnice, Czech Rep.		
[Pub57]	International Workshop on Advanced Spectroscopy and Optical Materials (IWASOM), 11-14 June	M. Kaczkan, M.Borowska, K.Kołodziejak, T.Łukasiewicz, M.Malinowski	Intensity of optical transitions of Er^{3+} in $Yb_3Al_5O_{12}:Er^{3+}$ crystal	Gdańsk, Poland		41
[Pub58]	International Workshop on Advanced Spectroscopy and Optical Materials (IWASOM), 11-14 June	R.Piramidowicz, M.Klimczak, M.Malinowski	Short-wavelength emission analysis in Dy:ZBLAN glasses	Gdańsk, Poland		42

[Pub59]	International Workshop on Advanced Spectroscopy and Optical Materials (IWASOM), 11-14 June	M.Nakielska, J.Kosko, J.Sarnecki, M.Malinowski, R.Piramidowicz	Fluorescence properties in the visible of highly Pr3+ doped YAG planar waveguides	Gdańsk, Poland		59
[Pub60]	International Workshop on Advanced Spectroscopy and Optical Materials (IWASOM), 11-14 June	S.Kobyakov, D.Galanciak, A.Kamińska, A.Suchocki, M.Malinowski	YAG:Nd^{3+} luminescence – a new pressure sensor for DAC	Gdańsk, Poland		43
[Pub61]	International Workshop on Advanced Spectroscopy and Optical Materials (IWASOM), 11-14 June	M.Malinowski, M.Nakielska, R.Piramidowicz, J.Sarnecki	Multi-ion interactions in rare-earth activated YAG epitaxial waveguides",referat zaproszony	Gdańsk, Poland		18
[Pub62]	ISPS'06 International Seminar on Power Semiconductors	Z.Lisik, J.Podgórski, J.Szmidt	SMIS – a novel structure of unipolar device	Prague, Czech Rep.		297-299
[Pub63]	Joint Meeting of the German Association for Crystal Growth (DGKK) and the Polish Association for Crystal Growth (PTWK), 6-8 March	K.Kołodziejak, D.Pawlak, R.Diduszko, M.Kaczkan, M.Borowska, T.Łukasiewicz	Single crystals and microstructures of $Yb_3Al_5O_{12}:Er^{3+}$	Berlin-Adlershof, Germany		
[Pub64]	Mixed Design of Integrated Circuits and Systems – MIXDES'2006, 22-24 June	Z.Piątek, W.Pleskacz, J.Kołodziejski	Transmission line pulsing tester for on-chip ESD protection testing	Gdynia, Poland		595-599
[Pub65]	Mixed Design of Integrated Circuits and Systems – MIXDES'2006, 22-24 June	A.Jarosz, A.Pfitzner	Interconnetion capacitances dependence on further neighbourhood in the bus – experimental verification of the model	Gdynia, Poland		480-485
[Pub66]	Mixed Design of Integrated Circuits and Systems – MIXDES'2006, 22-24 June	E.Piwowarska, A.Sidlarewicz	Analysis of spiral inductor model in CMOS circuit	Gdynia, Poland		454-459
[Pub67]	Mixed Design of Integrated Circuits and Systems – MIXDES'2006, 22-24 June	D.Kasprowicz	Empirical model of skew in clock-distribution grids	Gdynia, Poland		463-468
[Pub68]	MMA'2006 - Fourth International Conference on Microwave Materials and their Applications	S.Veljko, V.Bovtun, J.Krupka, S.Kamba	Microwave dielectric properties of bulk ferroelectric materials measured by composite dielectric resonator	Oulu, Finland		161
[Pub69]	MMA'2006 - Fourth International Conference on Microwave Materials and their Applications	M.E.Tobar, J.M. Le Floch, D.Cros, J.Krupka	General design technique for high Q-factor bragg reflector resonators	Oulu, Finland		23
[Pub70]	MMA'2006 - Fourth International Conference on Microwave Materials and their Applications	C.P.Yang, P.A.Smith, J.Krupka, T. Button	The losses of microwave ferrite materials at communication frequencies	Oulu, Finland		29

[Pub71]	MMA'2006 - Fourth International Conference on Microwave Materials and their Applications	J.Krupka, K.Derzakowski, T.Zychowicz, B.L.Givot, C.Egbert, M.M.David	Measurements of the surface resistance and conductivity of thin conductive films at frequencies near 1 GHz employing the dielectric resonator technique	Oulu, Finland		54
[Pub72]	MMA'2006 - Fourth International Conference on Microwave Materials and their Applications	J.Parka, J.Krupka, R.Dąbrowski, J.Wosik	measurements of anisotropic complex permittivity of nematic liquid crystals at microwave frequencies	Oulu, Finland		73
[Pub73]	Model awansu naukowego w Polsce, Conference Proc., 17-18 March	J.Woźnicki	Wstępne propozycje w sprawie nowych rozwiązań dotyczących kariery naukowej	Kraków, Poland		113-120
[Pub74]	Nanoscaled Semiconductor-on-Insulator Structures and Devices, NATO Advanced Research Workshop 15-19 October	B.Majkusiak	Resonance tunneling devices on SOI basis	Sudak, Crimea, Ukraine		75-76
[Pub75]	NEMO scientific network meeting, 9-10 February	A.Tyszka-Zawadzka, W.Kamiński, P.Warda	Binary grating, 1D and 2D, metallic and dielectric	Karlsruhe, Germany		16
[Pub76]	NEMO scientific network meeting, 9-10 February	P.Czuma, P.Szczepański	Photonic crystal fiber	Karlsruhe, Germany		18
[Pub77]	NEMO scientific network meeting, 9-10 February	A.Mossakowska-Wyszyńska, K.Leśniewska-Matys	Laser resonator with and without active medium	Karlsruhe, Germany		19
[Pub78]	NEMO scientific network meeting, 9-10 February	A.Mossakowska-Wyszyńska, P.Szczepański	Modulation bandwidth of SiO_2:Er two dimensional photonic crystals lasers with the help of the energy theorem	Karlsruhe, Germany		20
[Pub79]	NEMO scientific network meeting, 9-10 February	K.Leśniewska-Matys, P.Szczepański	Applicability of the energy theorem to photonic crystal waveguide laser	Karlsruhe, Germany		21
[Pub80]	NEMO scientific network meeting, 9-10 February	R.Paszkiewicz, A.Tyszka-Zawadzka, P.Szczepański	Multimode operation of circular grating-coupled surface emitting DBR/DFB laser	Karlsruhe, Germany		22
[Pub81]	NEMO scientific network meeting, 9-10 February	R.Piramidowicz, M.Klimczak	Round Robin Test on Material Characterization	Karlsruhe, Germany		
[Pub82]	NEMO scientific network meeting, 9-10 February	M.Klimczak, R.Piramidowicz	Short-wavelength luminescence properties of neodymium doped fluorozirconate glasses	Karlsruhe, Germany		
[Pub83]	Polska w Zjednoczonej Europie PAN	J.Woźnicki	Budowanie kapitału ludzkiego w Polsce i szanse młodych Polaków w Zjednocznoej Europie	Warszawa, Poland		27-44
[Pub84]	Proceedings of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments IV	K.M.Madziar, J.Dawidczyk	Modelling of the dispersion coefficient for the optical beamforming for phased array antennas	Wilga, Poland	6347	63471O-63471O-6

[Pub85]	Proceedings of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments IV	J.Dawidczyk	Modeling of a nonlinear PIN photodiode responsivity for frequency mixing of optically transmitted micro-wave signals	Wilga, Poland	6347	63471R -1 – 63471R -6
[Pub86]	Proceedings of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments IV	J.Dawidczyk	Modeling of a nonlinear PIN photodiode reponsivity for studying an optical-microwave mixing process	Wilga, Poland	6159	61592E -1 – 61592E -6
[Pub87]	Proceedings of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments IV	M.Klimczak, P.Witoński, A.Ryter, R.Piramidowicz	Modelling of short-wavelength operation of Nd3+ doped fluorozirconate glass fiber laser.	Wilga, Poland	6159	615928-1 – 615928-9
[Pub88]	Proceedings of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments IV	T.Zychowicz, J.Krupka	Measusremnts of conductivity of thin metal films at microwave frequencies	Wilga, Poland	6159	61591X -1-8
[Pub89]	Proceedings of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments IV	R.Kisiel	Plymers for Electrical Connections in Printed Circuits Boards	Wilga, Poland	6347	63471U -1 – 63471U -7
[Pub90]	Proceedings of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments IV	M.Borecki, M.Korwin-Pawłowski, M.Bebłowska	Light transmission characteristics of silica capillaries	Wilga, Poland	6347	634715 – 63475 - 7
[Pub91]	Proceedings of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments IV	M.Borecki, M.Bebłowska, P.Wrzosek	The proposition of reflectometric fibre optic load sensor	Wilga, Poland	6347	63471P - 63471P -6
[Pub92]	Proceedings of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments IV	M.Borecki, J.Szmidt, P.Wrzosek, M.Bebłowska	Optical fiber switch for sensor networks: design principles	Wilga, Poland	6347	63471Q - 63471Q 12
[Pub93]	Proceedings of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments IV	M.Klimczak, P.Witoński, W.Żurawski, R.Piarmidowicz	Operating conditions of dysprosium activated fluorozirconate fiber laser in the visible	Wilga, Poland	6347	634718-634718-4

[Pub94]	Proceedings of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments IV	K.Zielniński, M.Klimczak, M.Kaczkan, P.Witoński, R.Piramidowicz	Prototyping of virtual photonic laboratory	Wilga, Poland	6347	63472S - 63472S -5
[Pub95]	Proceedings of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments IV	K.Kiełbasiński, J.Kalenik, R.Kisiel	Investigation of electromigration on printed circuit boards soldered	Wilga, Poland	6347	63471V -1 – 63471V -8
[Pub96]	Proceedings of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments IV	M.Borecki, P.Wrzosek, M.Bebłowska, J.Kruszewski	Optimal model for active optical fiber in amplifier applications	Wilga, Poland	6159	615927-1 - 615927-6
[Pub97]	Proceedings of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments IV	M.Borecki	Clad radioation rating in optical polymer fibers	Wilga, Poland	6159	615929-1- 615929-7
[Pub98]	Proceedings of SPIE Photonics Europe 2006, Photonics in Multimedia, 3-7 April	P.Garbat, M.Kujawińska, M.Węgiel	3D visualization of true variable in time objects based on data from optical measurement system	Strasbourg, France	6196	61960J
[Pub99]	Proceedings of the Sympsium on Photonic Technologies for 7th Framework Program	M.Borecki, M.L.Korwin-Pawłowski, M.Bebłowska	Capillaries as optical fibers in sensing device applications	Wrocław, Poland		454-462
[Pub100]	Proceedings of the Sympsium on Photonic Technologies for 7th Framework Program	P.Szczepański, A.Mossakowska-Wyszyńska, A.Tyszka-Zawadzka	Light generation in photonic crystal lasers	Wrocław, Poland		151-154
[Pub101]	Proceedings of the Sympsium on Photonic Technologies for 7th Framework Program	A.Mossakowska-Wyszyńska, P.Szczepanski	Modulation bandwidth of photonic crystals lasers – various structures	Wrocław, Poland		420-424
[Pub102]	Proceedings of the Sympsium on Photonic Technologies for 7th Framework Program	A.Tyszka-Zawadzka, M.Koba, P.Szczepański	Spontaneous emission in one-dimensional photonic crystal lasers	Wrocław, Poland		446-449
[Pub103]	Proceedings of the Sympsium on Photonic Technologies for 7th Framework Program	K.Leśniewska-Matys, P.Szczepański	Analysis of nonlinear operation of phased array PC laser	Wrocław, Poland		
[Pub104]	Regulacje prawne, dobre wzorce i praktyki dotyczące korzystania przez podmioty gospodarcze z wyników prac badawczych i innych osiągnięć intelektualnych instytucji akademickich i naukowych	J.Woźnicki	Ocena możliwości wspierania innowacyjności przez uczelnie na gruncie ustawy „Prawo o szkolnictwie wyższym”.	Warszawa, Poland		27-32

[Pub105]	The 2nd EPS-QEOD Europhoton Conference on Solid-State and Fiber Coherent Light Sources, 10-15 September	A.Mossakowska-Wyszyńska, P.Czuma, P.Szczepański	Nonlinear generation of planar waveguide laser with 1D photonic crystal mirrors	Pisa, Italy		4
[Pub106]	The 2nd EPS-QEOD Europhoton Conference on Solid-State and Fiber Coherent Light Sources, 10-15 September	M.Koba, A.Tyszka-Zawadzka, P.Szczepański	Semiclassical theory of multimode operation of photonic crystal laser	Pisa, Italy		24
[Pub107]	Third IEEE International Workshop on Electronic Design, Test and Applications – DELTA'2006	J.Mazierska, J.Krupka, M.Białkowski, M.V.Jacob	Microwave resonator and their use as measurement instruments and sensors	Kuala Lumpur, Malaysia		1-5
[Pub108]	V Krajowa Konferencja Elektroniki, 12-14 June	M.Jakubowska, J.Kalenik, K.Kiełbasiński, R.Kisiel	Stabilność bezołowiowych połączeń lutowanych w grubowarstwowych układach hybrydowych	Darłówko, Poland		295-300
[Pub109]	V Krajowa Konferencja Elektroniki, 12-14 June	R.Kisiel, P.Syryczyk	Lutowanie rozpływowe: wpływ parametrów procesu lutowania na właściwości użytkowe połączeń	Darłówko, Poland		39-44
[Pub110]	VI Konferencja "Uniwersytet Wirtualny: model, narzędzia, praktyka" – 1-3 June	B.Galwas	Rola „kształcenia na odległość" w tworzeniu krajowego systemu „kształcenia przez całe życie".	Warszawa, Poland		1-13
[Pub111]	VI Konferencja "Uniwersytet Wirtualny: model, narzędzia, praktyka" – 1-3 June	B.Galwas, R.Rak, M.Godziemba-Maliszewski, I.Dziarmaga	Doświadczenia z wdrażania i użytkowania platformy moodle	Warszawa, Poland		1-42
[Pub112]	VI Konferencja "Uniwersytet Wirtualny: model, narzędzia, praktyka" – 1-3 June	M.Godziemba-Maliszewski, R.Rak, B.Galwas	Model funkcjonalny uczelnianej sieci laboratorium wirtualnego	Warszawa, Poland		1-62
[Pub113]	VI Konferencja "Uniwersytet Wirtualny: model, narzędzia, praktyka" – 1-3 June	E.Piwowarska, M.Plebańska, K.Pomaska, B.Galwas	Program i realizacja Studium Podyplomowego „Narzędzia i Techniki Wirtualnej Edukacji" – doświadczenia Ośrodka OKNO-PW	Warszawa, Poland		1-5
[Pub114]	VI Konferencja "Uniwersytet Wirtualny: model, narzędzia, praktyka" – 1-3 June	R.Michalak, M.Morawski, B.Galwas	Nowy model podręcznika elektronicznego z multimedialną warstwą wykładów opracowany przez OKNO-PW - K	Warszawa, Poland		1
[Pub115]	VI Konferencja "Uniwersytet Wirtualny: model, narzędzia, praktyka" – 1-3 June	B.Galwas, E.Grzejszczyk, E.Piwowarska, E.Latos, J.Barczyk	Problemy realizacji Studiów Inżynierskich w modelu SPRINT	Warszawa, Poland		1-15
[Pub116]	V Sympozjum Naukowe Techniki Przetwarzania Obrazu, 16-18 November	M.Sutkowski, P.Garbat, E.Nowinowski-Kruszelnicki, J.Woźnicki, A.	Badanie transmisji układu z przestrzenną funkcją polaryzacji	Serock, Poland		
[Pub117]	V Sympozjum Naukowe Techniki Przetwarzania Obrazu, 16-18 November	M.Sutkowski, T.Grudniewski, J.Parka, E.Nowinowski-Kruszelnicki	Metody zapisu interferogramów w przetwornikach ciekłokrystalicznych z wykorzystaniem wiązek laserowych o niskiej mocy	Serock, Poland		

[Pub118]	V Sympozjum Naukowe Techniki Przetwarzania Obrazu, 16-18 November	P.Garbat	Wizualizacja obiektów trójwymiarowych w systemach 3D wideo na podstawie danych w postgaci chmur punktów	Serock, Poland		
[Pub119]	Workshop on Physics of Photonic Crystals and Metamaterials – PPCM'0612-15 June	K.Leśniewska-Matys, J.Siudy, P.Szczepański	Semi-analytical analysis of nonlinear operation of phased array PC laser	Brussels, Belgium		27
[Pub120]	Workshop on Physics of Photonic Crystals and Metamaterials – PPCM'0612-15 June	A.Mossakowska-Wyszyńska, P.Szczepański	Dynamic operation of F-P two dimensional photonic crystal laser	Brussels, Belgium		31
[Pub121]	Workshop on Physics of Photonic Crystals and Metamaterials – PPCM'0612-15 June	P.Czuma, P.Szczepański	Analitical Model of Light Generation in 1D and 2D Photonic Crystal – Semiclassical Approach	Brussels, Belgium		36
[Pub122]	Workshop on Physics of Photonic Crystals and Metamaterials – PPCM'0612-15 June	A.Rudziński, A.Tyszka-Zawadzka, P.Szczepański	Spatial and frequency domain effects in 1D photonic crystal	Brussels, Belgium		39
[Pub123]	X Konferencja Naukowa "Światłowody I ich zastosowania"	M.Borecki, M.Bebłowska, P.Wrzosek	Światłowodowe czujniki do badania amplitudy i kierunku drgań	Krasnobród, Poland		521-533
[Pub124]	XVI International Conference on Microwaves, Radar and Wireless Communications – MIKON, 22-26 May	P.Wojtyra, B.Galwas	Photonic microwave filters	Kraków, Poland		1-4
[Pub125]	XVI International Conference on Microwaves, Radar and Wireless Communications – MIKON, 22-26 May	R.Rajkowski, B.Galwas	Transistor model limitations in harmonics microwave power amplifier	Kraków, Poland		5-8
[Pub126]	XVI International Conference on Microwaves, Radar and Wireless Communications – MIKON, 22-26 May	G.Kędzierski, D.Paluch, J.Skulski, J.Dawidczyk, J.Piotrowski, B.Galwas	Investigations of intermodulation distortions using fragmentary method	Kraków, Poland		9-12
[Pub127]	XVI International Conference on Microwaves, Radar and Wireless Communications – MIKON, 22-26 May	M.Jacob, J.Krupka, K.Derzakowski, J.Maziarska	Measurements of thin polymer films employing split post dielectric resonator technique	Kraków, Poland	3	229-231
[Pub128]	XVI International Conference on Microwaves, Radar and Wireless Communications – MIKON, 22-26 May	B.Givot, J.Krupka, K.Lees, R.Clarke, G.Hill	Accurate measurements of permitivity and dielectric loss tangent of low loss dielectrics at frequency range 100 MHz – 20GHz	Kraków, Poland	3	232-235
[Pub129]	XVI International Conference on Microwaves, Radar and Wireless Communications – MIKON, 22-26 May	A.Abramowicz, K.Derzakowski, J.Krupka	Optimization of spurious response in dielectric resonator tunable filters	Kraków, Poland	3	338-341

[Pub130]	XVI International Conference on Microwaves, Radar and Wireless Communications – MIKON, 22-26 May	B.Dziurdzia, J.Krupka, W.Gregorczyk	Characterization of thick-film dielectric at microwave frequencies	Kraków, Poland	3	361-364
[Pub131]	XVI International Conference on Microwaves, Radar and Wireless Communications – MIKON, 22-26 May	J.Baker-Jarvis, M.D.Janezic, J.Krupka	Measurements of coaxial dielectric samples employing both transmisson/reflection and resonant techniques to enhance air-gap corrections	Kraków, Poland	3	1093-1096
[Pub132]	XVI International Conference on Microwaves, Radar and Wireless Communications – MIKON, 22-26 May	J.Krupka, J.Breeze, Neil McN.Alford, A. E.Centeno, L.Jensen. T.Claussen	Measurements of permitivity and dielectric loss tangent of high resistivity float zone silicon at microwave frequencies	Kraków, Poland	3	1097-1100
[Pub133]	XVIII IEEE-SPIE Symposium on Photonics, Electronics and Web Engineering, 29 May – 4 June	M.Klimczak. P.Witoński, W.Żurawski, R.Piramidowicz	Operating conditions of dysprosium activated fluorozirconate fiber laser in the visible	Wilga, Poland		
[Pub134]	XVIII IEEE-SPIE Symposium on Photonics, Electronics and Web Engineering, 29 May – 4 June	M.Cieślik, M.Klimczak, M.Kaczkan, R.Piramidowicz	UV and violet emission properties of Ho3+ doped ZBLAN glasses	Wilga, Poland		
[Pub135]	XVIII IEEE-SPIE Symposium on Photonics, Electronics and Web Engineering, 29 May – 4 June	K.Zieliński, M.Klimczak, M.Kaczkan, P.Witoński, R.Piramidowicz	Prototyping of virtual photonic laboratory	Wilga, Poland		
[Pub136]	XXX International Conference of IMAPS Poland Chapter	R.Kisiel, J.Borecki, J.Felba, A.Mościcki	Climatic testing of PCB interconnections made by electrically conductive adhesives	Kraków, Poland		335-338
[Pub137]	XXX International Conference of IMAPS Poland Chapter	M.Jakubowska, K.Kiełbasiński, J.Kalenik, R.Kisiel	Mechanical strength of lead-free solder joints in thick film hybrid circuits	Kraków, Poland		229-233
[Pub138]	XXX International Conference of IMAPS Poland Chapter	J. zmidt, R.Kisiel, Z.Szczepański, M.Guziewicz, B.Cholewa, M. Sochacki	Ohmic contacts and interconnections for high temperature SiC devices	Kraków, Poland		111-116
[Pub139]	XXXV Internationa School on Physics of Semiconductor Compounds 17-23 June	M.Sakowicz, J.Łusakowski, K.Karpierz, M.Grynberg, B.Majkusiak	Alternating current magnetoresistance studies of Si MOSFETs	Jaszowiec, Poland		1

6.4. Scientific and Technical Books

Number	Authors	Publisher	Title, volume, pages
[Pub140]	R.Kisiel	Wydawnictwo BTC	Podstawy technologii dla elektroników, p.204
[Pub141]	J.Szmidt, A.Zaręba	Oficyna Wydawnicza Politechniki Warszawskiej	Laboratorium przyrządów półprzewodnikowych, p.163
[Pub142]	J.Woźnicki	Oficyna Wydawnicza Politechniki Warszawskiej	Nowe podejście do standardów kształcenia w szkolnictwie wyższym, p. 6

7. REPORTS

[Rep1] **Analysis of boundary condition of the molecular gas flow, model construction and its implementation in Moly Flow..er Plus Statistics computer program** (Analiza warunków brzegowych przepływu molekularnego i opracowanie modułu programu Moly Flow..er Plus Statistics realizującego obliczenia symulacyjne dla różnych warunków brzegowych), project leader: Piotr Szwemin

[Rep2] **Analysis of high vacuum standard based on the global model** (Analiza właściwości wzorców wysokich próżni w oparciu o model globalny), project leader: Piotr Szwemin

[Rep3] **Analysis of modulation bandwidth in planar lasers with photonic band gap (**Analiza pasma modulacji w laserach planarnych z przerwą fotonową**),** project leader: Agnieszka Mossakowska-Wyszyńska

[Rep4] **Charge pumping as a tool for characterization of electrophysical parameters of new-generation MIS devices** (Metoda pompowania ładunku jako narzędzie do charakteryzacji parametrów elektrofizycznych nowych generacji przyrządów typu MIS), project leader: Lidia Łukasiak

[Rep5] **Coherence properties of light generated by photonic crystal lasers** (Zagadnienie koherencji promieniowania generowanego w laserach z ośrodkiem aktywnym w postaci kryształu fotonowego), project leader: Paweł Szczepański

[Rep6] **Controlling Leakage Power in NanoCMOS SoCs, European Commission 6 Framework Programme - Integrated Project CLEAN (FP6 – 4 – IST – 4 – 026980 – IP – CLEAN),** project leader: Wiesław Kuźmicz

[Rep7] **Diamond-like carbon films in optical waveguide sensing techniques** (Warstwy diamentopodobne w światłowodowej technice czujnikowej), project leader: Jan Szmidt

[Rep8] **Elaboration of upconversion fiber laser for visible wavelengths** (Opracowanie i wykonanie modułu lasera włóknowego na zakres widzialny z konwersją wzbudzenia), project leader: Michał Malinowski

[Rep9] **Electrically conductive adhesives for inner layer connections in printed circuit boards** (Kleje elektrycznie przewodzące do realizacji połączeń międzywarstwowych w płytkach drukowanych), project leader: Ryszard Kisiel

[Rep10] **Extremely shallow (<10nm) silicon implantation (e.g. with nitrogen) for gate stack formation of future generations of microelectronics and nanoelectronic devices** (Ekstremalnie płytko (<10 nm) implantowany (np. Azotem) krzem w konstruowaniu struktur bramkowych dla przyszłych generacji przyrządów mikroelektroniki i nanoelektroniki), project leader: Romuald B. Beck

[Rep11] **Fibre optical sensor of loading with controllable sensitivity study and realization** (Opracowanie i wykonanie światłowodowego czujnika obciążenia o regulowanej czułości), project leader: Michał Borecki

[Rep12] **Formation and characterization of structures with ultra thin SiO_xN_4 layers on substrates containing SiGe"** (Wytwarzanie i charakteryzacja struktur z ultracienką warstwą SiO_xN_y na podłożach zawierających warstwy SiGe), project leader: Romuald B. Beck

[Rep13] **Integration of silicon-technology IC with a nuclear-radiation detector fabricated in a SOI substrate** (Integracja układu scalonego wykonanego w technologii krzemowej z detektorem promieniowania jądrowego wykonanego w podłożu płytki SOI), project leader: Andrzej Jakubowski

[Rep14] **Investigation of LC-cells' photo refractive and electro-optical properties** (Badanie właściwości elektrooptycznych i fotorefrakcyjnych przetworników ciekłokrystalicznych), project leader: Janusz Parka

[Rep15] **Investigations of effectiveness of CAD algorithms in distributed multiprocessor environment** (Badania efektywności algorytmów CAD realizowanych w wersji wieloprocesorowej i rozproszonej), project leader: Wiesław Kuźmicz

[Rep16] **Measurements of the complex permittivity of silicon at microwave frequencies** (Badanie zespolonej przenikalności elektrycznej w zakresie częstotliwości mikrofalowych), project leader: Jerzy Krupka

[Rep17] **Modelling and investigation of waveguide amplifying and lasing structures** (Modelowanie i badanie światłowodowych struktur wzmacniających i laserowych), project leader: Michał Malinowski

[Rep18] **Network of Excellence for Micro-Optics – NEMO, Network of Excellence within 2nd IST 6FP of UE** (Mikronowe i sub-mikronowe przyrządy dla fotoniki - NEMO), project responsible person in IMiO: Paweł Szczepański

[Rep19] **New possibilities of the UV generation in ion lasers in the noble gases and its mixtures** (Nowe możliwości generacji promieniowania UV w jonowych laserach pracujących na gazach szlachetnych i ich mieszaninach), project leader: Jerzy Kęsik

[Rep20] **PC Signal Analyser** (Komputerowy analizator sygnałów), project leader: Jerzy Skulski

[Rep21] **Plasma methods for passivation of silicon carbide devices** (Plazmowe metody pasywacji przyrządów wytwarzanych w węgliku krzemu), project leader: Jan Szmidt

[Rep22] **Polarization sensitive liquid crystal filter in the digital image processing system** (Spektralno – polaryzacyjny filtr ciekłokrystaliczny w systemie cyfrowego przetwarzania i analizy obrazu), project leader: Jerzy Woźnicki

[Rep23] **PV Enlargement – Technology Transfer, Demonstration and Scientific Exchange Action for the Establishment of a strong European PV Sector,** project leader: Stanislaw M. Pietruszko

[Rep24] **Semi classical theory of light generation in circular-grating distributed-feedback lasers** (Półklasyczna teoria generacji promieniowania w laserze z rozłożonym sprzężeniem zwrotnym DBR\DFB z siatką o symetrii cylindrycznej z uwzględnieniem przestrzennego rozkładu pola), project leader: Robert Paszkiewicz

[Rep25] **Semiclassical model of light generation in 2-dimensional active Photonic Crystals** (Półklasyczny model generacji promieniowania w laserze o ośrodku aktywnym na bazie dwuwymiarowego kryształu fotonowego), project leader: Paweł Szczepański

[Rep26] **Silicon-based Nanodevices – SINANO, Network of Excellence within IST 6FP of UE** (Przyrządy naonelektroniki oparte na krzemie – SINANO), project leader: Romuald B.Beck

[Rep27] **Study and realization of fiber optical load sensor with controllable responsivity** (Opracowanie i wykonanie światłowodowego czujnika obciążenia o regulowanej czułości), project leader: Michał Borecki

[Rep28] **Study of technology and construction as well as realization of micro mechanical switch** (Opracowanie technologii i konstrukcji oraz wykonanie przełącznika mikromechanicznego), project leader: Michał Borecki

[Rep29] **Test vectors generation for digital CMOS integrated circuits based on statistical analysis of manufacturing defects** (Generacja wektorów testowych dla cyfrowych układów scalonych CMOS wykorzystująca statystyczną analizę defektów produkcyjnych), project leader: Witold Pleskacz

[Rep30] **The sensor module study and realization for measurement of vibration** (Opracowanie i wykonanie modułu czujnika do pomiaru wibracji), project leader: Michał Borecki

[Rep31] **Thematic Network on Silicon on Insulator Technology, Devices and Circuits - Coordination Action EUROSOI,** project leader: Bogdan Majkusiak

[Rep32] **Thin film $BaTiO_3$ ceramics for metal-ferroelectric-semiconductor (MFS) structures** (Cienkowarstwowa ceramika $BaTiO_3$ dla struktur metal-ferroelektryk-półprzewodnik (MFS)), project leader: Aleksander Werbowy

8. PATENTS

[Pat1] J.Kęsik, W.Kamiński, J.Lipkowski, M.Osiniak, **Ion laser power supply** (Zasilacz jonowego lasera gazowego), Zgłoszenie patentowe nr P.380799 złożone w Urzędzie Patentowym RP 9.10.2006

[Pat2] J.Kęsik, M.Osiniak, W.Kamiński, **Method for regulating pressure in ion laser discharge tubes** (Sposób zmiany ciśnienia gazu aktywnego w rurze wyładowczej lasera gazowego i rura wyładowcza do jego stosowania), Zgłoszenie patentowe nr P.380317 złożone w Urzędzie Patentowym RP 26.07.2006

9. CONFERENCES, SEMINARS AND MEETINGS

9.1. International Conferences

[Con1] **2nd EPS-QEOD Europhoton Conference on Solid-State and Fiber Coherent Light Sources**, Pisa, Italy, 10-15 September
participants:A. Tyszka-Zawadzka, P. Szczepański

[Con2] **6th International Conference on f-elements ICFE6,** Wrocław, Poland, 4-9 September
participants: M. Malinowski, R. Piramidowicz, M. Nakielska

[Con3] **7th IEEE Latina-American Test Workshop (LATW2006) – „DefSim: CMOS Defects on Chip for Research and Education,"** Buenos Aires, Argentyna, 24 March – 3 April
participant:W. Pleskacz

[Con4] **7th Symposium Diagnostics & Yield Advanced Silicon Devices and Technologies for ULSI Era,** Warszawa, Poland, 26-28 June
organizing committee members: A. Jakubowski, Lidia Lukasiak, R.B. Beck, S. Szostak, T. Bieniek, W. Ciemiewski, K. Dalbiak, G. Gluszko, J. Grabowski, R. Gronau, R.Mroczynski, J. Steszewski, M. Trzaskowska,
participants: R. B. Beck, A. Jakubowski, B. Majkusiak, L. Łukasiak, Z. Pióro, S. Szostak, J. Walczak, A. Zaręba, J. Gibki, J. Maciak, A. Siennicki, T. Bieniek, J. Grabowski, M. Iwanowicz, J. Jasiński, M. Kalisz, A. Mazurak, R. Mroczyński, J. Stęszewski

[Con5] **11th Join Vacuum Conference,** Czech Rep., 24–28 September
participants: M. Niewiński, P. Szwemin

[Con6] **17th European Conference on Diamond, Diamond-Like Materials, Carbon Nanotubes and Nitrides,** Portugal, 5–9 September
participant: M. Śmietana

[Con7] **25th International Conference on Microelectronics MIEL'2006**, Bergrade, Serbia and Montenegro, 14-17 May
participant: W. Pleskacz

[Con8] **28th International Conference on Physics of Semiconductors**, Vienna, Austria 24-28 July
participant:B. Majkusiak

[Con9] **45th European ICT Congress**, Athens, Greece, 30 August - 2 September
participant: P. Szczepański

[Con10] **EMPS'2006 4th European Micro-electronics and Packaging Symposium**, Terme Četež, Slovenia, 21 – 24 May
participant: R. Kisiel

[Con11] **EOS Topical Meeting on Nanophotonics, Metamaterials and Optical Microcavities EOS Annual Meeting 2006,** Paris, France, 16-19 October
participants: A. Tyszka-Zawadzka, P. Szczepański

[Con12] **European Solid State Cirruit Conference ESSCIRC'06,** Swiss, 18–23 September
participant: W. Kuźmicz

[Con13] **Int. Conference "Mixed Design of Integrated Circuits and Systems – MIXDES'2006,"** Gdynia, Poland, 22-24 June
participants: W. Kuźmicz, A. Pfitzner, W. Pleskacz, D. Kasprowicz, E. Piwowarska

[Con14] **International Conference „Vacuum and Plasma Surface Engineering,"** Liberec-Hejnice, Czech Rep., 26-27 October
participants: T. Zychowicz, R. Gronau, J. Szmidt, M. Trzaskowska, J.Kalenik, M. Borecki, A. Werbowy, P. Firek, N. Kwietniewski, D. Maj, T. Nowak, T. Szabłowski

[Con15] **MMA'2006 - 4th International Conference on Microwave Materials and their Applications,** Oulu, Finland, 11-15 June
participant: J. Krupka

[Con16] **SPIE Photonics Europe 2006, Photonics in Multimedia**, Strasbourg, France, 3-7 April
participant: Piotr Garbat

[Con17] **Symposium on Photonics Technologies for the 7th Framework Programme, OPERA-2015,** Wrocław, Poland, 11-14 October
participants:A. Mossakowska-Wyszyńska, R. Piramidowicz, M. Borecki

[Con18] **XVI International Conference on Microwaves, Radar and Wireless Communications – MIKON'2006,** Kraków, Poland, 22-26 May
participants: J. Krupka, J. Skulski, D. Paluch, G. Kędzierski, P. Wojtyra

[Con19] **XVIII IEEE-SPIE Symposium on Photonics, Electronics and Web Engineering,** Wilga, Poland 29 May – 4 June
participants: R. Piramidowicz, M.Klimczak

[Con20] **XXX International Conference of IMAPS Poland Chapter,** Kraków, Poland, 24-27 September
participants: J. Kalenik, R. Kisiel, J. Szmidt

9.2. Local Conferences

[Con21] **8 Symopozjum Techniki Laserowej – STL'2006,** Świnoujście, Poland, 24-29 September
participants: P. Czuma, M. Kaczkan, W. Kamiński, J. Kęsik, M. Malinowski, A. Mossakowska-Wyszyńska, R. Piramidowicz, P. Szczepański, A. Tyszka-Zawadzka, P. Warda, P. Witoński

[Con22] **Conference: Model awansu naukowego w Polsce,** Kraków, Poland, 17-18 March
participant: J. Woźnicki

[Con23] **II Sympozjum Spektroskopowe,** Wrocław, Poland, 15-17 October
participant: M. Malinowski

[Con24] **IX Konferencja Naukowa "Czujniki Oproelektroniczne I Elektroniczne COE'2006,"** Zakopane, Poland, 19-22 June
participant: M. Borecki

[Con25] **V Krajowa Konferencja Elektroniki**, Darłówko, Poland, 12-14 June
participants: J. Kalenik, R. Kisiel

[Con26] **V Sympozjum Naukowe Techniki Przetwarzania Obrazu,** Serock, Poland, 16-18 November
organizing committee members: J. Woźnicki, H. Gorkiewicz-Galwas, P. Garbat, M. Sutkowski, J. Parka, J. Domański,
participants: J. Woźnicki, H. Gorkiewicz-Galwas, P. Garbat, M. Sutkowski, J. Parka, J. Domański,

[Con27] **VI Konferencja "Uniwersytet Wirtualny: model, narzędzia, praktyka,"** Warszawa, Poland, 1-3 June
participant: B. Galwas

[Con28] **X Konferencja Naukowa "Światłowody i ich zastosowania,"** Krasnobród, Poland, 4-7 October
participant: M. Bebłowska

[Con29] **XXI ogólnopolska konferencja Dylematy studiów dwustopniowych,** Łódź, Poland, 16-17 June
participant: J. Woźnicki

9.3. Schools, Seminars and Meetings

[Con30] **2nd Workshop EURSOI'2006**, Grenoble, France, 8-10 March
participant: B. Majkusiak

[Con31] **8th International Seminar on Power Semiconductors ISPS'06,** Prague, Czech Rep., 29 August -2 September
participant: J. Szmidt

[Con32] **11th Internationa Workshop on Computational Electronics,** Vienna, Austria, 25-27 May
participant: B. Majkusiak

[Con33] **16th International Travelling Summer School on Microwaves and Lightwaves,** Warszwa, Poland, 8-14 July
organizing committee members: B. Galwas, K. Madziar
participants: J B. Galwas, M. Malinowski, P. Szczepański,

[Con34] **IEEE East-West Design & Test International Workshop EWDTW'06,** Sochi, Russia, 15-19 September
participant: D. Kasprowicz

[Con35] **IEEE Wokshop on Design and Diagnostics of Electronic Circuits and Systems (DDECS'2006),** Czech Rep., 18–22 April
participant: W. Pleskacz

[Con36] **Institute Seminar:** Aplikacje optoelektroniczne struktur światłowodowych, 19 October
participant: M. Borecki

[Con37] **Institute Seminar:** Czujniki gazowe z zastosowaniem nanomateriałów, 28 September

[Con38] **Institute Seminar:** Mikrosystem optoelektroniczny do badania nanoobjętościowychpróbek cieczy z wykorzystaniem kapilar optycznych, 6 December
participant: P. Wrzosek

[Con39] **International Workshop on Advanced Spectroscopy and Optical Materials (IWASOM),** Gdańsk, Poland, 11-14 June
participants: M. Malinowski, R. Piramidowicz, M. Kaczkan, M. Nakielska, M. Klimczak

[Con40] **International Workshop on Liquid Crystals for Photonics, Belgium,** 25–30 April
participants: M. Sutkowski, J. Parka

[Con41] **Nanoscaled Semiconductor-on-Insulator Structures and Devices, NATO Advanced Research Workshop**, Sudak, Crimea, Ukraine, 15-19 October
participant: B.Majkusiak

[Con42] **NEMO scientific network meeting,** Karlsruhe, Germany, 9-10 February
participants: P. Szczepański, A. Mossakowska-Wyszyńska, K. Leśniewska-Matys, A. Tyszka-Zawadzka, R. Piramidowicz, M.Klimczak, P. Czuma

[Con43] **Workshop on Nanotechnology applications in biosensors systems,** Italy, 4-8 December
participant: M. Śmietana

[Con44] **Workshop on Physics of Photonic Crystals and Metamaterials – PPCM'06,** Brussels, Belgium, 12-15 June
participant: P. Szczepański

[Con45] **XXXV Internationa School on Physics of Semiconductor Compounds**, Jaszowiec, Poland, 17-23 June
participant: B. Majkusiak

10. PRIZES

[Prize1] Mikołaj Baszun, Romuald B. Beck, **Warsaw University of Technology Rector's Team Prize, (**Nagroda Zespołowa JM Rektora PW za sukcesy badawcze przy realizacji międzynarodowego projektu badawczego 6 P.R. COE (akronim – COMBAT))

[Prize2] Jarosław Dawidczyk, **Warsaw University of Technology Rector's Individual Prize for his dissertation thesis, (**Nagroda Indywidualna JM Rektora PW za wyróżnioną rozprawę doktorską pt.: „Badanie procesów opto-mikrofalowej przemiany częstotliwościna fotodetektorach PIN")

[Prize3] Hanna Górkiewicz -Galwas, **Medal of National Education Commission,** (Medal Komisji Edukacji Narodowej)

[Prize4] Andrzej Jakubowski, Lidia Łukasiak, Romuald B. Beck, Aleksander Werbowy, **Warsaw University of Technology Rector's Team Prize, (**Nagroda Zespołowa JM Rektora PW za popularyzację badań naukowych w dziedzinie przyrządów mikro- i nano-elektroniki przez zorganizowanie cyklu międzynarodowych konferencji naukowych pod tytułem „Diagnostic and Yield")

[Prize5] Jerzy Krupka, **Golden Cross** (Złoty Krzyż Zasługi)

[Prize6] Wiesław Kuźmicz, Elżbieta Piwowarska, Witold Plaskacz, Zbigniew Jaworski, **Minister's of Education and Science Team Prize, (**Nagroda Zespołowa Ministra Nauki i Szkolnictwa Wyższego za organizację i koordynację europejskiego programu edukacyjnego w zakresie mikroelektroniki i mikrosystemów REASON (Research and Training Action for System on Chip Design))

[Prize7] Marek Sutkowski, **3rd stage prize on V Sympozjum Naukowe TPO2006, (**III nagroda za prezentację pracy na V Sympozjum Naukowym TPO2006)

[Prize8] Jan Szmidt, **Warsaw University of Technology Rector's Individual Prize for scientific achievements, (**Nagroda Indywidualna JM Rektora PW za osiągnięcia naukowe w zakresie badań warstw diamentowych dla zastosowań w mikroelektronice i optoelektronice, podsumowane i rozwinięte w monografii „Technologie diamentowe – diament w elektronice")

[Prize9] Jerzy Woźnicki, **Medal of National Defence Minister** (Medal "Za zaslugi dla obronności kraju")