INSTITUTE OF MICROELECTRONICS AND OPTOELECTRONICS

ANNUAL REPORT

2005

Edited by Agnieszka Mossakowska-Wyszyńska

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From the Director

This Annual Report summarizes the research activities of the Institute In 2005, as well as the teaching activities in the academic year 2004/2005. 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 WUT 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, and last but not least the Centre of Photovoltaics (established in November 2002). 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 2006

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;
- Optoelectronic and Hybrid Devices 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 the methods and measuring systems for electronic materials and electronic devices studies;
- generation of microwaves, microwave measurement techniques, and numerical methods for electromagnetics;
- processing, designing, optimisation techniques and development of VLSI (very large scale integration of circuits) computer-aided tools;
- developing the hybrid circuits technology with special emphasis on thick-film technology and its applications to hybrid microwave integrated circuits;
- laser physics (Fabry-Perot and distributed feedback lasers), laser spectroscopy of solid state active materials, and applications of lasers in medicine, manufacturing and telecommunications;
- construction and characterisation of optoelectronics elements and devices including fibre sensors, photovoltaics;
- computer-aided design of photoelectronic 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. PV Centre, 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.

1.2. Board of Directors

Director of the Institute
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Deputy-Director for Teaching Affairs
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1.3. Microelectronics and Nanoelectronics Devices Division

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Senior academic staff

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

Junior academic staff

Tomasz Bieniek, M.Sc.,	Ph.D. Student
Jarosław Grabowski, M.Sc.,	Ph.D. Student, Assistant
Marcin Iwanowicz M.Sc.,	Ph.D. Student

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Małgorzata Kalisz, M.Sc.,	Ph.D. Student
Andrzej Kociubiński, 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 ultrathin 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 ultrathin 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 ultrathin dielectric layers for MOSFET gate dielectric (SiO_2, Si_3N_4, SiO_xN_y).
- Ultrashallow implantation from r.f. plasma;
- Very low temparuture processing of test structure;
- MEMS/MOEMS processing.

1.4. VLSI Engineering and Design Automation Division

Head of the Division
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Senior academic staff

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Grzegorz Janczyk, M.Sc.	Assistant Professor
Zbigniew Jaworski, Ph.D.	Assistant Professor
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, M.Sc.	Lecturer

Junior academic staff

Dominik Kasprowicz, M.Sc.	Ph.D. Student
Arkadiusz Łuczyk, M.Sc.	Assistant, Ph.D. Student
Michał Rakowski, M.Sc.	Ph.D. Student
Anna Sidlarewicz, M.Sc.	Ph.D. Student

Technical and administrative staff
Jerzy Gempel, M.Sc.
Stanisław Jeszka, M.Sc.

The research carried out in the division falls into main area: design of microelectronics IC's (integrated circuits) and application of microelectronics in digital signal processing.

To name a few examples of its research topics:

- methods of formal and functional verification of IC design: methods of verification of logical circuits, methods of determination of circuit topography sensitivity on spot defects;
- novel mathematical methods of technological processing modelling in application to statistical simulation;
- novel two-dimensional mathematical simulation of semiconductor devices.

Current research projects in the Division are as follows:

- 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 with biomedical applications, methodologies of testing and design for testability of analogue VLSI integrated circuits;
- development of CAD tools for integrated circuit design and verification, with special emphasis on analogue full custom ASICs design;
- investigations of signal propagation and crosstalk in long interconnections in submicron VLSI circuits;
- design of digital and mixed VLSI circuits for special applications: CNN, data processing in physical experiments, etc.;
- fully integrated CMOS implementation of electronic circuits for spread spectrum communication based on chaos generators.

1.5. Microwave Electronics and Photonics Division

Head of the Division

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Jerzy Piotrowski, Ph.D.	Assistant Professor
Agnieszka Szymańska, Ph.D.	Assistant Professor
Piotr Witoński, Ph.D.	Assistant Professor
Bernard Jakubowski, Ph.D.	Senior Lecturer
Jerzy Skulski, M.Sc.	Senior Lecturer

Junior academic staff

Grzegorz Kędzierski, 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, photovaractors, phototransistors;
- modelling of semiconductor optical devices for telecommunication;
- optoelectronic and microwave devices for data transmission networks.

1.6. Optoelectronic and Hybrid Devices Division

Head of the Division

Jerzy Kruszewski, Ph.D., D.Sc. Professor

Since October 17st, 2005

Jan Szmidt, Ph.D., D.Sc., Tenured Professor
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Jerzy Krupka, Ph.D., D.Sc.	Professor
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Maria Bebłowska, Ph.D.,	Assistant Professor
Michał Borecki, Ph.D.,	Assistant Professor
Jerzy Kalenik, Ph.D.,	Assistant Professor
Ryszard Kisiel, Ph.D.,	Assistant Professor
Zdzisław Mączeński, Ph.D.	Assistant 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

Junior academic staff

Piotr Firek, M.Sc.,	Ph.D. Student
Ryszard Gronau, 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
Mateusz Śmietana, M.Sc.,	Ph.D. Student
Paweł Śniecikowski, M.Sc.,	Ph.D. Student
Tomasz Zychowicz, M.Sc.	Ph.D. Student

Technical and administrative staff

Ryszard Biaduń,
Maciej Juźwik, M.Sc.
Leszek Kryczka, B.Sc.
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 lightwave 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,
- electronic packaging technology,
- 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.

1.7. Optoelectronics Division

Head of the Division
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Senior academic staff

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Tadeusz Adamowicz, Ph.D., D.Sc.	Associate Professor
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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

Paweł Czuma, M.Sc.	Ph.D. Student
Mariusz Klimczak, M.Sc.	Ph.D. Student
Marcin Koba, M.Sc.	Ph.D. Student
Monika Kowalska, M.Sc.	Ph.D. Student
Radosław Kreft, M.Sc.	Ph.D. Student
Kamila Leśniewska-Matys, M.Sc.	Ph.D. Student
Adam Rudziński, M.Sc.	Ph.D. Student

Technical and administrative staff
Wojciech Kamiński, M.Sc.

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

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 optogalvanic 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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Senior academic staff

Janusz Parka, Ph.D., D.Sc.	Associate Professor
Piotr Garbat, Ph.D.	Assistant Professor
Michał Pawłowski, Ph.D.	Assistant Professor
Hanna Górkiewicz-Galwas, Ph.D.	Senior Lecturer

Junior academic staff

Robert Żmijan, M.Sc.	Ph.D. Student

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;
- electrooptic effects in liquid crystals and their applications to LCD;
- photorefractive phenomenas in liquid crystals for dynamic holography and optical data storage

1.9. Statistical Data

SPECIFICATION	2004	2005	DIFFERENCE
Academic staff	89	83	-6
Tenured professors	6	8	+2
Professors	6	5	-1
Associate professors	4	2	-2
Assistant professors	28	32	+4
Senior lecturers	8	6	-2
Lecturers	1	1	0
Assistants and Ph.D. students	36	29	-7
Technical staff	17	13	-4
Administrative staff	5	5	0
Space	3254,9	3254,9	0
Teaching laboratories	1275,9	1275,9	0
Other laboratories	341,3	341,3	0
Offices of academic staff	1637,7	1637,7	0
Computers	289	301	+12
Library resources - Books (number of volumes)	3297	3357	+60
Teaching activities	66	56	-10
Basic courses	49	38	-11
Advanced courses	14	15	+1
Special courses	3	3	0
Research projects	46	41	-5
Granted by the University	15	11	-4
Granted by State Institutions	18	19	+1
Granted by International Institutions	10	8	-2
Other projects	3	3	0
Degrees awarded	74	58	-16
D.Sc. degrees	1	0	-1
Ph.D. degrees	2	5	+3
M.Sc. degrees	31	23	-8
B.Sc. degrees	40	30	-10
Publications	148	178	+30
Sci.-tech. books	3	11	+8
Sci.-tech. papers in journals	53	44	-9
Sci.-tech. papers in conference proceedings	92	123	+31
Reports	37	43	+6
Conferences	45	47	+2
Prizes	1	2	+1

2. STAFF

2.1. Senior Academic Staff

Jerzy Kruszewski, 1937 - 2005

Professor of Warsaw University of Technology, M.Sc. ('61), Ph.D. ('70), D.Sc. ('86), Electron Technology, Optoelectronic, Fiber Optics.

Prof. J. Kruszewski was born 31.07.1937 in Białystok. During the II-ed World War he was exiled Kazahstan.

Scientific activity: thin layers engineering, opto-electronic devices, fiber optics sensors and amplifiers. The principal areas of scientific activity: optical system integrated thin-layer material engineering and optical and optoelectronics devices as sensors and micro-systems.

Author and executor of many projects of the nodal problems, government programs, grants of The State Committee for Scientific Research KBN - individual and ordered.

In years 1975 - 1981 coordinator of Integrated Optoelectronics Team at the Electronics and Telecommunication Committee of the Polish Academy of Sciences KEiT PAN, working out the government program PR -3, aggregate member of the CPBR 8.12 program.

In the Electronics and Telecommunication Committee of the Polish Academy of Sciences: 1986 - 1992 Scientific Secretary, 1990 - 1992 Member of Optoelectronics Section.

Member of Polish Chapter SPIE 1982 – 2005, Member of Mat. Research Society 1990 – 2005, Member of Polish Committee of Optoelectronics of Association of Polish Electrical Engineers SEP 1886 – 2005.

Since 1986 the Head of Optoelectronics and Hybrid Devices Division in Institute of Microelectronics and Optoelectronics

The author and co-author of 170 scientific publications (articles, reports, announcements, monograph). Tutor of 3 doctor's degrees and over 160 master's and engineers thesis.

The organizer of symposiums as well as member of several scientific board of national and international conferences. Laureate of the National Education Minister' Prize twice and the Rector' Reward for scientific achievements six times. Distinguished with badge of Deserving for Warsaw University of Technology and the Golden Cross of Service.

Tadeusz Adamowicz, M.Sc. ('62), Ph.D. ('73), D.Sc. ('03), Quantum Electronics, Gas Discharges; Assistant Professor, part time, Optoelectronics Division, Member of Plasma Physics Section at the Committee of Physics of the Polish Academy of Sciences ('94-), Member of IEEE ('99)	room # 125b GR phone: 0-226607778 fax: 0-226288740 e-mail: adamowicz@imio.pw.edu.pl
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Romuald B. Beck, M.Sc. ('76), Ph.D. ('82), D.Sc. ('96), Microelectronics, Electronics, Associate Professor, full time, Head of Microelectronics and Nanoelectronics Devices Division ('04), Leader of the Technology, Diagnostics and Modelling Group ('85-), Vice President of the Microelectronics Section of the Electronics and Telecommunication Committee of the Polish Academy of Sciences ('93-), Member od Programme Committee of: Diagnostics & Yield Conference ('88-), Co-chairman ('02-), Member of Programme Committee of ELTE ('84, '04), Member of Technical Programme Committee ESSDERC ('05-), Senior Member of IEEE ('97-), Member of Electrochemical Society ('98-)	room # 336 GR phone: 0-226257329, 0-226607534 fax: 0-226257329 e-mail: beck@imio.pw.edu.pl
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Bogdan Galwas, M.Sc.('62), Ph.D. ('69), D.Sc. ('76), Microelectronics, Microwave Electronics, Tenured Professor, full time, Head of Microwave Electronics and Photonics Division ('84-), Pro-Rector of WUT ('87-90), Member of Electronics and Telecommunications Committee of the Polish Academy of Sciences ('88-), Member of Scientific Council of Industrial Institute of Telecommunications ('90-), Chairman of the International Management Committee of the	room # 51 GE phone: 0-226607939, 0-228250393 fax: 0-228250393 e-mail: B.Galwas@elka.pw.edu.pl

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International Travelling Summer Schools (‘91-), Director of Ph.D. Studies in Electronics and Telecommunications (‘92-), Senior Member of IEEE (‘94-), Member of Scientific Council of Institute of Telecommunications (‘97-), Member of IACEE (’97-), Member of SEFI (‘97-), Rector's Plenipotentiary for New Technologies and Forms of Education (‘99-), Director of Warsaw University of Technology Center for Distance Learning – OKNO (‘00-), Dean of the Faculty of Electronics and Information Technology ('05-)

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

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

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for dissertation thesis (’97), Editor of Annual Report of Institute of Microelectronics and Optoelectronics (‘00-), Member of SPIE Polish Chapetr (‘02-), Member of Organizing Committee of Conference ELTE (’04), Member of the Faculty Council ('05-), Member of the Dean's Commission for Prize Affairs (’05-)

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Bożena Janus		Senior Technical Clerk	0-226607939
Stanisław Jeszka	M.Sc.	Senior R&D Engineer	0-226607207
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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] **Characterisation of Solid State** (Metody badania ciała stałego), **BCS**, Piotr Szwemin

[Edu5] **CAD and Fabrication of Microwave and Lightwave Circuits** (Komputerowe projektowanie i realizacja obwodów mikrofalowych i optofalowych), **KPROM**, Jerzy Skulski

[Edu6] **Design of Integrated Systems in VLSI Technique** (Projektowanie systemów scalonych w technice VLSI), **PSSV**, Zbigniew Jaworski

[Edu7] **Design of Analog Ciruits for VLSI Systems** (Projektowanie układów analogowych dla systemów VLSI), **PUAV** Wiesław Kuźmicz

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

[Edu9] **Equipment - Programming Synthesis of Digital Systems** (Synteza sprzętowo – programowa systemów cyfrowych), **SSP**, Elżbieta Piwowarska

[Edu10] **Fields and waves**, (Pola i fale), **POFA**, Jerzy Piotrowski

[Edu11] **Fundamentals of Circuit and System Technology** (Podstawy technologii układów i systemów), **PTUIS**, Romuald Beck

[Edu12] **Fundamentals of Lasers** (Lasery - kurs podstawowy), **LKP,** Paweł Szczepański

[Edu13] **Fundamentals of Microelectronics** (Podstawy mikroelektroniki), **PMK**, Wiesław Kuźmicz

[Edu14] **Fundamentals of Microprocessor Techniques** (Podstawy techniki mikroprocesorowej), **TMIK**, Lidia Łukasiak

[Edu15] **Fundamentals of Microwave Engineering** (Podstawy techniki w.cz.), **TWCZ**, Bogdan Galwas

[Edu16] **Fundamentals of Photonics** (Podstawy fotoniki), **FOT**, Michał Malinowski

[Edu17] **Fundamentals of Solid State Electronics** (Elektronika ciała stałego), **ELCS**, Jan Szmidt, Witold Pleskacz

[Edu18] **Hybrid Systems** (Układy hybrydowe), **UKH**, Ryszard Kisiel

[Edu19] **Integrated Optoelectronics** (Optoelektronika zintegrowana), **OZT**, Michał Malinowski, Agnieszka Mossakowska-Wyszyńska

[Edu20] **Introduction to Microsystems** (Wstęp do mikrosystemów), **WMS,** Zbigniew Pióro

[Edu21] **Introduction to the UNIX System** (Użytkowanie systemu UNIX), **USUX**, Andrzej Wielgus

[Edu22] **Laser Physics** (Fizyka laserów), **FLA**, Paweł Szczepański

[Edu23] **Logic Circuits** (Układy logiczne), **ULOGE**, Tadeusz Łuba

[Edu24] **Microelectronics Development Trends** (Kierunki rozwoju mikroelektroniki), **KRM**, Andrzej Jakubowski

[Edu25] **Models and Systems of Image Processing** (Modele i systemy przetwarzania obrazów), **MSPO**, Jerzy Woźnicki

[Edu26] **Numerical Methods** (Metody numeryczne), **MNM**, Institute of Electronic Fundamentals WUT, Jerzy Krupka

[Edu27] **Object Programming in Java** (Praktyka programowania obiektowego w Javie), **PPOJ**, Adam Wojtasik

[Edu28] **Object Programming** (Programowanie obiektowe), **PROBI**, Adam Wojtasik

[Edu29] **Operating Systems** (Systemy operacyjne), **SOE**, Andrzej Wielgus

[Edu30] **Optoelectronic Devices and Systems** (Elementy i systemy optoelektroniczne), **ESO**, Michał Malinowski

[Edu31] **Lightwave Telecommunication** (Telekomunikacja optofalowa), **TEOP**, Bogdan Galwas

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

[Edu33] **Physics of Solid State** (Fizyka ciała stałego), **FCSR**, Jan Szmidt

[Edu34] **Programming 8051 microcontroler** (Programowanie mikrokontrolera), **PMIK**, Lidia Łukasiak

[Edu35] **Semiconductor Devices** (Przyrządy półprzewodnikowe), **PP**, Andrzej Jakubowski, Andrzej Pfitzner

[Edu36] **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 Optoelektronic 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 Microprocessors** (Projektowanie mikroprocesorów), **PMS**, Michał Borecki

[Edu42] **Design of VLSI Circuits** (Projektowanie struktur scalonych VLSI), **PSSCV**, Wiesław Kuźmicz

[Edu43] **Digital Image Processing** (Cyfrowe przetwarzanie obrazów), **CPOO**, Grzegorz Kukiełka

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

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

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

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

[Edu48] **Nanotechnologies** (Nanotechnologie), **NAN**, Jan Szmidt

[Edu49] **Optical Waveguide Lasers and Amplifiers(**Wzmacniacze i lasery światłowodowe), **WLS**, Ryszard Piramidowicz

[Edu50] **Optoelectronics Techniques of Information Processing** (Optoelektroniczne techniki przetwarzania informacji) ,**OTZI**, Janusz Parka, Jerzy Woźnicki

[Edu51] **Physical Fundamentals of Nanoelectronics** (Podstawy fizyczne nanoelektroniki), **PFN**, Bogdan Majkusiak

[Edu52] **Photovoltaic Systems** (Systemy fotowoltaiczne), **SFOT,** Stanisław Pietruszko

[Edu53] **Semiconductor Structures for VLSI and ULSI Circuits** (Struktury półprzewodnikowe dla układów VLSI i ULSI), **SPVU**, Andrzej Jakubowski

3.3. Courses in English

[Edu54] **Electronics 1, EELE1,** Bogdan Majkusiak

[Edu55] **Physics 3, A,** Bogdan Majkusiak

[Edu56] **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 2004 - March 2005, **sub-projects:**

[Pro1.1] **Design of low power CMOS integrated circuits with application to control unit for implantable cardioverter defibrillator** (Projektowanie układów scalonych CMOS bardzo małej mocy, z przykładem zastosowania do sterowania wszczepilanym defibrylatorem), sub-project leader: Wiesław Kuźmicz, co-worker: Zbigniew Jaworski

The goal is to design an integrated controller with extremely low power consumption, for application in implantable cardioverter defibrillators (ICD). This is a lifesaving device for patients with life threatening cardiac arrhythmias. Existing ICDs use a very primitive diagnostic algorithm which often results in unnecessary painful shock therapies applied to the patients' heart. This work aims at hardware implementation of a new control algorithm which practically eliminates unnecessary shocks. For this purpose an ultra low power digital CMOS integrated circuit with special dedicated architecture will be developed.

[Pro1.2] **Developing of microwave measurement computer controlled system idea** (Opracowanie koncepcji mikrofalowego systemu pomiarowego sterowanego przez komputer), sub-project leader: Bogdan Galwas

The goal of this project is to develop the main principles of operation and controlling software for microwave measurement system with network analyzer, which will be used to determine the scattering matrix. Main work tasks are connected with the following topics: developing of the measurement system idea; developing of the software for computer controlling of the system; performing of test run measurements.

[Pro1.3] **Digital image analysis and processing of polarized images** (Analiza obrazów spolaryzowanych metodą przetwarzania cyfrowego), sub-project leader: Jearzy Woźnicki, co-workers: Janusz Parka, Grzegorz Kukiełka, Tomasz Grudniewski, Hanna Górkiewicz-Galwas, Jerzy Domański

Polarized images present the subject of interest of contemporary optics. They carry information about the objects in not clearly visible areas in the scene (masked by fog, smoke, dust et al.) due to the difference of dispersion of lightened electromagnetic wave for both perpendicular wave polarization.

The aim of the project is to propose optimized procedures for polarized images analysis in various spectral ranges. Algorithms of edge segmentation and area segmentation of such images have been elaborated. Application of prepared numerical programs for investigation of polarized images will allow to assess the chosen method of analysis.

[Pro1.4] **Formation and characterization of structures with ultrathine SiO_xN_4 layers on containing SiGe substrates** (Wytwarzanie i charakteryzacja struktur z ultracienką warstwą SiO_xN_4 na podłożach zawierających warstwy SiGe), sub-project leader: Romuald 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 ultrathin SiO_xN_4 layers formation on substrates strained by the SiGe layers. Particular attention has to paid on preserving the strain through compute test structure manufacturing by appreciate changes in the device technology.

[Pro1.5] **High Q-factor microwave resonators – new technologies and measurements of dielectric properties of spherical samples** (Nazwa tematu: Rezonatory mikrofalowe o dużej dobroci – nowe technologie i metody pomiaru), sub-project leader: Jerzy Krupka, co-workers: Mikołaj Baszun, Zdzisław Mączeński, Janusz Rogowski, Jerzy Rudkowski

The main goals of this project are construction and investigation of new hollow spherical dielectric resonators with Bragg effects and development of new technique for the complex permittivity measurements of spherical dielectric samples. This work constitutes part of joint international projects: Polish-Australian linkage grant: INVESTIGATIONS AND CHARACTERIZATION OF NEW MATERIALS FOR WIRELESS COMMUNICATIONS and European grant TUNABLE FILTERS BASED ON DIELECTRIC RESONTORS.

[Pro1.6] **Lead –free solder joints in thick film hybrid circuits – investigation of some chosen properties** (Bezołowiowe połączenia lutowane w grubowarstwowych układach hybrydowych - badanie wybranych właściwości), sub-project leader: Jerzy Kalenik, co-workers: Jerzy Kalenik, Ryszard Kisiel, Ryszard Biaduń, Krystyna Szylko

Since 1.07.2006 lead will be banned from electronic equipment. SnAg and SnAgCu solders were chosen to replace SnPb solder in printed circuit boards. The aim of this work is to investigate some properties of lead-free solder joints to thick film hybrid circuit solder pads.

[Pro1.7] **Modelling and investigation of waveguide laser structures for visible wavelengths** (Modelowanie i badanie falowodowych struktur laserowych na zakres widzialny), sub-project leader: Michał Malinowski

Currently there is interest in developing compact, short wavelength, all solid state laser sources for display, data storage and material processing applications. One of the promising approaches is to use upconversion-pumping schemes leading to laser action at wavelength shorter than that of pump radiation. The program is focused on studying upconversion phenomena in trivalent rare-earth doped fibers and planar waveguides. The significant interest in studying Ho^{3+}, Pr^{3+} and Nd^{3+} materials results from the energy spectrum of these ions containing several metastable multiplets offering possibility of simultaneous laser emission at various wavelengths from ultraviolet to infrared.

[Pro1.8] **The investigation of high vacuum standards properties with use of simulation methods** (Badania parametrów wzorców wysokich próżni metodami symulacyjnymi), sub-project leader: Piotr Szwemin, co-worker: Marek Niewiński

The work was concerned on analyse and evaluation of numerical errors in floating point arithmetic used in Monte-Carlo simulation's routines for determining the gas state parameters in UHV standards. The main focus was put on *errors in summation,* which are very important in evaluation of gas number density. It was showed that format IEEE 754 of number representation is sufficient to getting result with uncertainty of 10^{-4}. Additionally, the gas flux distributions in chambers of IMGC standard were determined. They allow recognising the source of uncertainty in backstream effect's coefficient determination. The simulation software were also extended with two new model of gas surface interaction. They will be tested in future work.

[Pro2] **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:**

[Pro2.1] **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

[Pro2.2] **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.

[Pro2.3] **Formation and characterization of structures with ultrathin 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 ultrathin 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.

[Pro2.4] **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 multicomputer 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.

[Pro2.5] **Investigation of LC-cells' photorefractive and electro-optical properties** (Badanie właściwości elektrooptycznych i fotorefrakcyjnych przetworników ciekłokrystalicznych), sub-project leader: Janusz Parka

Electro-optical and photorefractive 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.

[Pro2.6] **Measurements of the complex permittivity of slicon 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.

[Pro2.7] **Modelling and investigation of waveguide amplifying and lasing structures** (Modelowanie i badanie światłowodowych struktur wzmacniających i laserowych), sub-project leader: Michał Malinowski

[Pro2.8] **PC Signal Analyzer** (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.

[Pro3] **Analysis of planar micro-structured waveguide lasers designed as a phased array of N two-dimensional YAG photonic crystals** (Analiza pracy planarnych, falowodowych laserów sprzężonych fazowo wykonanych na bazie dwuwymiarowych kryształów fotonowych na przykładzie YAG)**,** project leader: Ryszard Piramidowicz, June 2005 – December 2005

Main objective of this work was to investigate the operating conditions of planar, micro-structured waveguide laser, designed as a phased array of N two-dimensional photonic crystals. The performed work specifically comprised the evolvement of the phased waveguide array supermode propagation model as well as description and analysis of the above-threshold lasing parameters. The realizability studies, aimed at determination of technology to be exploit and obtainable spectroscopic parameters were also within the scope of this research.

[Pro4] **Arbitrary-waveform generator for charge pumping** (Generator polaryzacji typu AWG dla metody pompowania ładunku), project leader: Z. Pióro, co-workers: M. Iwanowicz, L. Łukasiak, S. Szostak, June 2005 - December 2005

The aim of the project is to design and implement a model of a module for a generator supplying all signals necessary for characterization of new-generation MIS devices.

[Pro5] **Boron nitride (BN) films produced from triethylborate $(C_2H_5)_3B$ by means of radio frequency chemical vapor deposition (RFCVD) method for microelectronic applications – analysis of the influence of process parameters on electrophysical properties and composition of obtained material** (Warstwy azotku boru (BN) wytwarzane z trójetyloboru $(C_2H_5)_3B$ metodą plazmy o częstotliwości radiowej (RFCVD) dla aplikacji mikroleketronicznych – analiza wpływu parametrów procesu na właściwości elektrofizyczne i skład syntezowanego materiału) project leader: Aleksander Werbowy, co-workers: W. Ciemiewski, K. Dalbiak, P. Firek, N. Kwietniewski, M. Trzaskowska, March 2005 - December 2005.

The main goal of the project was to examine the influence of BN RFCVD process parameters (electrode self-bias potential, process duration and flow rate of reactant gases) on thickness, deposition time as well as resistivity, dielectric strength and chemical composition of so obtained thin film material. The set of the process parameters that allow producing layers demonstrating the most favorable properties from the viewpoint of their potential microelectronic applications was subsequently established using Taguchi's method.

[Pro6] **Design and implementation of measurement setup for image devices investigations** (Zaprojektowanie i wykonanie stanowiska dydaktyczno-badawczego do pomiarów parametrów elektrooptycznych przetworników obrazu), project leader: Janusz Parka, June 2005 – December 2005

Computerized electro-optical measurement setup has been designed and completed. The setup consist a waveform generator, oscilloscope and a specialized GPIB PC card. This setup can have possibility to measure static, dynamic characteristic and other electro-optical parameters of liquid crystal cells at room temperature. It can be useful for scientific research and students' laboratory exercises.

[Pro7] **Diamond films – diamond in electronics** (Warstwy diamentowe – diament w elektronice), project leader: Jan Szmidt, co-workers: A. Szczęsny, M. Trzaskowska, March 2005 - December 2005.

The project enclosed preparation and publishing of a book concerning diamond films, their fabrication technology, characterization and applications in electronics, optics, sensors and micro-machining.

[Pro8] **Investigation of Surface Insulation Resistance of Printed Circuit Boards Soldered with Lead-Free Solder** (Badanie rezystancji powierzchniowej laminatu w obwodach drukowanych lutowanych bezołowiowo), project leader: Jerzy Kalenik, co-workers: Ryszard Kisiel, Ryszard Biaduń, Krystyna Szylko, June 2005 – December 2005

Surface insulation resistsnce SIR of FR-4 laminate with solder pads covered with lead-free solder containing silver was under investigation. Influence of silver content on surface insulation resistance was estimated.

[Pro9] **Investigations of the optical properties of thin dielectric and diamond-like carbon (DLC) films intended for high speed microelectronics** (Badania właściwości optycznych cienkich warstw dielektrycznych oraz warstw diamentopodobnych (DLC) na potrzeby szybkiej mikroelektroniki), project leader: Jan Szmidt, co-workers: Dariusz Maj, Tomasz Nowak, K. Dalbiak. W. Ciemiewski. March 2005 - December 2005.

The work presents results of investigations carried out on optical thin films such as titanium dioxide (TiO_2), aluminium oxide (Al_2O_3) and diamond-like carbon (DLC). Refractive index, transmission and refraction coefficients of the films were specified. Analyses of their electrical and optical properties were carried out. Technology of thin films selective etching for their application in very fast microelectronic and optoelectronic integrated circuits as planar wavegiudes was worked out.

[Pro10] **Influence of the pumping chamber parameters on the number density generated in high vacuum standards** (Analiza wpływu elementów składowych komory pompowej na generowaną koncentrację wewnątrz głowicy wzorcowanej), project leader: Piotr Szwemin, June 2005 – December 2005

This small grant was given to preparation of 3 papers. Two for international journal Metrologia that describe the **„Global model of the gas flow in high vacuum standards"** and **„Comparison of the experimental data and the simulation results of backstreaming effect in the continuos gas expansion vacuum standard."** Both papers were review and accepted for publication in vol.42. Third paper prepared, reviewed and published within this grant was written in Polish: "Influence of the blocking plate in pumpig chamber on the gas flux distrtibutions in high vacuum standards (Analiza wpływu geometrii płytki blokującej komory pompowej na rozkłady gęstości strumienia gazu we wzorcu niskich ciśnień). Published in Sci. Report of WUT No 153.

[Pro11] **Measurement methodology and lab environment for measurements of components of analog integrated circuits** (Metodologia pomiarów i stanowisko pomiarowe do badania elementów analogowyh układów scalonych), project leader: Wiesław Kuźmicz, June 2005 – December 2005

The goal of this work is to develop measurement methodology and appropriate lab environment for experiments with components of analog CMOS integrated circuits for a student lab.

In the framework of a EU funded project REASON (IST-2000-30193) a special CMOS integrated circuit named AnaDig has been designed and prototyped. It is intended for use in student labs for experimental investigations of properties of a wide range of components and simple functional blocks in analog CMOS integrated circuits. It allows to make hundreds of various measurements, from the simplest ones up to advanced experiments with more complex blocks.

The expected results of this work include not only methodology and lab equipment design, but also description of examples of experiments to be perfomed in the teaching process.

4.2. Projects Granted by the Ministry of Education and Science

[Pro12] **Design methodology of analog ASICs based on the notion of virtual prototyping** (Metodologia projektowania analogowych układów ASIC oparta na koncepcji wirtualnego prototypowania), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Zbigniew Jaworski, co-workers: Wiesław Kuźmicz, Andrzej Pfiztner, Adam Wojtasik, Elżbieta Piwowarska, Grzegorz Janczyk, Jacek Laskowski, Dominik Kasprowicz, Adam Jarosz, Jerzy Gempel, Stanisław Jeszka, April 2002 - March 2005

The most difficult problems in the design of analog circuits are design optimization and yield maximization. These tasks require statistical simulation and prototypes manufacturing and measuring, what is time consuming and costly. What 's more, commercial simulators do not account for correlation of device parameters so the simulation results are far from realistic ones. The aim of this project is to propose and build a design environment based on idea of virtual prototyping. This system will provide an engineer with the ability to automatically simulate manufacturing process and obtain required circuit characteristics taking into account process disturbance and correlations of device parameters. In addition, the system will allow to build VHDL-AMS models of analog macros.

[Pro13] **Modelling of transport phenomena and electrical characteristics of the MOS and MOS SOI tunnel devices** (Modelowanie zjawisk transportu i charakterystyk elektrycznych przyrządów tunelowych MOS I MOS SOI), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Bogdan Majkusiak, co-workers:, Romuald B. Beck, Jakub Walczak, Aleksander Werbowy, Agnieszka Zaręba, Józef Maciak, Małgorzata Trzaskowska, Kazimierz Dalbiak, Witold Ciemiewski, October 2002 - Januar 2005

The aim of the project is to investigate and describe physical phenomena responsible for operation of MOS and MOS SOI devices with ultrathin gate oxide layers, that operate with the use of tunnelling or resonance tunnelling phenomenon.

[Pro14] **Test vectors generation for digital CMOS integrated circuits based on ststistical 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.

[Pro15] **Extremely shallow (<10nm) silicon inplantation (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 dormation of dielectric layers (gate stacs). 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.

[Pro16] **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 microvia. 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.

[Pro17] **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).

[Pro18] **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), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Robert Paszkiewicz, April 2004 – April 2005

The general multimode operation of CG-DBR/DFB laser is investigated. With the help of semi classical theory, general equations describing the multimode operation, including nonlinear effects related to the saturation, mode competition and spatial hole burning, are derived. In particular, by extracting the time-dependent equations for output power the stability conditions in the case of two-mode operation have been determined.

[Pro19] **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.

[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, Tomasz Grudniewski, 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] **Luminescence properties of epitaxial thin films of YAG:Pr^{3+}** (Właściwości luminescencyjne cienkich, monokrystalicznych warstw epitaksjalnych z YAG:Pr^{3+}), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Michał Malinowski, November 2004 – November 2005

In bulk YAG crystals grown using the Czochralski method the maximum doping concentration by Pr^{3+} ions is limited to about 1.5 at. %, however in the epitaxial films we have obtained much higher concentrations, up to about 10 at. % of praseodymium. The liquid phase epitaxy (LPE) technique has been used for growing Pr:YAG/YAG optical waveguide structures. The creation of active YAG waveguide on YAG substrate requires an increase of refractive index difference between epitaxial layer and substrate. For this purpose the substitution of aluminum by gallium was employed. For high active ion concentration, and in the case of optical waveguiding, much stronger interactions between Pr^{3+} ions could be expected. Three types of multi-ion and multi-photon processes have been studied: the cross-relaxation quenching of visible emission from the $^3P_0$ state of praseodymium, IR to blue-green wavelength up-conversion via the $^1G_4$ state and the visible to ultra-violet 4f5d emission up-conversion. The time evolution of the investigated emissions and the cw spectra dependence on Pr^{3+} concentration were measured and analysed. Cross-relaxation and up-conversion probabilities have been determined in the highly Pr^{3+} doped YAG waveguides.

[Pro22] **The study of durability, optimization of construction and technology of ion argon laser discharge tube with quasi-continuous discharge capillary** (Badanie trwałości oraz optymalizacja konstrukcji i technologii wykonania rury wyładowczej jonowego lasera argonowego z quasi-ciągłą kapilara wyładowczą), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Wojciech Kamiński, November 2004 – November 2005

The purpose of the project is the optimization of construction and technology of ion argon laser discharge tube with quasi-continuous discharge capillary made of silicon carbide in order to increase the durability of discharge tube.

[Pro23] **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. Electrophysical and functional properties of constructed structures will be also investigated.

[Pro24] **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.

[Pro25] **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.

[Pro26] **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.

[Pro27] **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 analyze the thermal budget of both processes and to select the appropriate detector type (p-n junction or Shottky-barrier junction)

[Pro28] **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.

[Pro29] **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.

[Pro30] **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 semicalssical 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.

4.3. Projects Granted by International Institutions

[Pro31] **Researches on metal vapour - noble gas discharges for UV laser generation** (Badania wyładowań w mieszaninach gazów szlachetnych i par metali dla generacji laserowej w obszarze ultrafioletu), Research Institute for Solid State Physics and Optics of the Hungarian Academy of Sciences, Hungary, project leader: Tadeusz M.Adamowicz, co-workers: Krzysztof Dzięciołowski, Wojciech Kamiński, 1998 – 2005

Investigations of several noble gas – metal vapour lasing systems (He/Ne-Cu, He/Ne-Zn, He-Ag, He-Au) operating in IR, visible and UV range, diagnostics of plasma and laser medium parameters, modelling of the discharge parameters.

[Pro32] **PV Centre - Photovoltaic Centre of Competence in Poland** (Fotowoltaiczne Centrum Doskonałości w Polsce), European Commission 5 Framework Programme on RTD (NNE5-2002-00019), project leader: Stanislaw M. Pietruszko, November 2002 – October 2005, SPUB-M.

The Centre of Photovoltaics (PV Centre) in Poland promotes the widespread use of solar photovoltaic (PV) energy as realistic, reliable, and economic energy sources, to encourage the integration of PV energy into Poland's research, economy, and everyday life. The PV Centre serves as a focal point to conduct and stimulate research and demonstration activities; educate and allow students to work on real-world PV solar energy issues; organise expert meetings, workshops, symposia, and conferences; and disseminate information and address environmental issues.

[Pro33] **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.

[Pro34] **SOLTRAIN- Photovoltaic Training Courses in EU Candidate Countries,** project leader: Stanislaw M.Pietruszko, Altener 4.1030/Z/02-67 (ALT-2002-067), February 2003 – January 2005

The main objective of SOLTRAIN is to enlarge the understanding and application of photovoltaic solar electricity power systems in candidate EU member countries through the training courses.

[Pro35] **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.

[Pro36] **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.

[Pro37] **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/

[Pro38] **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 adressed. 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.

4.4. Other Projects

[Pro39] **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 fiber laser is investigated. Single spatial mode laser diode is used as a pump source in double doped Pr^{3+}+Yb^{3+}:ZBLAN upconversion fiber laser. Lasing by upconversion 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 fiber lasers are performed. Experimental work is oriented on the construction and investigation of fiber lasers based on Pr/Yb:ZBLAN glass.

[Pro40] **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 fibers. The components of switch were mathematical modeling 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.

[Pro41] **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 opto electronic components: head, fibers 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] Jarosław Dawidczyk, **Investigations of optical-microwave mixing processes in PIN photodetectors**. (Badanie procesów opto-mikrofalowej przemiany częstotliwości na fotodetektorach PIN), supervisor: Bogdan Galwas, 15 March 2005

[PhD2] Piotr Garbat, **3D objects visualization in virtual reality environment based on data from optical measurement systems. (**Wizualizacja obiektów trójwymiarowych w systemach wirtualnej rzeczywistości, na podstawie danych pozyskanych metodami optycznymi) supervisor: Małgorzata Kujawińska, 17 December 2005

[PhD3] Tomasz Guzdek, **Microelectronic semiconductor devices with chemical sensitive carbon film** (Mikroelektroniczne przyrządy półprzewodnikowe z chemoczułą warstwą węglową), supervisor: Jan Szmidt, 1 March 2005

[PhD4] Grzegorz Janczyk, **Bipolar phenomena in SOI-MOS transistors** (Zjawiska bipolarne w tranzystorach SOI-MOS), supervisor: Wiesław Kuźmicz, 2 February 2005

[PhD5] Agnieszka Zaręba, **Modeling of electrical parameters of bipolar transistors with silicongermanium base** (Modelowanie parametrów elektrycznych tranzystorów bipolarnych z bazą krzemogermanową), supervisor: Lidia Łukasiak, 6 September 2005

5.2. M.Sc. Degrees

[MSc1] Michał Błoński, **Komputerowa wizualizacja propagacji pola elektromagnetycznego w światłowodach planarnych i włókowych,** advisor Piotr Witoński, good

[MSc2] Maja Borowska, **Badanie i analiza konwersji wzbudzenia w kryształach granatu aluminiowo iterbowego domieszkowanego jonami erbu (YbAG:Er3+),** advisor Michał Malinowski, excellent

[MSc3] Paweł Broniszewski, **Optymalizacja warunków pracy jonowego lasera kryptonowego w zakresie promieniowania ultrafioletowego,** advisor Jerzy Kęsik, very good

[MSc4] Ernest Brzozowski, **Pomiary temperatury z wykorzystaniem linii opóźniających z AFP,** advisor Mikołaj Bazun, good

[MSc5] Paweł Chrzanowski, **Adaptacja algorytmów genetycznych do symulatora przyrządów półprzewodnikowych STRES,** advisor Andrzej Pfitzner, good

[MSc6] Piotr Daleszczyk, **Badanie wpływu izotopu 3He na warunki generacji laserowej w kolumnie dodatniej wyładowania w mieszaninach hel - pary cynku,** advisor Tadeusz Adamowicz, very good

[MSc7] Paweł Folaron, **Modelowanie i badanie parametrów gemeracyjnych laserów włóknowych Pr=Yb:ZBLAN z konwersją,** advisor Ryszard Piramidowicz, very good

[MSc8] Wojciech Górka, **Analiza generatora mikrofalowego w układzie transmisyjnym,** advisor Bogdan Galwas, very good

[MSc9] Marcin Iwanowicz, **Moduł generatora AWG zorientowanego na charakteryzację struktur półprzewodnikowych,** advisor Zbigniew Pióro, very good

[MSc10] Marcin Kłoda, **Wyszukiwanie obrazów podobnych w bazie danych zdjęć cyfrowych,** advisor Jerzy Woźnicki, good

[MSc11] Piotr Kopczyński, **Analiza dynamicznej pracy lasera planarnego wykonanego z dwuwymiarowego kryształu fotonowego,** advisor Agnieszka Mossakowska-Wyszyńska, very good

[MSc12] Grzegorz Koślacz, **Głębokie, mokre trawienie krzemu w TMAH dla wytwarzania przyrządów ISFET z kontaktami od spodu (BSC),** advisor Romuald Beck, very good

[MSc13] Paweł Mirowski, **Opracowanie technologii wykonywania połączeń o dużej gęstości dla obwodów elastycznych przy zastosowaniu klejów anizotropowych w postaci folii,** advisor Zbigniew Szczepański, very good

[MSc14] Tomasz Nazaruk, **Analiza generacji promieniowania w laserze F-P wykonanym na bazie 1D kryształu fotonowego,** advisor Agnieszka Mossakowska-Wyszyńska, very good

[MSc15] Grzegorz Nowak, **Metody poprawy adhezji warstwy złota na podłożach dielektrycznych i półprzewodnikowych,** advisor Romuald Beck, good

[MSc16] Jan Pakuła, **Wyznaczanie koncentracji domieszki w warstwach (Al) GaSa, wykrystalizowanych metodą MOVPE,** advisor Agata Jasik, very good

[MSc17] Daniel Paluch, **Stabilizacja częstotliwości generatora VCO z wykorzystaniem ułamkowej pętli PLL,** advisor Jerzy Skulski, very good

[MSc18] Paweł Paszta, **Optymalizacja warunków pracy jonowego lasera argonowego w zakresie promieniowania ultrafioletowego,** advisor Jerzy Kęsik, good

[MSc19] Paweł Rebeniak, **Optymalizacja warunków technologicznych wzrostu warstwy naprężonej w studni kwantowej lasera,** advisor. Agata Jasik, very good

[MSc20] Grzegorz Sierzputowski, **System wspomagania zarządzania rozproszonym projektem inżynierskim,** advisor Mikołaj Baszun, very good

[MSc21] Katarzyna Stankiewicz, **Modelowanie pompowania ładunku w strukturach MOS z kanałem SiGe,** advisor Lidia Łukasiak, very good

[MSc22] Piotr Syryjczyk, **Okno procesu lutowania rozpływowego dla pasty SnAgCu,** advisor Ryszard Kisiel, good

[MSc23] Michał Zyzek, **Rozwiązanie równania Schrodingera dla 2DEG w strukturach MOS SOI,** advisor Jakub Walczak, good

5.3. B.Sc. Degrees

[BSc1] Błażej Amanowicz, **Optymalizacja metody segmentacji konturowej dla obrazów barwnych,** advisor Grzegorz Kukiełka, good

[BSc2] Michał Arciszewski, **Ekstrakcja i obliczanie wartości indukcyjności spiralnych na podstawie topografii układu scalonego,** advisor Elżbieta Piwowarska, fairly good

[BSc3] Artur Baczak, **Analiza charakterystyk statycznych złącz P-N z różnych materiałów,** advisor Andrzej Jakubowski, good

[BSc4] Łukasz Bednarek, **Zagadnienia składowania i wyszukiwania informacji obrazowych w bazie danych ORACLE,** advisor Grzegorz Kukiełka, good

[BSc5] Paweł Bieliński, **Projekt stanowiska do pomiarów mechanicznych właściwości materiałów,** advisor Zbigniew Pióro, fairly good

[BSc6] Dominik Brodowski, **Mikroprocesorowo sterowany czujnik pomiaru kwasowości gleby,** advisor Sławomir Szostak good

[BSc7] Bartłomiej Cholewa, **Kontakty metaliczne dla węglika krzemu,** advisor Jan Szmidt, good

[BSc8] Karol Flont, **Model czujnika z AFP do zdalnego przetwarzania zmian pojemności,** advisor Mikołaj Baszun, good

[BSc9] Michał Hacia, **Projekt pętli fazowej dla mikro-nadajnika RF,** advisor Elżbieta Piwowarska, fairly good

[BSc10] Leszek Janiec, **Modernizacja stanowiska pomiarowego do wzorcowania źródeł promieniowania w bliskiej podczerwieni,** advisor Piotr Warda, good

[BSc11] Mateusz Kawałkiewicz, **Regulowany ogranicznik mocy na pasmo 40 - 900 MHz- projekt i realizacja,** advisor Jerzy Piotrowski, good

[BSc12] Ewa Klimowicz,**Ocena powtarzalności wykonania kontaktów podwyższonych miękkich i twardych technologii flip-chip,** advisor Zbigniew Szczepański, good

[BSc13] Emil Kończak, **Badanie i analiza właściwości najnowszych generatorów liczb pseudolosowych do modelowania zjawisk fizycznych w próżniowych układach technologicznych i pomiarowych,** advisor Piotr Szwemin, good

[BSc14] Karol Korszeń,**Nadajnik optyczny - projekt, wykonanie weryfikacja pomiarowa,** advisor Jerzy Piotrowski, good

[BSc15] Michał Kosson, **Konstrukcja i badanie światłowodowego grubordzeniowego czujnika poziomu cieczy z linearyzacją charakterystyki,** advisor Jerzy Kalenik, good

[BSc16] Marek Lesiak, **System do analizy cyfrowych analizy obrazów mikroskopowych w języku Java,** advisor Jerzy Woźnicki, good

[BSc17] Mariusz Machnik, **Opracowanie technologii montazu o dużej niezawodności dla czujników pomiarowych opartych na strukturach krzemowych,** advisor Zbigniew Szczepański, very good

[BSc18] Dariusz Maj, **Badanie właściwości optyczne cienkich warstw dielektrycznych wytwarzanych metodami plazmowymi TiO_2, Al_2O_3, BN,** advisor Jan Szmidt, good

[BSc19] Arkadiusz Malinowski, **Modelowanie parametrów i charakterystyk statyk, przyrządów opartych o półprzewodni szerokopasmowe,** advisor Andrzej Jakubowski, good

[BSc20] Tomasz Nowak, **Badanie właściwości optycznych warstw diamento-podobnych,** advisor Jan Szmidt, good

[BSc21] Michał Pająk,**Struktury tunelowe z ultra cienkim tlenkiem,** advisor Bogdan Majkusiak, good

[BSc22] Sebastian Pawlak, **Algorytm segmentacji obszarowej przez programowanie dla obszarów barwnych,** advisor Jerzy Woźnicki, fairly good

[BSc23] Paweł Pazderski, **Badania piezorezystywności w cienkich i grubych warstwach rezystywnych pod kątem ich zastosowania w czujnikach odkształceniowych,** advisor Zbigniew Szczepański, very good

[BSc24] Piotr Pływaczewski, **Opracowanie laboratoryjnego stanowiska do pomiarów statycznych charakterystyk,** advisor Jan Gibki, good

[BSc25] Paweł Siemieńczuk, **Ekstrakcja parametrów modeli przyrządów MOS i MOS SOI,** advisor Lidia Łukasiak, good

[BSc26] Tomasz Szabłowski, **Analiza porównawcza pasma modulacji w planaenych laserach DFB i F-P z dwu-wymiarowym kryształem fotonowym,** advisor Agnieszka Mossakowska-Wyszyńska, fairly good

[BSc27] Grzegorz Wąchała, **Automatyczna generacja siatki dyskretyzacyjnej dla symulatora elementów układów scalonych,** advisor Andrzej Pfitzner, good

[BSc28] Grzegorz Wieremiejuk, **Opracowanie metody kompensacji temperatury dla czujnika ciśnienia opartego na przestrzennej strukturze krzemowej,** advisor Zbigniew Szczepański, very good

[BSc29] Paweł Zaremba, **Urządzenie do obrazowania zachowania ogniw foto-woltaicznych,** advisor Stanisław Pietruszko,good

[BSc30] Wojciech Zinka, **Sterownik mikroprocesorowy do maty rehabilitacyjnej,** advisor Sławomir Szostak, 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 B	G.Bano, P.Horvath, L.Csillag, J.Glosik, T.Adamowicz, K.Rozsa	224 nm segmentem hollow-cathode silver ion laser	80	215-219
[Pub2]	Archives of Metallurgy and Materials	R.Kisiel, W.Gąsior, Z.Moser, J.Pstruś, K.Bukat, J.Sitek	Electrical and Mechanical Studies of the Sn-Ag-Cu-Bi and Sn-Ag-Cu-Bi-Sb Lead-Free Soldering Materials	50	1079-1085
[Pub3]	Damond & Related Materials	M.Słapa, J.Szmidt, A.Szczęsny, P.Śniecikowski, W.Czarnacki, M.Dudek, M.Traczyk, A.Werbowy	Ultra-thin nanocrystalline diamond detectors	14	125-128
[Pub4]	Damond & Related Materials	M.Sochacki, R.Łukasiewicz, W.Rzodkiewicz, A.Werbowy, J.Szmidt, E.Staryga	Silicon dioxide and silicon nitride as a passivation and edge termination for 4H-SiC Schottky diodes	14	1138-1141
[Pub5]	Fornal of Electroceramics	M.V.Jacob, J.Mazierska, J.Krupka	Dielectric properties of yttrium vanadate crystals from 15 K to 295 K	15	237-241
[Pub6]	IEEE Transactions on Microwave Theory and Techniques	J.Krupka, M.E.Tobar, J.G.Hartnett, D.Cros, J-M.Le Floch	Extremely high Q-factor Dielectric Resonators for Millimeter Wave Applications	53	702-712
[Pub7]	IEEE Transactions on Microwave Theory and Techniques	S.A.Malyshev, B.A.Galwas, A.L.Chizh, J.Dawidczyk, V.F.Andrievski	Frequency Conversion of Optical Signals in p-i-n Photodiodes	53	439-443
[Pub8]	IEEE Transactions on Microwave Theory and Techniques	O.Schimmer, A.Gluelck, F.Daschner, J.Piotrowski, R.Knoechel	Noncontacting Determination of Moisture Content in Bulk Materials Using Sub-Nanosecond UWB Pulses.	53	2107-2113
[Pub9]	IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control	J.Krupka, A.Ćwikla, M.Mrozowski, R.N.Clarke, M.Tobar	High Q-factor Microwave Fabry-Perot Resonator with Distributed Bragg Reflectors	52, no 9	1443-1451
[Pub10]	Journal of Applied Physics	R.G.Geyer, J.Krupka, B.Riddle, L.A.Boatner	Microwave dielectric properties of single crystal quantum paraelectrics $KTaO_3$ and $SrTiO_3$ at cryogenic temperatures	97, no10, Part 1	104111-104117
[Pub11]	Journal of Crystal Growth	D.A.Pawlak, T.Łukasiewcz, M.Carpenter, M.Malinowski, R.Diduszko, J.Kisielewski	Czochralski crystal growth, microstructure and spectroscopic properties of $PrAlO_3$ perovskite	282	260-269
[Pub12]	Measurements Science and Technology	J.Krupka, Wei-Te Huang, Mean-Jue Tung	Complex Permittivity Measurements of Low Loss Microwave Ceramics Employing Higher Order Quasi TE0np Modes Excited in a Cylindrical Dielectric Sample	16	1014-1020
[Pub13]	Metrologia	A.Calcatelli, M.Niewiński, P.Szwemin	Comparison of the experimental data and the simulation results of backstreaming effect in the continuous gas expansion vacuum standard	42	180-183
[Pub14]	Metrologia	P.Szwemin	Global model of the gas flow in high-vacuum standards	42	176-179
[Pub15]	Microelectronics Reliability	A.Jarosz, A.Pfitzner	Evaluation of parasitic capacitances for interconnection buses crossing in different layers	45	761-765
[Pub16]	Microelectronics Reliability	R.Kisiel, J.Borecki, G.Kozioł, J.Felba	Conductive adhesives for through holes and blind vias metallization	45	1935-1940
[Pub17]	Optics Communications	R.Paszkiewicz, P.Szczepański	Effect of excess-quantum nosie In a one-dimensional photonic crystal laser	245	281-288
[Pub18]	Physica Scripta	K.Leśniewska-Matys,	Nonlinear operation of planar Waveguide	T118	107-110

1 Institute for Scientific Information (Philadelphia, USA)

		A.Mossakowska-Wyszyńska, P.Szczepański	Laser with photonic crystal		
[Pub19]	Physica Scripta	A.Mossakowska-Wyszyńska, P.Czuma, K.Leśniewska-Matys, P.Szczepański	Dynamic Operation of planar Waveguide Laser with 2D Photonic Crystal	T118	111-114
[Pub20]	Physica Status Solidi	W.Gryk, D.Dyl, M.Grinberg, M.Malinowski	High pressure photoluminescence study of Pr^{3+} doped $LiNbO_3$ crystal	No 2	188-191
[Pub21]	Solar Energy Materiale & Solar Cells	A.Patryn, S.M.Pietruszko	Didactic software for solar ells and materiale parameters analysis	87	271-285
[Pub22]	Solid-State Electronics	M.Sochacki, A.Kolendo, J.Szmidt, A.Werbowy	Properties of Pt/4H-SiC Schottky diodes with interfacial layer at elevated temperatures	49	585-590
[Pub23]	Supercond. Sci. Technol.	J.Mazierska, D.Ledenyov, M.V.Jacob, J.Krupka	Precise microwave characterization of MgO substrates for HTS circuits with superconducting post dielectric resonator	18	18-23

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

Number	Journal	Authors	Title	Volume	Pages
[Pub24]	Bulletin of the Polish Academy of Sciences, Technical Sciences	W.Woliński, M.Malinowski, A.Mossakowska-Wyszyńska, R.Piramidowicz, P.Szczepański	Investigation and modelling of rare-earth activated waveguide structures	53 No 2	97-102
[Pub26]	Elektronika	T.Bieniek, R.B.Beck, A.Jakubowski, A.Kudła	Analiza skutków ultrapłytkiej implantacji jonów azotu w plazmie w.cz. (13,56 MHz)	2-3	9-10
[Pub27]	Elektronika	T.Gotszalk, A.Sikora, K.Kolanek, R.Szloch, J.Szmidt, P.Grabiec, I.Rangełow, S.Mitura	Metody mikroskopii pola od mikro- do nanoelektroniki: diagnostyka, wytwarzanie	11	14-18
[Pub28]	Elektronika	M.Jakubowska, J.Kalenik, R.Kisiel	Rezystory molibdenowe - ekonomiczna propozycja dla techniki grubowarstwowej	2-3	64-65
[Pub29]	Elektronika	A.Jarosz, A.Pfitzner	Zależność pojemności pasożytniczych od konfiguracji magistrali połączeń	2-3	22-23
[Pub30]	Elektronika	W.Kamiński, J.Kęsik	Analiza efektu pompowania gazu w jonowych laserach argonowych	2-3	19-21
[Pub31]	Elektronika	R.Kisiel, K.Bukat	Problemy technologiczne i materiałowe zamiany technologii ołowiowych na bezołowiowe w montażu elektronicznym	9	22-25
[Pub32]	Elektronika	R.Kisiel, J.Felba	Ekologiczna elektronika – uwarunkowania materiałowe I technologiczne	12	75-77
[Pub33]	Elektronika	L.Łukasiak, A.Jakubowski	Analiza wpływu parametrów kanału SiGe na charakterystyki C-U kondensatora MOS	2-3	57-58
[Pub34]	Elektronika	R.Mroczyński, M.Cuch, T.Bieniek, R.B.Beck, A.Jakubowski	Stabilność termiczna ultracienkich warstw tlenko-azotków osadzanych metodą PECVD	2-3	62-63
[Pub35]	Elektronika	A.Pfitzner	Dwuwymiarowy model hybrydowy domieszkowania do symulacji statystycznej układów scalonych	2-3	65-66
[Pub36]	Elektronika	A.Sidlarewicz, E.Piwowarska	Automatyzacja wstawiania punktów testowych w układzie cyfrowym	2-3	32-33
[Pub37]	Elektronika	J.Stęszewski, A.Jakubowski	Modelowanie charakterystyk I-U tranzystora MOS na węgliku krzemu (4H-SiC oraz 6H-SiC)	2-3	25-26
[Pub38]	Elektronika	A.Szczęsny, E.Kamińska, A.Piotrowska, J.Szmidt	GaN - materiał do konstrukcji przyrządów pracujących przy wysokich częstotliwościach (HEMT) i w ekstremalnych warunkach	2-3	16-17
[Pub39]	Elektronika	M.Śmietana, J.Szmidt, M.Dudek	Warstwa diamepntopodobna jako obszar czynny dla czujników światłowodowych	2-3	37-38
[Pub40]	Elektronika Praktyczna	R.Kisiel	Nadchodzą: technologie montażu	1	69-71

			bezołowiowego		
[Pub41]	Journal of Telecommunication and Information Technology	T.Bieniek, R.B.Beck, A.Jakubowski, A.Kudła	Ultra-shallow nitrogen plasma implantation for ultra-thin silicon oxynitride (SiO_xN_y) layer formation	1	70-75
[Pub42]	Journal of Telecommunication and Information Technology	P.Firek, A.Werbowy, J.Szmidt, A.Olszyna	Properties of Al. Contacts to Si surface exposed in the course of plasma etching of previously grown nanocrystalline c-BN film	1	76-80
[Pub43]	Journal of Telecommunication and Information Technology	W.Grabiński, D.Tomaszewski, L.Lemaitre, A.Jakubowski	Standardization of the compact model coding: non-fully depleted SOI MOSFET example	1	135-141
[Pub44]	Journal of Telecommunication and Information Technology	R.Kisiel, Z.Szczepański	Trends in assembling of advanced IC packages	1	63-69

6.3. Scientific and Technical Papers Published in Conference Proceedings

Number	Conference	Authors	Title	City, Country	Volume	Pages
[Pub45]	10th IEEE European Test Symposium, 22-25 May 2005	J.Raaik, R.Ubar, J.Sudbrock, W.Kuźmicz, W.Pleskacz	DOT: New Deterministic Defect-Oriented ATPG tool	Tallin Estonia		96-101
[Pub46]	10th Intel Academic Forum 18-20 May 2005	Z.Jaworski	Chip Gallery: ASICs for unusual applications	Gdańsk, Poland		1-4
[Pub47]	10th Intel Academic Forum 18-20 May 2005,	Z.Jaworski	Design for manufacturability: Methodologies and tools	Gdańsk, Poland		1-3
[Pub48]	31st IEEE Conference Record of the Thirty-First IEEE Photovoltaics Specialists	S.Pietruszko	Prospects for photovoltaics in the central and eastern Europe	Lake Beuna Vista, Florida, USA		1753-1756
[Pub49]	31st IEEE Conference Record of the Thirty-First IEEE Photovoltaics Specialists	S.Pietruszko, M.Grądzki	1-KW Grid connected PV system after 3 years of monitoring	Lake Beuna Vista, Florida, USA		1730-1733
[Pub50]	6th IEEE Latin - America Test Workshop - LATW'2005	J.Raik, R.Ubar, J.Sudbrock, W.Kuźmicz, W.Pleskacz	Deterministic Defect-Oriented Test Generation for Combinational Circuits	Salvador, Bahia, Brazylia		325-330
[Pub51]	APMC'2005 Asia-Pacific Microwave Conference Proceedings IEEE	J.Mazierska, M.V.Jacob, D.Ledenyov, J.Krupka	Loss tangent measurements of dielectric substrates from 15K to 300K with two resonators: investigation into accuracy issues	Suzhou, China		5-8
[Pub52]	APMC'2005 Asia-Pacific Microwave Conference Proceedings IEEE	M.V.Jacob, J.Mazierska, J.Krupka	Low temperature complex permittivity of MgF_2 at microwave frequencies from $TE_{01\delta}$ Modes	Suzhou, China		1-4
[Pub53]	CLEO'2005 Europhysics Conference Abstracts	A.Mossakowska-Wyszyńska, K.Leśniewska-Matys, P.Szczepański	Dynamic operation of planar waveguide DBR laser with 1D and 2D photonic crystals	Munich, Germany	29B	CK-15
[Pub54]	CLEO'2005 Europhysics Conference Abstracts	A.Wnuk, J.Sarnecki, M.Kopczyński, L.Młyńczak, Z.Mierczyk, M.Malinowski	Interaction between Nd3+ and Yb3+ ions in epitaxial YAG laser Waveguide	Munich, Germany	29B	CE6-1
[Pub55]	CLEO'2005 Europhysics Conference Abstracts	R.Piramidowicz, M.Klimczak, M.Malinowski	UV and violet emission dynamic in Nd3+ doped fluorozirconate glasses under pulsed IR excitation	Munich, Germany	29B	CE-21
[Pub56]	CLEO'2005 Europhysics Conference Abstracts	T.Łukasiewicz, D.Pawlak, W.Szyrski, R.Diduszko, M.Malinowski	Growth, spectroscopic and laser properties of $Yb:Y(BO_3)_3$ for fast lasers	Munich, Germany		CA-27
[Pub57]	CNI - Ceter of Nanoelectronic Systems	B.Majkusiak, J.Walczak	Silicon resonant tunneling devices - theoretical study	Forschungszentrum Jülich,		83-84

	for Information Technology (Nanoelectronics Days 2005)			Germany		
[Pub58]	EUROSOI'2005 First Workshop of the Thematic Network on Silicon on Insulator Technology, Devices and Circuits	B.Majkusiak	Theoretical investigation of the resonant tunneling currents in the double gate SOI structure	Granada, Spain		63-64
[Pub59]	Int.Conference 4th Nanodiamond and Related Materials jointly with 6-th Diamond and Related Films, 28 June – 1 July 2005	A.Szczęsny, E.Kamińska, A.Piotrowska, K.Gołaszewska, R.Łukasiwicz, R.Mroczyński, J.Szmidt	Ru-Si-O/AIN, Si3N4 Schottky contacts for n-Type GaN and AIGaN	Zakopane, Poland		151
[Pub60]	Int.Conference 4th Nanodiamond and Related Materials jointly with 6-th Diamond and Related Films, 28 June – 1 July 2005	A.Werbowy, P.Firek, A.Olszyna, N.Kwietniewski, J.Szmidt	Plasma sputter deposition and properties of $BaTiO_3$ films	Zakopane, Poland		104
[Pub61]	Int.Conference 4th Nanodiamond and Related Materials jointly with 6-th Diamond and Related Films, 28 June – 1 July 2005	J.Stęszewski, M.Sochacki, A.Jakubowski, J.Szmidt,A.Werbowy	Modeling electrical characteristics of devices on silicon carbide	Zakopane, Poland		144-146
[Pub62]	Int.Conference 4th Nanodiamond and Related Materials jointly with 6-th Diamond and Related Films, 28 June – 1 July 2005	J.Szmidt, A.Szczęsny, M.Sochacki, P.Śniecikowski	Silicon carbide, diamond nitride and diamond as alternative semiconductors for microelectronics	Zakopane, Poland		69
[Pub63]	Int.Conference 4th Nanodiamond and Related Materials jointly with 6-th Diamond and Related Films, 28 June – 1 July 2005	M.Jakubowska, P.Firek, E.Zwierkowska, J.Szmidt, A.Werbowy	Investigation of c-BN thick film layers on silicon substrates	Zakopane, Poland		105
[Pub64]	Int.Conference 4th Nanodiamond and Related Materials jointly with 6-th Diamond and Related Films, 28 June – 1 July 2005	M.Kalisz, R.B.Beck, A.Kudła, P.Konarski	Modification of silicon dioxide properties by RF CF_4 and CF_4:O_2 plasmas	Zakopane, Poland		116-117
[Pub65]	Int.Conference 4th Nanodiamond and Related Materials jointly with 6-th Diamond and Related Films, 28 June – 1 July 2005	M.Mirkowska, E.Dusiński, K.Zdunek, J.Szmidt	Carbon nitride layers obtained by impulse plasma deposition method for electronics applications	Zakopane, Poland		166
[Pub66]	Int.Conference 4th Nanodiamond and Related Materials jointly with 6-th Diamond and Related Films, 28 June – 1 July 2005	M.Sochacki, P.Śniecikowski, J.Szmidt, R.Łukasiewicz, A.Kubiak	Low energy boron implantation in 4H-SiC	Zakopane, Poland		143
[Pub67]	Int.Conference 4th Nanodiamond and Related Materials jointly with 6-th Diamond and Related Films, 28 June – 1 July 2005	P.Firek, R.Mroczyński, J.Szmidt, R.B.Beck, A.Werbowy	Modyfying of Si-CBN interface electrophysical properties by introduction of ultrathin dielectric layer	Zakopane, Poland		106

[Pub68]	Int.Conference 4th Nanodiamond and Related Materials jointly with 6-th Diamond and Related Films, 28 June – 1 July 2005	R.Łukasiwicz, B.Cholewa, M.Sochacki, E.Kamińska, A.Piotrowska, J.Szmidt, E.Dynowska, J.Ratajczak	Characterization of NI-Based low resistivity ohmic contacts on n-Type 4H-SiC	Zakopane, Poland		147
[Pub69]	Int.Conference 4th Nanodiamond and Related Materials jointly with 6-th Diamond and Related Films, 28 June – 1 July 2005	T.Bieniek, R.B.Beck, A.Jakubowski, P.Konarski, M.Cwil, P.Hoffmann, D.Schmeisser	Formation of oxynitride layers in R.F. plasma planar structure Si and SiC MOS structures	Zakopane, Poland		89-90
[Pub70]	Int.Conference 4th Nanodiamond and Related Materials jointly with 6-th Diamond and Related Films, 28 June – 1 July 2005	T.Guzdek, M.Dudek, J.Szmidt, P.Niedzielski	Chemoselectivity of the surface of NCD layer in a sensor applications	Zakopane, Poland		70
[Pub71]	International Congress on Optics and Optoelectronics	K.Leśniewska-Matys, P.Szczepański	Nonlinear operation of phased array Fabry-Perot photonic crystal laser	Warszawa, Poland		5950-44
[Pub72]	ISSE'2005 – 28th UInternational Spring Seminar on Electronics Technology	R.Kisiel, J. Borecki, J.Felba	Electrically Conductive Adhesives as Vias Fill in PCBs: the Influence of Fill Shape and Contact Metallisation on Vias Resistance Stability	Wiener Neustadt, Austria		118-119
[Pub73]	Materiały Konferencji E-Campus	B. Galwas, J.Barczyk, S.Nowak, E.Piwowarska, R.Rak	OKNO– doświadczenia Politechniki Warszawskiej w przygotowaniu i prowadzeniu wirtualnej edukacji	Warszawa, Poland		1 - 9
[Pub74]	Materiały Konferencji Komitetu przy Prezydium PAN	J.Woźnicki	Budowanie kapitału ludzkiego w Polsce. Szanse młodych Polaków w Zjednoczonej Europie	Warszawa, Poland		
[Pub75]	Materiały konferencyjne "Strategia Lizbońska w połowie drogi – szanse dla uczelni akademic-kich", 13 December '05	J.Woźnicki	Zadania polskich szkół wyższych w realizacji nowej Strategii Lizbońskiej – problemy praktyczne			85–90
[Pub76]	Materiały konferencyjne konferencji "Dylematy studiów dwustopniowych"	J.Woźnicki	"Studia trójstopniowe – europejski i polski wybór	Łódź, Poland		
[Pub77]	Materiały V Konferencji „Uniwersytet Wirtualny"	B.Galwas, R.Rak,'A.Woźniak	Model międzywydziałowych uzupełniających studiów magisterskich przez Internet	Warszawa, Poland		1 - 7
[Pub78]	MICROTHERM'2005 International Conference Microtechnology and Thermal Problems in Electronics	A.Szczęsny, E.Kamińska, A.Piotrowska, K.Gołaszewska, R.Łukasiewicz	AlGaN/GaN HEMT for High Temperature Applications – Thermally Stable Shottky Contacts Formation	Łódź, Poland		14-18
[Pub79]	MICROTHERM'2005 International Conference Microtechnology and Thermal Problems in Electronics	T.Guzdek, J.Szmidt, M.Dudek, P.Niedzielski	NCD Layers as Material for Chemosensitive Structures Operated in High Ambient Temperature	Lódź, Poland		9-13
[Pub80]	OSA'2005 Frontiers In Optics/ Laser Science Conferences	A.Rudziński, A.Tyszka-Zawadzka, P.Szczepański	Simple model of spontaneous emission in 1D photonic crystal	Tucson, Arizona		433
[Pub81]	Photonics West Showcasing the Age of	K.Leśniewska-Matys, P.Sczepański	Model of phase array laser structure in 2D photonic	San Jose, California,		5733-75

	Light (SPIE)		crystals	USA		
[Pub82]	Photonics West Showcasing the Age of Light (SPIE)	R.Paszkiewicz, P.Szczepański	Multimode operation of circular-grating distributed Bragg reflector laser	San Jose, California, USA		5737-23
[Pub83]	POLYTRONIC'2005 - 5th International Conference on Plymers and Adhesives in Microelectronics and Photonics	R.Kisiel, J.Felba, J.Borecki, A.Mościcki	Problems of PCB Microvias Filling by Conductive Paste	Wrocław, Poland		96 - 101
[Pub84]	Proc. of the 12th Int.Conference: "Mixed Design of Integrated Circuits and Systems MIXDES June 2005	A.Jarosz, A.Pfitzner	Calibration of the interconnection capacitance models in hybrid statistical simulation of IC'S	Kraków, Poland		305-308
[Pub85]	Proc. of the 12th Int.Conference: "Mixed Design of Integrated Circuits and Systems MIXDES June 2005	A.Kuleshov, W.Kuźmicz, V.Nelayev, V.Stempitsky	Physical simulation and statistical analysis of IC technology.	Kraków, Poland		971-974
[Pub86]	Proc. of the 12th Int.Conference: "Mixed Design of Integrated Circuits and Systems MIXDES June 2005	A.W.Łuczyk, W.A.Pleskacz	Bi-Directtional Differential On-Chip Bus	Kraków, Poland		65-70
[Pub87]	Proc. of the 12th Int.Conference: "Mixed Design of Integrated Circuits and Systems MIXDES June 2005	D.Kasprowicz	Modeling of the impact of transistor gate length variations on clock skew in buffered H-trees	Kraków, Poland		345-350
[Pub88]	Proc. of the 12th Int.Conference: "Mixed Design of Integrated Circuits and Systems MIXDES June 2005	D.Tomaszewski, L.Łukasiak, S.Magierowski, K.Iniewski	2-D Numerical Modeling of MOFSET Varactors for Application in High-Speed Voltage Controlled Oscillators	Kraków, Poland		873-876
[Pub89]	Proc. of the 12th Int.Conference: "Mixed Design of Integrated Circuits and Systems MIXDES June 2005	W.Jońca, W.Kuźmicz	Application of the evolution strategy to analysis of electronic circuits	Kraków, Poland		297-300
[Pub90]	Proc. of the 2005 IEEE International Conference on Microelectronic Systems Education – MSE June 2005	W.A.Pleskacz, T.Borejsko, T.Gugala, P.Pizon, V.Stopjakova	DefSim - the Educational Integrated Circuit for Defect Simulation	Anaheim, California, USA		121-122
[Pub91]	Proceedings 8th EUROMICRO Conference on Digital System Design, 30 August - 3 September 2005	J.Sudbrock, J.Raik, R.Ubar, W.Kuźmicz, W.Pleskacz	Defect-Orieted Test- and Layout-Generation for Standard-Cell ASIC Designs	Porto, Portugalia		79 - 82
[Pub92]	Proceedings of SPIE, Liquid Crystals: Optics and Applications	T.Grudniewski, J.Parka, E.Nowinowski	Influence of LC cell layers modifications on diffraction efficiency and the memory effect	Bellingham, USA	5947	17-1 - 17-4
[Pub93]	Proceedings of SPIE: Lasers and Applications	R.Piramidowicz, M.Klimczak, M.Malinowski	Analysis of multi-photon pumping schemes for Nd:ZBLAN fiber laser operating in the UV and violet	Bellingham, USA	5958	680-689
[Pub94]	Proceedings of SPIE: Lasers and Applications	R.Piramidowicz, P.Folaron, P.Witoński, M.Klimaczak, M.Malinowski	Modelling and optimization of Pr+Yb doped ZBLAN up-conversion fiber laser	Bellingham, USA	5958	700-705
[Pub95]	Proceedings of SPIE:	P.Czuma, P.Szczepański	Analytical model of one	San Jose,	5723	307-315

	Optical Components and Materiale II, 24 - 25 January 2005		dimensional SiO_2:Er doped photonic crystal Fabry-Perrot laser – semiclassical approach	California		
[Pub96]	Proceedings of SPIE: Optical Components and Materials II, 24 - 25 January 2005	A.Mossakowska-Wyszyńska, P.Szczepański	Dynamic operation of 1D photonic crystal Nd:YAG laser	San Jose, California	5723	324-333
[Pub97]	Proceedings of SPIE: Optical Fibers: Application	M.Borecki	The fiber optic sensor with D type head synthesis	USA	5952	324-328
[Pub98]	Proceedings of SPIE: Optical Fibers: Application	M.Borecki	Fiber optic vibration sensor: identification of micro-mechanical components' parameters	Bellingham, USA	5952	329-333
[Pub99]	Proceedings of SPIE: Optical Fibers: Application	M.Borecki, J.Kruszewski	Skew radiation in optical fiber: the proposal of share measure	Bellingham, USA	5952	334-339
[Pub100]	Proceedings of SPIE: Optical Materials and Applications	S.Pietruszko, A.Mikołajuk	Photovoltaic research and development in EU New Member and Candidate States	Bellingham, USA	5946	252-257
[Pub101]	Proceedings of SPIE: Optics and Optoelectronics	P.Wrzosek, M.Borecki, J.Kruszewski	Threshold effect in optical amplifiers: modelling and verification	Bellingham, USA	5952	340-347
[Pub102]	Proceedings of SPIE: Photonic Crystals and Fibers	A.Mossakowska-Wyszyńska, P.Czuma, P.Szczepański	Relaxation oscillation of planar waveguide DBR laser with 1D photonic crystal	Bellingham, USA	5950	19-1 – 19-10
[Pub103]	Proceedings of SPIE: Photonic Crystals and Fibers	A.Rudziński, A.Tyszka-Zawadzka, P.Szczepański	Simple model of the density of states in 1D photonic crystal	Bellingham, USA	5950	1A-1 – 1A-8
[Pub104]	Proceedings of SPIE: Photonic Crystals and Fibers	K.Leśniewska-Matys, P.Szczepański	Nonlinear operation in pahsed array Fabry-Perot photonic crystal laser	Bellingham, USA	5950	17-1 – 17-5
[Pub105]	Proceedings of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments III	M.Borecki	The correctness of intensity methods based on monte carlo scheme with example of the light coupling from source to optical fiber	Bellingham, USA	5775	186-192
[Pub106]	Proceedings of SPIE: Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments III	M.Borecki, P.Wrzosek, J.Kruszewski	Opto-electronics and electro-optics intensity converters models	Bellingham, USA	5775	446-450
[Pub107]	Proceedings of the 15th International Travelling Summer School on Microwaves and Lightwaves	B.Galwas	Microwave Photonics	L'Aquila, Italy		1-54
[Pub108]	Proceedings of the 15th International Travelling Summer School on Microwaves and Lightwaves	P.Szczepański	Photonic crystals	L'Aquila, Italy		1-10
[Pub109]	Proceedings of the 29th International Conference on Advanced Ceramics and Composites	M.V.Jacob, J.Mazierska, J.Krupka	Microwave characterisation of calcium fluoride in the temperature range 15-300K	Cocoa Beach, Floryda	26	161-168
[Pub110]	Twentieth European Photovoltaic Solar Energy Conference	I.Arzberger, A.Claverie, C.Diamanti, M.Gutschner, M. Hall, M.Hübner, M.Montes Pone de León,	PV-ERA-NET – A Programmers' Approach to Strengthen Europe's Position in OV Research and	Barcelona, Spain		2883-2885

		K.Newell, S,Nowak, S.Pietruszko	Technology			
[Pub111]	Twentieth European Photovoltaic Solar Energy Conference	S.Pietruszko, et. al.	Evaluating the state of the art of photovoltaic performance modelling in Europe	Barcelona, Spain		1937-1941
[Pub112]	Twentieth European Photovoltaic Solar Energy Conference	S.Pietruszko, et. al.	Recommendations for PV development in the European Union new member and candidate states	Barcelona, Spain		2886-2889
[Pub113]	Twentieth European Photovoltaic Solar Energy Conference	S.Pietruszko, W.Hoffmann	Feed-in: the most effective market support programe	Barcelona, Spain		3095-3098
[Pub114]	„Vacuum Based Science and Technology" Joint Meeting of the German Vacuum Society and the Polish Vacuum Society	P.Szwemin	Zarys historii techniki wysokiej próżni w Polsce	Kraków, Poland		54-70
[Pub115]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	A.Calcatelli, M.Niewiński, P.Szwemin	Porównanie wpływu strumienia wstecznego na generowaną koncentrację gazu w systemie wzorca IMGC wyznaczonego na drodze pomiaru i symulacji Monte-Carlo.	Stare Jabłonki, Poland		707-710
[Pub116]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	A.Jarosz. A.Pfitzner	Dependence of parasitic capacitances on interconnection buses configuration	Stare Jabłonki, Poland		345-348
[Pub117]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	A.Linkowski, L.Łukasiak, A.Jakubowski	Modelowanie wpływu parametrów tranzystora HBT z bazą SiGe na prędkość nośników w bazie przy użyciu symulatora APSYS 2000	Stare Jabłonki, Poland		365-368
[Pub118]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	A.Mossakowska-Wyszyńska, A.Getka, P.Szczepański	Numerical simulation of 2D photonic crystal laser operation	Stare Jabłonki, Poland		571-575
[Pub119]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	A.Pfitzner	Dwuwymiarowy model hybrydowy domieszkowania dla symulacji statystycznej układów scalonych	Stare Jabłonki, Poland		421-424
[Pub120]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	A.Sidlarewicz, E.Piwowarska	Automatyzacja wstawiania punktów testowych w układzie cyfrowym	Stare Jabłonki, Poland		441-444
[Pub121]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	A.Szczęsny, E.Kamińska, A.Piotrowska, J.Szmidt	GaN - Materiał dla konstrukcji przyrządów pracujących przy wysokich częstotliwościach (HEMT) i w ekstremalnych warunkach	Stare Jabłonki, Poland		221-223
[Pub122]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	A.Zaręba, L.Łukasiak, A.Jakubowski	Modeling of energy band diagram and junction capacitance of HBT transistor with graded sige base	Stare Jabłonki, Poland		479-482
[Pub123]	VIII Krajowa	A.Zaręba, L.Łukasiak,	The importance of the carrier	Stare Jabłonki,		483-486

	Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	A.Jakubowski	velocity saturation in the base on the modeling of SIGE-BASE HBT	Poland		
[Pub124]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	B.Majkusiak	Przyrządy elektroniki pojedynczego elektronu	Stare Jabłonki, Poland		297-307
[Pub125]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	B.Majkusiak, J.Walczak	Study of resonant tunnelin of elctrons in the silicon DG MOS transistor	Stare Jabłonki, Poland		397-401
[Pub126]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	B.Pura, Z.Mączeński, G.Ratusznik	Photonic modulation on plymer waveguides	Stare Jabłonki, Poland		567-570
[Pub127]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	E.Piwowarska	Problemy czasowe w technologiach VLSI	Stare Jabłonki, Poland		433-436
[Pub128]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	G.Janczyk	New look on SOI body effects	Stare Jabłonki, Poland		341-344
[Pub129]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	J.Gibki, L.Łukasiak, A.Jakubowski	Pomiary tranzystorów SiGe w niskich temperaturach	Stare Jabłonki, Poland		333-336
[Pub130]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	J.Stęszewski, A.Jakubowski	Modeling I-V characteristics of 4H-SiC and 6H-SiC MOSFETs	Stare Jabłonki, Poland		445-448
[Pub131]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	J.Walczak, B.Majkusiak	Phonon-Limited Electron Mobility in Ultrathin Double-Gate Strained-Si/Si(1-x)Gex/Strained-Si Field effect Transistor	Stare Jabłonki, Poland		487-490
[Pub132]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	J.Żelazko, J.Szmidt, W.Gębicki	Influence of technological parameters of plasma deposition on property of dielectric carbon layers	Stare Jabłonki, Poland		253-257
[Pub133]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	K.Leśniewska-Matys, P.Szczepański	A simple model of gain saturation of planar waveguide laser manufactured on the base of photonic crystal with 2D photonic bandgap	Stare Jabłonki, Poland		605-608
[Pub134]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	L.Łukasiak, A.Jakubowski	Investigation of the influence of SiGe channel parameters on the CV characteristics of a MOSCAP	Stare Jabłonki, Poland		377-380
[Pub135]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	L.Łukasiak, A.Jakubowski	Modeling CV characteristics of a MOS structure with strained-Si channel	Stare Jabłonki, Poland		389-392

[Pub136]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	L.Łukasiak, A.Jakubowski, D.Tomaszewski	Modeling I-V characteristics of a p-MOSFET with a SiGa channel	Stare Jabłonki, Poland		381-384
[Pub137]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	L.Łukasiak, A.Jakubowski, D.Tomaszewski	Modeling MOS Capactor with SiGe Gate	Stare Jabłonki, Poland		385-388
[Pub138]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	L.Łukasiak, A.Jakubowski, R.B.Beck, Z.Pióro	Krzemogerman (SiGe) w mikroelektronice	Stare Jabłonki, Poland		289-296
[Pub139]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	L.Łukasiak, J.Grabowski, P.Nowek, K.Stankiewicz, R.B.Beck, A.Jakubowski	Controller for muti-step technological processes	Stare Jabłonki, Poland		373-376
[Pub140]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	M.Jakubowska, J.Kalenik, R.Kisiel	Rezystory molibdenowe - ekonomiczna alternatywa dla techniki grubowarstwowej	Stare Jabłonki, Poland		137-140
[Pub141]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	M.Słapa, A.Szczęsny, P.Śniecikowski, J.Szmidt, W.Czarnacki, M.Traczyk, M.Dudek	Nanocrystalline diamond films for detector apllications	Stare Jabłonki, Poland		233-236
[Pub142]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	M.Śmietana, J.Szmidt, M.Dudek	Warstwa diamentopodobna jako obszar czynny dla czujników światłowodowych	Stare Jabłonki, Poland		259-262
[Pub143]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	M.Sochacki, R.Łukasiewicz, J.Szmidt, W.Rzodkiewicz, M.Leśko, M.Wiatroszak	Warstwy termicznego SiO2 i Si3N4 na węgliku krzemu (4H-SiC) dla przyrządów mocy MS i MIS	Stare Jabłonki, Poland		209-212
[Pub144]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	P.Czuma, P.Szczepański	Semiclassical theory of 1D photonic crystal laser	Stare Jabłonki, Poland		535-540
[Pub145]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	P.Firek, A.Werbowy, P.Konarski, J.Szmidt. A.Olszyna	Właściwości elektryczne warstw nanokrystalicznego c_BN w podwyższonych temperaturach	Stare Jabłonki, Poland		93-96
[Pub146]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	P.Szwemin	Wpływ płytki blokującej na rozkłady gęstości strumienia gazu na ścianie komory wzorca próżni z dynamiczną ekspansją gazu	Stare Jabłonki, Poland		735-739
[Pub147]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	P.Wrzosek, M.Borecki, J.Kruszewski	Functional spice model of fiber amplifier	Stare Jabłonki, Poland		617-620
[Pub148]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa"	R.B.Beck, P.Grabiec, R.Paszkiewicz	Krzem i jego związki - nieklasyczne zastosowania	Stare Jabłonki, Poland		41-48

	ELTE'2004					
[Pub149]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	R.Kisiel	Wpływ temperatury lutowania na rozpływność lutów SnAg i SnAgCu na różnych podłożach	Stare Jabłonki, Poland		141-143
[Pub150]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	R.Kisiel, J.Felba	Ekologiczna elektronika - uwarunkowania materiałowe i technologiczne	Stare Jabłonki, Poland		49-56
[Pub151]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	R.Mroczyński, M.Cuch, T.Bieniek, R.B.Beck, A.Jakubowski	Stabilność termiczna ultracienkich warstw tlenko-azotków osadzanych metodą PCVD	Stare Jabłonki, Poland		325-328
[Pub152]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	R.Paszkiewicz, P.Szczepański	Semi-classcal theory of circular-grating distributed-feedback laser	Stare Jabłonki, Poland		609-612
[Pub153]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	S.Szostak, L.Łukasiak, R.B.Beck, A.Jakubowski	Charakteryzacja tranzystorów MOS z kanałem SiGe metodą pompowania ładunku	Stare Jabłonki, Poland		449-452
[Pub154]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	S.Szostak, R.B.Beck, L.Łukasiak, A.Jakubowski	Zastosowanie metosy pompowania ładunku do charakteryzacji struktur MIS z ultracienką warstwą Si_3N_4	Stare Jabłonki, Poland		453-456
[Pub155]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	T.Bieniek, R.B.Beck, A.Jakubowski, A.Kudła	Analiza skutków ultrapłytkiej implantacji jonów azotu w plaźmie w.cz. (13,56 MHz)	Stare Jabłonki, Poland		69-72
[Pub156]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	T.Bieniek, R.B.Beck, A.Jakubowski, A.Kudła	Wytwarzanie ultracienkich warstw SiO_2 za pomocą niskotemperaturowego utleniania w plaźmie w.cz.	Stare Jabłonki, Poland		329-332
[Pub157]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	T.Guzdek, J.Szmidt, P.Niedzielski, M.Dudek	Warstwy NCD jako chemoczułe dielektryki bramkowe w strukturach OpenGateFET	Stare Jabłonki, Poland		117-120
[Pub158]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	T.Łuba, E.Piwowarska, Z.Jaworski	Rekonfigurowalne systemy scalone (system-on-a-Programmable-Chip)	Stare Jabłonki, Poland		309-316
[Pub159]	VIII Krajowa Konferencja Naukowa "Technologia Elektronowa" ELTE'2004	W.Kamiński, J.Kęsik	Analiza efektu pompowania gazu w jonowych laserach argonowych	Stare Jabłonki, Poland		545-549
[Pub160]	Wydawnictwo Stowarzyszenia Wychowanków PW	B.Galwas	Edukacja inżyniera w dobie Internetu	Warszawa, Poland		1 - 11
[Pub161]	XI Krajowe Sympozjum Nauk Radiowych URSI 2005	W.Matuszewski, M.Baszun	System pomiarowy charakterystyk częstotliwościowych linii opóźniających z AFP	Poznań, Poland		351-353
[Pub162]	XVI IEEE-SPIE	M.Klimczak, P.Witoński,	Modelling of short-wavelenght	Wilga, Poland		7

	Symposium on Photonics, Electronics and Web Engineering	A.Ryter, R.Piramidowicz	operation of Nd^{3+} doped fluorozirconate glass fiber laser			
[Pub163]	XVI IEEE-SPIE Symposium on Photonics, Electronics and Web Engineering	P.Folaron, R.Piramidowicz	Theoretical model for analysis of multi-photon pumping efficiency in praseodymium doped fiber lasers	Wilga, Poland		8
[Pub164]	XXIX International Conference of IMAPS Poland Chapter, 19-21 September 2005	M.Jakubowska, J.Kalenik, E.Zwierkowska, R.Kisiel, A.Młożniak, K.Kiełbasiński	Lead-free solder joints in thick film hybrid circuits	Koszalin-Darłówko, Poland		95-98
[Pub165]	XXIX International Conference of IMAPS Poland Chapter, 19-21 September 2005	M.Śmietana, J.Kalenik, J.Szmidt, J.Grabarczyk	Integrated planar optical waveguide system with diamond-like carbon film as a sesnsing layer	Koszalin Darłówko, Poland		341-344
[Pub166]	XXIX International Conference of IMAPS Poland Chapter, 19-21 September 2005	R.Kisiel, A.Mościcki, J.Felba, J.Borecki	Technological aspects of applying adhesives in small diameter vias	Koszalin-Darłówko, Poland		99-102
[Pub167]	XXIX International Conference of IMAPS Poland Chapter, 19-21 September 2005	Z.Szczepański, P.Mirowski, J.Kalenik	Anisotropic conductive films for flexible circuits assembly application	Koszalin Darłówko, Poland		111-114

6.4. Scientific and Technical Books

Number	Authors	Publisher	Title, volume, pages
[Pub168]	P.Firek, A.Werbowy, J.Szmidt, P.Konarski, A.Olszyna	J. Lee and N. Novikov (eds.) Springer, Printed in the Netherlands	Innovative superhard Materials and Sustainable Coatings for Advanced Manufacturing: Influence of the Temperature on Electronic Properties of Carbon-Rich BN Films Obtained from $(C_2H_5)3B$ by Means of Reactive Pulse Plasma Method, 6p.
[Pub169]	P.Garbat	Oficyna Wydawnicza Politechniki Warszawskiej	Wizualizacja obiektów trójwymiarowych w systemach wirtualnej rzeczywistości, na podstawie danych pozyskanych metodami optycznymi 124p
[Pub170]	B.Majkusiak, J.Walczak	D. Flandre et al. (eds.) Kluwer Academic Publishers, Printed in the Netherlands	Science and Technology of Semiconductor-On-Insulator Structures and Devices Operating in a Harsh Environment: Theoretical Limit for the SiO_2 Thickness in Silicon MOS Devices, 12p.
[Pub171]	M.Niewiński	Oficyna Wydawnicza Politechniki Warszawskiej	Prace Naukowe Politechniki Warszawskiej – Elektronika: Analiza wpływu geometrii płytki blokującej komory pompowej na rozkłady gęstości strumienia gazu we wzorcu niskich ciśnień, p. 146-151
[Pub172]	O.Novak, E.Gramatova, R.Ubar, W.Plaskacz, M.Fischerova	Czech Technical University Publishing House,Czech Republic	Handbook of testing electronic systems: DEFECTS, FAULTS, FAULT MODELS – fault models At the logical and high levels for logic, memories, PLA and microprocessors, defects characterization, 29p.
[Pub173]	S.Pietruszko	Springer, Printed in the Netherlands	Nanostructured and Advanced Materials: Photovoltaics in the world, 10p.
[Pub174]	W.Pleskacz, V.Stopjakova, Z.Plisa, O.Novak	Czech Technical University Publishing House,Czech Republic	Handbook of testing electronic systems: The educational integrated circuits, 6p.
[Pub175]	J.Szmidt	Oficyna Wydawnicza Politechniki Warszawskiej	Technologie diamentowe – diament w elektronice, 152p.
[Pub176]	P.Szwemin	Oficyna Wydawnicza Politechniki Warszawskiej	Prace Naukowe Politechniki Warszawskiej - Elektronika : Jak charakteryzować wysokie próżnie? p. 141-145
[Pub177]	P.Szwemin	Oficyna Wydawnicza Politechniki Wrocławskiej	Polska elektronika próżniowa wczoraj i dziś: Zarys historii techniki wysokiej próżni w Polsce, 19
[Pub178]	M.Śmietana, J.Szmidt, M.Dudek	J. Lee and N. Novikov (eds.) Springer, Printed in the Netherlands	Innovative superhard Materials and Sustainable Coatings for Advanced Manufacturing: Application of Diamond-Like Carbon Film Optical Waveguide Sensing System, 7p.

7. REPORTS

[Rep1] **Analysis of angiogenesis – methods and tools development** (Analiza procesu angiogenezy – rozwój metod i narzędzi algorytmicznych), project leader: Hanna Górkiewicz-Galwas

[Rep2] **Analysis of detection limit of steam saturation in power boiler exhaust by microwave measurement methods** (Analiza wykrywalności metodami mikrofalowymi stopnia nasycenia pary wodnej w spalinach kotłów energetycznych), project leader: Bogdan Galwas

[Rep3] **Analysis of microwave-optical frequency conversion processes on PIN photodiodes** (Badanie procesów optomikrofalowej przemiany częstotliwości na fotodetektorach PIN), project leader: Bogdan Galwas

[Rep4] **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

[Rep5] **Analysis of working conditions and investigations of dielectric laser micro-structures obtained by ion implantation** (Analizy warunków pracy i badanie planarnych mikrostruktur laserowych wytwarzanych metodą implantacji jonów), project leader: Michał Malinowski

[Rep6] **Automation and computerization of laboratory experiments** (Automatyzacja i komputeryzacja eksperymentów laboratoryjnych), project leader: Bogdan Galwas

[Rep7] **Design methodology of analog ASICs based on the notion of virtual prototyping** (Metodologia projektowania analogowych układów ASIC oparta na koncepcji wirtualnego prototypowania), project leader: Zbigniew Jaworski

[Rep8] **Design of low power CMOS integrated circuits with application to control unit for implantable cardioverter defibrillator** (Projektowanie układów scalonych CMOS bardzo małej mocy, z przykładem zastosowania do sterowania wszczepilanym defibrylatorem), sub-project leader: Wiesław Kuźmicz

[Rep9] **Developing of microwave measurement computer controlled system idea** (Opracowanie koncepcji mikrofalowego systemu pomiarowego sterowanego przez komputer), sub-project leader: Bogdan Galwas

[Rep10] **Diamond-like carbon films in optical waveguide sensing techniques** (Warstwy diamentopodobne w światłowodowej technice czujnikowej), project leader: Jan Szmidt

[Rep11] **Digital image analysis and processing of polarized images** (Analiza obrazów spolaryzowanych metodą przetwarzania cyfrowego), sub-project leader: Jearzy Woźnicki

[Rep12] **Elaboration of upconversion fiber laser for visible wavelengths** (Opracowanie i wykonanie modułu lasera włóknowego na zakres widzialny z konwersją wzbudzenia), project leader: Michał Malinowski

[Rep13] **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

[Rep14] **Extremely shallow (<10nm) silicon inplantation (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: R.B. Beck

[Rep15] **Formation and characterization of structures with ultrathine SiO_xN_4 layers on containing SiGe substrates** (Wytwarzanie i charakteryzacja struktur z ultracienką warstwą SiO_xN_4 na podłożach zawierających warstwy SiGe), sub-project leader: Romuald B. Beck

[Rep16] **High Q-factor microwave resonators – new technologies and measurements of dielectric properties of spherical samples** (Nazwa tematu: Rezonatory mikrofalowe o dużej dobroci – nowe technologie i metody pomiaru), sub-project leader: Jerzy Krupka

[Rep17] **Lead –free solder joints in thick film hybrid circuits – investigation of some chosen properties** (Bezołowiowe połączenia lutowane w grubowarstwowych układach hybrydowych - badanie wybranych właściwości), sub-project leader: Jerzy Kalenik

[Rep18] **Luminescence properties of epitaxial thin films of YAG:Pr^{3+}** (Właściwości luminescencyjne cienkich, monokrystalicznych warstw epitaksjalnych z YAG:Pr^{3+}), project leader: Michał Malinowski

[Rep19] **Method of measurements of the very-low frequency relaxation properties of bio-materials in suspensions and solutions** (Metoda badania niskoczęstotliwościowych właściwości relaksacyjnych biomateriałów w roztworach), project leader: Zdzisław Mączeński

[Rep20] **Modeling of electrical characteristics of SiC devices** (Modelowanie charakterystyk elektrycznych przyrządów wytwarzanych na węgliku krzemu), project leader: Aleksander Werbowy

[Rep21] **Modelling and investigation of waveguide laser structures for visible wavelengths** (Modelowanie i badanie falowodowych struktur laserowych na zakres widzialny), sub-project leader: Michał Malinowski

[Rep22] **Modelling and synthesis of optical asymmetric couplers (**Modelowanie i synteza światłowodowych sprzęgaczy asymetrycznych), project leader: Michał Borecki

[Rep23] **Modelling of transport phenomena and electrical characteristics of the MOS and MOS SOI tunnel devices** (Modelowanie zjawisk transportu i charakterystyk elektrycznych przyrządów tunelowych MOS I MOS SOI), project leader: Bogdan Majkusiak

[Rep24] **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

[Rep25] **Optimization of construction, technology and work conditions of ion laser for operation in ultraviolet range** (Optymalizacja konstrukcji, technologii i warunków pracy lasera jonowego w zakresie promieniowania ultrafioletowego), project leader: Jerzy Kęsik

[Rep26] **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

[Rep27] **PV Centre - Photovoltaic Centre of Competence in Poland** (Fotowoltaiczne Centrum Doskonałości w Polsce), European Commission 5 Framework Programme on RTD (NNE5-2002-00019), project leader: Stanislaw M. Pietruszko

[Rep28] **PV Enlargement – Technology Transfer, Demonstration and Scientific Exchange Action for the Establishment of a strong European PV Sector,** project leader: Stanislaw M. Pietruszko

[Rep29] **Researches on metal vapour - noble gas discharges for UV laser generation** (Badania wyładowań w mieszaninach gazów szlachetnych i par metali dla generacji laserowej w obszarze ultrafioletu), project leader: Tadeusz M.Adamowicz

[Rep30] **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

[Rep31] **Shallow carbon implantation into silicone substrate for fast microelectronics technology needs** (Płytka implantacja węgla do krzemu na potrzeby technologii szybkiej mikroelektroniki), project leader: Jan Szmidt

[Rep32] **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

[Rep33] **Software for design of low loss SAW devices** (Opracowanie oprogramowania do projektowania niskostratnych podzespołów elektronicznych z akustyczną falą powierzchniową), project leader: Jerzy Krupka

[Rep34] **Software for the system of MIS structure characterization by means of charge pumping** (Oprogramowanie systemu do charakteryzacji struktur MIS metodą pompowania ładunku), project leader: Sławomir Szostak

[Rep35] **SOLTRAIN- Photovoltaic Training Courses in EU Candidate Countries,** project leader: Stanislaw M.Pietruszko, Altener 4.1030/Z/02-67 (ALT-2002-067)

[Rep36] **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

[Rep37] **Test vectors generation for digital CMOS integrated circuits based on ststistical analysis of manufacturing defects** (Generacja wektorów testowych dla cyfrowych układów scalonych CMOS wykorzystująca statystyczną analizę defektów produkcyjnych), project leader: Witold Pleskacz

[Rep38] **The development of the sectional SSOI-MOS simulation model** (Rozwój modelu sekcyjnego tranzystorów SSOI-MOS), project leader: Grzegorz Janczyk

[Rep39] **The investigation of high vacuum standards properties with use of simulation methods** (Badania parametrów wzorców wysokich próżni metodami symulacyjnymi), sub-project leader: Piotr Szwemin

[Rep40] **The sensor module study and realization for measurement of vibration** (Opracowanie i wykonanie modułu czujnika do pomiaru wibracji), project leader: Jerzy Kruszewski

[Rep41] **The study of durability, optimization of construction and technology of ion argon laser discharge tube with quasi-continuous discharge capillary** (Badanie trwałości oraz optymalizacja konstrukcji i technologii wykonania rury wyładowczej jonowego lasera argonowego z quasi-ciągłą kapilara wyładowczą), project leader: Wojciech Kamiński

[Rep42] **Thematic Network on Silicon on Insulator Technology, Devices and Circuits - Coordination Action EUROSOI,** project leader: Bogdan Majkusiak

[Rep43] **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. CONFERENCES, SEMINARS AND MEETINGS

8.1. International Conferences

[Con1] **12th International Conference: "Mixed Design of Integrated Circuits and Systems MIXDES'2005,** Kraków Poland, June 22 – 25
participants: Lidia Łukasiak, Wiesaw Kuźmicz, Andrzej Pfitzner, Witold Pleskacz, Arkadiusz Łuczyk, Włodzimierz Jońca, Adam Jarosz, Dominik Kasprowicz

[Con2] **15th Photovoltaic Science and Engineering Conference and Exhibition,** Shanghai, China, October 8 – 16
participant: Stanisaw Pietruszko

[Con3] **1st Workshop of the Thematic Network on Silicon on Insulator Technology EUROSOI'2005,** Granada, Spain, January 19 – 21
participant: Bogdan Majkusiak

[Con4] **29th International Conference on Advanced Ceramics and Composites,** Cocoa Beach, Florida, USA, January 23 – 28
participant: Jerzy Krupka

[Con5] **31st IEEE Conference Record of the Thirty-First IEEE Photovoltaics Specialists,** Lake Beuna Vista, Florida, USA, January 3 – 7
participant: Stanisław Pietruszko

[Con6] **3rd Conference "Renewable enerygy sources as alternative to primary energy sources in region,"** Ukraine, April 14 – 17
participant: Stanisław Pietruszko

[Con7] **5th International Conference on Plymers and Adhesives in Microelectronics and Photonics, POLYTRONIC'2005,** Wrocław, Poland, October 23 – 26
participant: Ryszard Kisiel

[Con8] **6th IEEE Latin - America Test Workshop - LATW'2005,** Salvador, Bahia, Brazil, March 30 – April 2
participant: Witold Pleskacz

[Con9] **8th EUROMICRO Conference on Digital System Design,** Porto, Portugal, August 30 – September 3
participant: Witold Pleskacz

[Con10] **APMC'2005 Asia-Pacific Microwave Conference Proceedings IEEE,** Suzhou, China, December 4 – 7
participant: Jerzy Krupka

[Con11] **CCM - International Conference on Pressure Metrology,** Londyn, United Kingdom, April, 18 – 22
participant: Piotr Szwemin

[Con12] **CNI - Ceter of Nanoelectronic Systems for Information Technology (Nanoelectronics Days 2005),** Forschungszentrum Jülich, Germany, February 9 – 11
participant: Bogdan Majkusiak

[Con13] **Conference Photonic West SPIE, Showcasing the Age of Light**, San Jose California, USA, January 22 – 27
participants: Agnieszka Mossakowska-Wyszyńska, Paweł Szczepański

[Con14] **Conference: Management of solar electricity systems in distributed energy generation network,** Ispra, Italy, May 25 – 27
participant: Stanisaw Pietruszko

[Con15] **ESSCIRC'2005 – European Solid-State Circuits Conference,** Grenoble, France, September 12 – 18
participant: Wiesław Kuźmicz

[Con16] **ESSDERC'2005 – European Solid State Device Research Conference,** Grenoble, France, September 12 – 17
participants: Wiesław Kuźmicz, Romuald Beck, Bogdan Majkusiak

[Con17] **IEEE International Conference on Microelectronic Systems Education - MSE'05**, Anaheim, California, USA, June 12 – 13
participant: Witold Pleskacz

[Con18] **INFOS'2005 Conference "Insulating Films on Semiconductors,"** Leuven, Belgium, June 21 – 26
participant: Bogdan Majkusiak

[Con19] **International Conference 4th Nanodiamond and Related Materials jointly with 6-th Diamond and Related Films,** Zakopane, Poland, June 28 – July 1
participants: Andrzej Jakubowski, Jan Szmidt, Małgorzata Kalisz, Artur Szczęsny, Ryszard Gronau

[Con20] **International Congress on Optics and Optoelectronics SPIE,** August 28 – September 2
participants: Ryszard Piramidowicz, Paweł Szczepański, Mariusz Klimczak, Kamila Leśniewska-Matys, Agnieszka Mossakowska-Wyszyńska, Anna Tyszka-Zawadzka, Michał Malinowski, Paweł Czuma, Michał Borecki

[Con21] **ISSE'2005 – 28th UInternational Spring Seminar on Electronics Technology,** Wiener Neustadt, Austria, May 19 – 22
participant: Ryszard Kisiel

[Con22] **MICROTHERM'2005 International Conference Microtechnology and Thermal Problems in Electronics,** Łódź, Poland, June 19 – 22
participants: Jan Szmidt, Małgorzta Trzaskowska

[Con23] **OSA'2005 Frontiers In Optics/ Laser Science Conferences,** Tucson, Arizona, USA, October 16 – 20
participant: Paweł Szczepański

[Con24] **Twentieth European Photovoltaic Solar Energy Conference,** Barcelona, Spain, June 6 – 10
participant: Stanisław Pietruszko

[Con25] **Vacuum Based Science and Technology - Joint Meeting of the German Vacuum Society and the Polish Vacuum Society,** Kraków, Poland, October 26 – 29
participant: Piotr Szwemin

[Con26] **World Conference on Photovoltaics and Sustainable Development,** Durban, RPA, October 29 – November 4
participant: Stanisaw Pietruszko

[Con27] **XVI IEEE-SPIE Symposium on Photonics, Electronics and Web Engineering,** Wilga, , Poland, May 31 – June 5
participants: Ryszard Piramidowicz, Mariusz Klimczak

[Con28] **XXIX International Conference of IMAPS Poland Chapter,** Koszalin – Darłówko, Poland, September 19 – 21
participants: Ryszard Kisiel, Zbigniew Szczepański, Jerzy Kalenik, Mateusz Śmietana

[Con29] **9th Expert Congress on Future Energie,** Essen, Germany, March 14 – 17
participant: Stanisław Pietruszko

[Con30] **CLEO'2005 Europhysics Conference,** Munich, Germany, June 12 – 17
participants: Ryszard Piramidowicz, Paweł Szczepański, Mariusz Klimczak, Kamila Leśniewska-Matys

[Con31] **10th Intel Academic Forum EMEA,** Gdańsk, Poland, May 18 – 20
participant: Zbigniew Jaworski

[Con32] **10th IEEE European Test Symposium,** Tallin, Estonia, May 22 – 25
participants: Wiesław Kuźmicz, Witold Pleskacz

[Con33] **Design Automation Conference,** Grenoble, France, May 21 – 26
participant: Wiesław Kuźmicz

8.2. Local Conferences

[Con34] **Conference: Bezpieczeństwo Energetyczne Polski,** Jachranka, Poland, February 16 – 17
participant: Stanisław Pietruszko

[Con35] **Conference: Strategia Lizbońska w połowie drogi – szanse dla uczelni akademickich,** Poland, December 13
participant: Jerzy Woźnicki

[Con36] **Conference: Study of Poland,** Zegrze, Poland, April 28 – 29
participant: Bogdan Majkusiak

[Con37] **Forum Czystej Energii,** Poznań, Poland, November 11
participant: Maciej Juźwik

[Con38] **Konferencja "Dylematy studiów dwustopniowych,"** Łódź, Poland
participant: Jerzy Woźnicki

[Con39] **Krajowa Konferencja Elektroniki KKE'2005,** Koszalin, Poland, June 13 – 15
participants: Mariusz Sochacki, Jędrzej Stęszewski

[Con40] **V Konferencja „Uniwersytet Wirtualny,"** Warszawa, Poland, June 2 – 4
participant: Bogdan Galwas

[Con41] **VII Krajowa Konferencja Techniki Próżni,** Cedzynia, Poland, September 18 – 21
participants: Piotr Szwemin, Marek Niewiński

[Con42] **XI Krajowe Sympozjum Nauk Radiowych URSI 2005,** Poznań, Poland, April 6 – 9
participants: Mikołaj Bazun, Waldemar Matuszewski

8.3. Schools, Seminars and Meetings

[Con43] **15th International Travelling Summer School on Microwaves and Lightwaves,** L'Aquila, Italy, July 9 – 15
participants: Paweł Szczepański, Bogdan Galwas

[Con44] **Institute seminar:** Mikrofalowe metody charakteryzacji materiałów, December 14
participant: Jerzy Krupka

[Con45] **IX Ogólnopolskie Seminarium „Techniki Jonowe,"** Szklarska Poręba, Poland, March 16 – 18
participants: Tadeusz Adamowicz, Jan Szmidt

[Con46] **Międzynarodowa Szkoła „WS-18 Vacuum Gas Dynamice,"** Avila, Spain, September 4 – 8
participant: Piotr Szwemin

[Con47] **Szkoła Akustyki Kwantowej i Molekularnej,** Ustroń, Poland, February 28 – March 4
participant: Mikołaj Baszun

9. PRIZES

[Prize1] Piotr Szwemin, **Warsaw University of Technology Rector's award for scientific researches** (1st stage - individual), Nagroda Rektora Politechniki Warszawskiej za osiągnięcia naukowe, 2005

[Prize2] Jerzy Woźnicki, **Minister's of National Education and Sport Individual Prize,** (Nagroda Indywidualna Ministra Edukacji i Sportu za wkład w rozwój szkolnictwa wyższego) wrzesień 2005