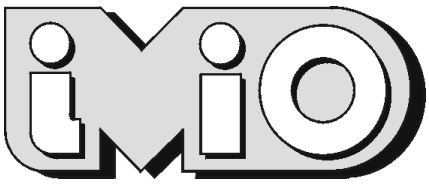
INSTITUTE OF MICROELECTRONICS AND OPTOELECTRONICS



ANNUAL REPORT

2002

Edited by Agnieszka Mossakowska-Wyszyńska

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From the Director

This Annual Report summarises the research activities of the Institute in 2002, as well as the teaching activities in the academic year 2001/2002. These activities of the Institute in the field of electronics and computer engineering are focused on system implementations in both microelectronic and optoelectronic applications. These two areas include VLSI systems, microelectronic and nanoelectronic semiconductor devices, hybrid circuits (e.g. microwave, optoelectronic), sensors, laser optoelectronics, electronic imaging and image processing. It is worth to emphasise, that we develop modelling and CAD as well as manufacturing and diagnostics - methods and tools in the above mentioned areas.

The Institute of Microelectronics and Optoelectronics were founded in 1970. It evolved from the Chair of Radio Engineering created by Professor Janusz Groszkowski in 1929. Our Institute is bounded up with a cradle of the Faculty of Electronics and Information Technology by the person of Professor Janusz Groszkowski who worked in IMiO until His last days of life, as well as by the territory - a half of our Institute is situated in the "Building of Radio Engineering". Here, we develop Technology Centre of the Faculty. It comprises laboratories of silicon processing *(clean room)*, hybrid technologies and assembly techniques, fibre optic and integrated optoelectronic devices fabrication, laser optoelectronics and characterisation of new electronic and photonic materials and manufacturing processes.

Initiatives and creative efforts of the Institute's staff resulted in improvement of the research and teaching infrastructure and the research projects with significant value of (national and international) carried out in the Institute, as well as in valuable publications and individual successes. In my opinion, the most important occurrence in 2002 in the field of teaching organisation was development (together with Institute of Electronic Systems) of a new speciality "Electronics and Computer Engineering" on stationary studies (and additionally a speciality "Computer Engineering" in the field of distance learning - internet studies). I believe that concepts and curricula of this new teaching speciality meet a challenge of the modern development of technology and information society.

I express my sincere appreciation to all colleagues for the big effort and all attainments, which determined the position of our Institute in the Faculty of Electronics and Information Technology. Thank you very much for friendly co-operation in creative and harmonious development of the Institute and for a compliance with high standards in all academic activities.

Warsaw, January 2003

Professor Andrzej Pfitzner, 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;

and two research and teaching groups: Vacuum Science and Technology Group, Characterization of Electronic Materials Group, which exist beyond the division structure.

The main activity of the Institute is focused now on system implementations in both microelectronics and optoelectronics. During the past thirty years the Institute has built up its competence in:

- modelling of physical effects in modern semiconductor devices;
- monocrystalline and amorphous 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;
- the construction and characterisation of optoelectronics elements and devices including fibre sensors;
- 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 the grants form State Committee for Scientific Research and also by the European projects like Inco Copernicus, Vilab Copernicus, ICOP-DEMO, Maria Curie Skłodowska, and NATO for peace.

The results of our scientific activities were published in many paper submitted to prestigious international scientific journals and presented on national and mostly on international conferences in the form of communications as well as the invited lectures. Our involvement in these projects together with a growing number of personal contacts with foreign scientists lead us to formal agreements on international scientific co-operation and participation in a number of international scientific joint projects.

1.2. Board of Directors

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1.3. Microelectronics and Nanoelectronics Devices Division

Head of the Division

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Senior academic staff

Romuald B. Beck, Ph.D., D.Sc.,	Professor
Bogdan Majkusiak, Ph.D., D.Sc.,	Professor
Jan Szmidt, Ph.D., D.Sc.,	Professor
Lidia Łukasiak, Ph.D., D.Sc.,	Assistant Professor
Małgorzata Jurczak, PhD.,	Assistant Professor
Zbigniew Pióro, Ph.D.,	Assistant Professor
Andrzej Rosiński, Ph.D.,	Assistant Professor
Jerzy Rużyłło, Ph.D., D.Sc.,	Associate Professor
Aleksander Werbowy, Ph.D.,	Assistant Professor
Sławomir Szostak, Ph.D.,	Assistant Professor
Jakub Walczak, Ph.D.,	Assistant Professor
Antoni Siennicki, Ph.D.,	Senior Lecturer
Jan Gibki, Ph.D.,	Senior Lecturer
Józef Maciak, M.Sc.	Senior Lecturer

Junior academic staff

Agnieszka Zaręba, M.Sc.,	Assistant
Tomasz Bieniek, M.Sc.,	Ph.D. Student
Piotr Brzozowski, M.Sc.,	Ph.D. Student
Krzysztof Domański, M.Sc.,	Ph.D. Student
Emil Dusiński, M.Sc.,	Ph.D. Student
Andrzej Kociubiński, M.Sc.,	Ph.D. Student
Marek Kostana, M.Sc.,	Ph.D. Student
Adam Linkowski, M.Sc.,	Ph.D. Student
Adam Linkowski, M.Sc.,	Ph.D. Student
Maung Than Htun Aung, 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
Andrzej Wojtkiewicz, 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, borazone, silicon carbide, gallium nitride, silicon-germanium);
- Theoretical studies on MOS-SOI (silicon-on-insulator) and Si:Ge (silicon-germanium) MOS structure physics (modelling of devices behaviour and modelling for characterisation and diagnostics);
- Nanoelectronic phenomena and devices (e.g. tunnel and resonance tunnel diodes and transistors, Coulomb blockade diode, single-electron transistors, memories).
- PECVD deposition of ultrathin dielectric layers for MOSFET gate dielectric (SiO_2, Si_3N_4, SiO_xN_y).

1.4. VLSI Engineering and Design Automation Division

Head of the Division

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Zbigniew Jaworski, Ph.D.	Assistant Professor
Mariusz Niewczas, Ph.D.	Assistant Professor
Elżbieta Piwowarska, Ph.D.	Assistant Professor
Witold Pleskacz, Ph.D.	Assistant Professor
Adam Wojtasik, Ph.D.	Assistant Professor

Junior academic staff

Grzegorz Janczyk, M.Sc.	Ph.D. Student
Adam Jarosz, M.Sc.	Ph.D. Student
Włodzimierz Jońca, M.Sc.	Ph.D. Student
Dominik Kasprowicz, M.Sc.	Ph.D. Student
Adam Kowalczyk, M.Sc.	Ph.D. Student
Wojciech Matysik, M.Sc.	Ph.D. Student

Technical and administrative staff

Jerzy Gempel, M.Sc.
Stanisław Jeszka, M.Sc.
Marcin Sadowski, M.Sc.
Andrzej Wałkanis, M.Sc.
Andrzej Wielgus, 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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Agnieszka Szymańska, Ph.D.	Assistant Professor
Bernard Jakubowski, Ph.D.	Senior Lecturer
Jerzy Skulski, M.Sc.	Senior Lecturer

Junior academic staff

Jarosław Dawidczyk, M.Sc.	Assistant, Ph.D. Student
Robert Rajkowski, M.Sc.	Ph.D. Student
Jerzy Szyper, 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

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Senior academic staff

Michał Borecki, Ph.D.,	Assistant Professor
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Jerzy Kalenik, Ph.D.,	Assistant Professor
Ryszard Kisiel, Ph.D.,	Assistant Professor
Krystyna Lachowska, Ph.D.,	Assistant Professor
Stanisław Pietruszko, Ph.D.,	Assistant Professor
Julitta Pogorzelska	Assistant Professor
Zbigniew Szczepański, Ph.D.,	Assistant Professor
Maria Bebłowska, Ph.D.,	Senior Lecturer

Junior academic staff

Paweł Wrzosek, M.Sc.	Ph.D. Student

Technical and administrative staff

Ryszard Biaduń,
Krystyna Szylko.

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

The main research areas are as follows:

- fabrication and investigation of the following optoelectronic devices: integrated passive and active 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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Jerzy Kęsik, Ph.D.	Assistant Professor
Agnieszka Mossakowska-Wyszyńska, Ph.D.	Assistant Professor
Ryszard Piramidowicz, M.Sc.	Assistant Professor
Anna Tyszka-Zawadzka, Ph.D.	Assistant Professor
Piotr Warda, M.Sc.	Assistant Professor

Junior academic staff

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Krzysztof Dzięciołowski, M.Sc.	Ph.D. Student
Marek Hodzyński, M.Sc.	Ph.D. Student
Marcin Kaczkan, M.Sc.	Ph.D. Student
Wojciech Kamiński, M.Sc.	Ph.D. Student
Monika Kowalska, M.Sc.	Ph.D. Student
Wojciech Kwaśniewski, M.Sc.	Ph.D. Student
Magdalena Nakielska, M.Sc.	Ph.D. Student
Robert Paszkiewicz, M.Sc.	Ph.D. Student
Konrad Świtalski, M.Sc.	Ph.D. Student

Technical and administrative staff

Marek Markiewicz,

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 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
Grzegorz Kukiełka, Ph.D. Assistant Proffesor
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Junior academic staff
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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.

1.9. Vacuum Science and Technology Group

Head of the Group
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Senior academic staff
Marek Niewiński, M.Sc. Lecturer, Ph.D. Student

Technical and administrative staff
Piotr Karwański.

The research work of the Vacuum Technology Team is concentrated on the three main fields:

- vacuum metrology (adaptation of Polish rules to European standards),
- gas flow simulation in vacuum systems, specially in metrological primary standard systems based on continous expansion method,
- development of CAD of vacuum systems.

These works are focused on modelling of low-pressure standards.

1.10. Characterization of Electronic Materials Group

Head of the Group
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Mikołaj Baszun, Ph.D. Assistant Professor
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Janusz Rogowski, Ph.D. Senior Lecturer

Junior academic staff
Paweł Popow, M.Sc. Ph.D. Student
Tomasz Zychowicz, M.Sc. Ph.D. Student

Technical and administrative staff
Zbigniew Rudkowski.

The research activity of the Group of Characterization of Electronic Materials concentrates on electronic materials and sensors.
The main aims of this research are connected with ultrasensitive quantitative analysis of electromagnetic, electric, magnetic and piezoelectric phenomena for materials applied in electronic systems and microsystems. Expecially such measurements obey ultralow temperatures and ultrahigh microwave frequencies. Also SAW sensors are designed and produced.

1.11. Statistical Data

SPECIFICATION	2001	2002	DIFFERENCE
Academic staff	86	80	-6
Tenured professors	5	5	0
Professors	6	7	+1
Associate professors	0	1	+1
Assistant professors	30	31	+1
Senior lecturers	8	6	-2
Lecturers	2	1	-1
Assistants and Ph.D. students	35	29	-6
Technical staff	15	17	+2
Administrative staff	6	5	-1
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	280	291	+11
Library resources	9563	9597	+34
Books (number of volumes)	9563	9597	+34
Journals (number of titles subscribed to)	0	0	0
Teaching activities	62	65	+3
Basic courses	51	53	+2
Advanced courses	9	10	+1
Special courses	2	2	0
International projects	0	0	0
Research projects	58	52	-6
Granted by the University	28	20	-8
Granted by State Institutions	16	20	+4
Granted by International Institutions	11	11	0
Other projects	3	1	-2
Degrees awarded	75	82	+7
D.Sc. degrees	0	1	+1
Ph.D. degrees	4	6	+2
M.Sc. degrees	36	32	-4
B.Sc. degrees	35	43	+8
Publications	96	154	+58
Sci.-tech. books	2	4	+2
Sci.-tech. papers in journals	44	47	+3
Sci.-tech. papers in conference proceedings	39	95	+56
Teaching aids	0	0	0
Other publications	11	8	-3
Reports	44	44	0
Research reports	42	44	+2
Other reports	2	0	-2
Patents	1	1	0
Conferences	155	211	+56
Organised by the Institute (number of conferences)	1	4	+3
Organised by the Institute (number of participants)	13	15	+2
Others (number of conferences)	51	63	+12
Others (number of participants from the Institut	90	129	+39

2. STAFF

2.1. Senior Academic Staff

Tadeusz Adamowicz, M.Sc. ('62), Ph.D. ('73), Quantum Electronics, Gas Discharges; Assistant Professor, full time, Optoelectronics Division, Member of Plasma Physics Section at the Committee of Physics of the Polish Academy of Sciences (’94-), Member of IEEE (’99)

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Romuald B. Beck, M.Sc. ('76), Ph.D. ('82), D.Sc. ('96), Microelectronics, Electronics, Associate Professor, full time, Microelectronics and Nanoelectronics Devices Division, Leader of the Technology, Diagnostics and Modelling Group ('85-), Member of the Microelectronics Section of the Electronics and Telecommunication Committee of the Polish Academy of Sciences ('93-), Member of IEEE (’97-), Member of Electrochemical Society (’98-)

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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 International Travelling Summer Schools (‘91-), Director of Ph.D. Studies in Electronics and Telecommunications (‘92-), 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-)

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Andrzej Wielgus	M.Sc.	Scientific Specialist - technical	660-7207, 7819

3. TEACHING ACTIVITIES

3.1. Basic Courses

[Edu1] **Application of Matlab in Calculation Methods** (Matlab w zastosowanych metodach obliczeniowych) **MZMO**, Mikołaj Baszun
[Edu2] **Basics of Vacuum Technics** (Podstawy techniki próżni), **PTP**, Piotr Szwemin
[Edu3] **Basics of Optics** (Podstawy Optyki), **POPT**, Kazimierz Gniadek
[Edu4] **CAD for PCB (PADS)** (Wspomaganie komputerowe projektowania obwodów drukowanych), **PADS**, Ryszard Kisiel, Jerzy Kalenik
[Edu5] **Characterisation of Microelectronic Structures and Technologies** (Charakteryzacja struktur i technologii mikroelektronicznych), **CSTM**, Bogdan Majkusiak
[Edu6] **Characterisation of Solid State** (Metody badania ciała stałego), **BCS**, Piotr Szwemin
[Edu7] **Computer Aided Design and Manufacturing of Microwave Circuits** (Komputerowe projektowanie i realizacja obwodów mikrofalowych), **KPROM**, Sławomir Palczewski
[Edu8] **Design of audio system** (Konstrukcja aparatury audio), **KAA,** Zbigniew Pióro
[Edu9] **Electronics 1** (Elektronika 1), **ELKA1**, Andrzej Jakubowski, Andrzej Pfitzner
[Edu10] **Electronics 3** (Elektronika 3), **ELKA3**, Wiesław Kuźmicz
[Edu11] **Fundamentals of Computer Science** (Podstawy technik komputerowych), **PTKO**, Michał Borecki
[Edu12] **Fundamentals of Microprocessor Techniques** (Podstawy techniki mikroprocesorowej), **TMIK**, Lidia Łukasiak
[Edu13] **Fundamentals of Solid State Electronics** (Elektronika ciała stałego), **ELCS**, Jan Szmidt, Witold Pleskacz
[Edu14] **Fundamentals of Solid State Electronics 2**, (Elektronika Ciała Stałego 2), **ELCS2**, Zdzisław Mączeński, Janusz Rogowski
[Edu15] **Hardware Implementation of Algorithms in VLSI Circuits** (Sprzętowa implementacja algorytmów w układach VLSI), **SAV**, Elżbieta Piwowarska
[Edu16] **High Frequency Techniques** (Podstawy techniki w.cz.), **TWCZ**, Bogdan Galwas
[Edu17] **Hybrid Integrated Circuits Technology** (Technologia hybrydowych układów scalonych), **THUS**, Zbigniew Szczepański
[Edu18] **Integrated Optoelectronics** (Optoelektronika zintegrowana), **OZT**, Michał Malinowski, Agnieszka Mossakowska-Wyszyńska
[Edu19] **Introduction to the UNIX System** (Użytkowanie systemu UNIX), **USUX**, Andrzej Wielgus
[Edu20] **Laser Applications** (Zastosowania laserów), **ZLA**, Jerzy Kęsik
[Edu21] **Laser Engineering** (Technika laserów), **TL**, Faculty of Applied Physics and Mathematics WUT, Tadeusz Adamowicz
[Edu22] **Laser Physics** (Fizyka laserów), **FLA**, Paweł Szczepański
[Edu23] **Laser Physics 2** (Fizyka laserów 2), **FL2**, Paweł Szczepański
[Edu24] **Logic Circuits** (Układy logiczne), **UKLO**, Institute of Control and Computation Engineering WUT, Adam Wojtasik
[Edu25] **Materials, Elements and Design of Electronic Equipment** (Materiały, elementy i konstrukcje), **MEiK**, Ryszard Kisiel
[Edu26] **Materials, Elements and Design of Electronic Equipment 2** (Materiały, elementy i konstrukcje2), **MEiK2**, Ryszard Kisiel
[Edu27] **Methods and Algorithms for Design Automation of VLSI circuits** (Metody i algorytmy automatyzacji projektowania struktur scalonych), **MAPS**, Adam Wojtasik
[Edu28] **Microelectronics Development Trends** (Kierunki rozwoju mikroelektroniki), **KRM**, Andrzej Jakubowski
[Edu29] **Microwave and Lightwave Integrated Circuits** (Mikrofalowe i optofalowe układy scalone), **MOUS**, Jerzy Piotrowski
[Edu30] **Models and Systems of Image Processing** (Modele i systemy przetwarzania obrazów), **MSPO**, Jerzy Woźnicki
[Edu31] **Modern semiconductor memory** (Współczesne pamięci półprzewodnikowe), **WPP,** Andrzej Jakubowski, Sławomir Szostak
[Edu32] **Noise Reduction in Electronics Systems** (Minimalizacja zakłóceń w aparaturze i systemach elektronicznych), **MZA**, Zdzisław Mączeński
[Edu33] **Numerical Methods** (Metody numeryczne), **MNM**, Institute of Electronic Fundamentals WUT, Jerzy Krupka
[Edu34] **Object Programming in Java** (Praktyka programowania obiektowego w Javie, **PPOJ**., Adam Wojtasik
[Edu35] **Operating Systems 1** (Systemy operacyjne 1), **SOP1**, Andrzej Wielgus
[Edu36] **Optowave Telecommunication** (Telekomunikacja optofalowa), **TEOP**, Bogdan Galwas
[Edu37] **Photoelectric Phenomena in Semiconductors** (Zjawiska fotoelektryczne w półprzewodnikach), **ZFPP**, Stanisław Pietruszko
[Edu38] **Photonics' Fundamentals** (Podstawy fotoniki), **FOT**, Michał Malinowski
[Edu39] **Physical Fundamentals of Information Processing** (Fizyczne podstawy przetwarzania informacji), **FPPI**, Bogdan Majkusiak
[Edu40] **Physics of Solid State** (Fizyka ciała stałego), **FCSR**, Jan Szmidt
[Edu41] **Programming** (Programowanie), **PROG**, Adam Wojtasik, Marek Niewiński
[Edu42] **Programming 8051 microcontroler** (Programowanie mikrokontrolera), **PMIK**, Lidia Łukasiak
[Edu43] **Remote sensors** (Czujniki pól i parametrów ośrodków propagujących), **CPPO**, Mikołaj Baszun
[Edu44] **Quality and Productivity Management** (Zarządzanie produktywnością i jakością), **ZPJ**, Julita Pogorzelska
[Edu45] **Quality in Design and Manufacturing** (Jakość w procesach projektowania i wytwarzania), **JPPW**, Zdzisław Mączeński
[Edu46] **Semiconductor Devices** (Przyrządy półprzewodnikowe), **PPR**, Andrzej Jakubowski
[Edu47] **Semiconductor Devices for Optoelectronics** (Półprzewodnikowe elementy optoelektroniczne), **PEO**, Paweł Szczepański
[Edu48] **Silicon Thin Films** (Cienkie warstwy krzemowe), **CWK**, Stanisław Pietruszko
[Edu49] **Surface Mounting Technology** (Technologia montażu powierzchniowego), **TMP**, Ryszard Kisiel
[Edu50] **Technology of Integrated Circuits Fabrication** (Technologia monolitycznych układów scalonych), **TWMUS**, Romuald Beck
[Edu51] **Thick film sensors** (Grubowarstwowe czujniki pomiarowe), **GCZP**, Zbigniew Szczepański

[Edu52] **Thin Film Material Engineering** (Cienkowarstwowa inżynieria materiałowa), **CIM**, Jerzy Kruszewski
[Edu53] **VLSI Design in Stansard Cell Style** (Projektowanie układów scalonych VLSI w stylu komórek standardowych), **PUVS**, Zbigniew Jaworski

3.2. Advanced Courses

[Edu54] **Advanced Microelectronic and Optoelektronic Technologies** (Zaawansowane technologie mikroelektroniczne i optoelektronczne), **ZTMO**, Romuald Beck
[Edu55] **Advanced Physical Fundamentals of Optoelectronics** (Zaawansowane podstawy fizyczne optoelektroniki), **ZPFO**, Paweł Szczepański
[Edu56] **Design of VLSI Circuits** (Projektowanie struktur scalonych VLSI), **PSSV**, Wiesław Kuźmicz
[Edu57] **Digital Image Processing** (Cyfrowe przetwarzanie obrazów), **CPOO**, Jerzy Woźnicki
[Edu58] **Electronic and Photonic Devices for Telecommunication** (Przyrządy elektroniki i fotoniki dla telekomunikacji), **PEFT**, Bogdan Galwas
[Edu59] **Integrated Optoelectronic Circuits and Optical Logic Circuits** (Zintegrowane układy optoelektroniczne i optyczne układy logiczne), **ZOUL**, Michał Malinowski
[Edu60] **Optical Waveguide Lasers** (Wzmacniacze i lasery światłowodowe), **WLŚ**, Michał Malinowski
[Edu61] **Optoelectronics Techniques of Information Processing** (Optoelektroniczne techniki przetwarzania informacji) ,**OTZI**, Janusz Parka, Jerzy Woźnicki
[Edu62] **Physical Fundamentals of Nanoelectronics** (Podstawy fizyczne nanoelektroniki, **PFN**, Bogdan Majkusiak
[Edu63] **Semiconductor Structures for VLSI and ULSI Circuits** (Struktury półprzewodnikowe dla układów VLSI i ULSI), **SPVU**, Andrzej Jakubowski

3.3. Courses in English

[Edu64] **Electronics 1, EELE1,** Bogdan Majkusiak
[Edu65] **Physics 3, A,** Bogdan Majkusiak

4. RESEARCH PROJECTS

Project definition and description - prepared by Project Leaders.

4.1. Projects Granted by the University

[Pro1] **The Development of Processing and Testing Methods of the Electronic Devices and Materials for Microelectronics and Optoelectronics** (Rozwój metod wytwarzania i badania materiałów i przyrządów w dziedzinie mikroelektroniki i optoelektroniki), project leader: Andrzej Pfitzner, May 2001 - May 2002, **sub-projects:**

[Pro1.1] **Analysis of working conditions and investigations of optically-switched microwave filters with the use of photovaractors** (Analiza warunków pracy i badania filtrów mikrofalowych przełączanych optycznie za pomocą fotowaraktora), sub-project leader: Bogdan Galwas, co-workers: Jerzy Piotrowski, Jerzy Skulski, Zenon Szczepaniak, Bożena Janus

The work is focused on development of optically-switched microwave filters with a new type of semiconductor optoelectronic device, which is a photovaractor. The investigations of optically-variable impedance of the photovaractors as well as elaboration of the small-signal model of the device are essencial for proper designing of optically controlled microwave circuits. Experimental verification of this model can be conducted by designing of various optically-switched microwave pass-band filters.

[Pro1.2] **Colour image segmentation – methods, range of application and quality of image segmentation assessment** (Segmentacja barwnych obrazów cyfrowych – metody, zakres zastosowań, kryteria oceny jakości segmentacji), sub-project leaders: Hanna Górkiewicz-Galwas, Grzegorz Kukiełka

The goal of this project is to investigate to what extent segmentation results based on grey-level information can be improved by using colour information. Because segmentation results of grey-level images might be negatively affected by the presence of intensity changes due to shadows we have investigated to what extent these segmentation results can be improved by using colour information. The influence of different colour systems will be examined, as well as new segmentation methods will be developed (for instance clustering and region growing algorithms).

[Pro1.3] **Integrated Environment for VLSI Design** (Zintegrowane środowisko projektowania układów scalonych), sub-project leader: Wiesław Kuźmicz

This project aims at development of an environment integrating existing CAD tools for VLSI design (developed in the Institute of Microelectronics and Optoelectronics) with new Web-based design verification services („virtual IC prototyping" Web site also developed in the Institute of Microelectronics and Optoelectronics). The project includes creation of a design database management, design version control scheme, design integrity verification, scheduling of tasks and direct interaction with services available on the Web.

[Pro1.4] **Investigation and modeling of nonlinear solid state laser media** (Modelowanie i badanie nieliniowych ośrodków czynnych laserów ciała stałego), sub-project leader: Michał Malinowski

Short wavelength operation of diode laser pumped solid state laser systems could be produced by using nonlinear techniques. Thus, harmonic generations in nonlinear crystals and frequency upconversion are two promising techniques. This program is related to the problem of self-frequency doubling in rare-earth activated nonlinear matrices. Optical and laser properties of Pr^{3+}, Dy^{3+}, Tm^{3+} and Er^{3+} doped lithium niobate ($LiNbO_3$) crystals are investigated. Optical inhomogeneity and linewidths are studied by means of high-resolution laser spectroscopy and related to the matrix structure.

[Pro1.5] **RIE of GaN layers in flourine plasmas (technology and characterization)** (Trawienie warstw azotku galu w plazmie fluorowej (technologia i charakteryzacja)), sub-project leader: Romuald B. Beck, co-workers: Andrzej Jakubowski, Bogdan Majkusiak, Jan Szmidt, Tomasz Janik, Aleksander Werbowy, Lidia Łukasiak, Sławomir Szostak, Witold Ciemiewski, Kazimierz Dalbiak, Małgorztata Trzaskowska, Krzysztof Domański, Andrzej Wojtkiewicz and students

In all ivailable techniques of GaN monocrystalline layer fabrication, a removal of topmost, deffective layer is essential to obtain good, device quality material. The aim of this study was to examine feasability of GaN layers etching by RIE in fluorine containing plasmas (less angerous and more stable than chlorine containing plasmas widely used for GaN etching).

[Pro1.6] **The development of Moly Flow..er Plus program library for obtaining the total correction factor of vacuum primary standards.** (Opracowanie modulu współczynnika korekcji totalnej systemów metrologicznych dla programu Moly Flow ..er Plus), sub-project leader: Piotr Szwemin, co-worker: Marek Niewiński

During recent works based mainly on improving the accuracy of the continuous expansion system it was found that gas angular distribution (on the inlet to the gause tubulation) is not the cosine, what is generally persumed. This effect can introduce large uncertainties. The goal of this project is to extent the Moly Flow..er Plus program posibilities to calculate the total corection factor whith will take into account effect discribed above. For this purpose the program will trace the paths of molecules in gauge tubulation eploying Monte-Carlo simulation method.

[Pro1.7] **The micro-opto-mechanical vibration sensor** (Mikrooptoelektromechaniczny czujnik wibracji), sub-project leader: Jerzy Kruszewski, co-workers: Michał Borecki, Maria Bebłowska, P. Wrzosek.

An optical vibration sensor exploiting the modulation of power transmitted between optical fibers is elaborated. The modulation is achieved by masking of the receiving fiber from the emitted light beam by micro-machined cantilever. The study of cantilever material and sensor geometry is done by elaborated computer method.

[Pro2] **The Development of Processing and Testing Methods of the Electronic Devices and Materials for Microelectronics and Optoelectronics** (Rozwój metod wytwarzania i badania materiałów i przyrządów w dziedzinie mikroelektroniki i optoelektroniki), project leader: Andrzej Pfitzner, May 2002 - May 2003, **sub-projects:**

[Pro2.1] **Image and object parameters for visual information retrieval systems** (Wyszukiwanie parametrów obrazów i obiektów na obrazach dla potrzeb bazy danych fotografii cyfrowej), sub-project leader: Grzegorz Kukiełka

The human perception mechanism is equipped with an amazing system for recognising an infinite number of shapes, colours, patterns, textures, object and backgrounds. The mechanics of such capabilities are of course not fully understood. A visual document has similar ingredients of the human environment i.e.; it has features such colour, line, region, corners and textures. A full functional retrieval system provides means to store, organise, add and delete images and search those images by content. In our system the indexed visual image features are used in query interfacing. The typical visual features are local and global colour, texture and sketch. One major task of our project is visual features space development and optimisation.

[Pro2.2] **The implementation of the distributed Monte-Carlo computation shame to determination of the gas state parameters in the metrological systems** (Obliczenia rozproszone w zastosowaniu do wyznaczania parametrów układów metrologicznych metodą Monte-Carlo), sub-project leader: Piotr Szwemin, co-worker: Marek Niewiński

The dynamic expansion systems are generally used for generation of calibration pressures in the high and ultra high vacuum range. The uncertainty of the generated pressure can be evaluated by means of a computer simulation. In such a case, the MC method is limited by a very long time of computation. To omit this disadvantage, the distributed calculation model has been implemented in the form of a computing environment. It consists of three applications: ***Moly_Flow..er_Editor***, ***Moly_ Flow..er_Server*** and ***Moly_Flow..er_Console***. The first application is used to create the description of the calibration system's geometry. The ***Moly_Server*** is working as a service on PC computers and waiting for simulation tasks to be performed. The ***Moly_Console*** defines, starts and finishes simulation projects. The project is defined by: the geometry description of the system, collection of computers with running ***Moly_Server*** service, and parameters to be evaluated.

[Pro2.3] **The method development for projecting optoelectronics and photonics microsystem (**Rozwój metod projektowania konstrukcji i badania mikrosystemów optoelektronicznych oraz fotowoltaicznych), sub-project leader: Jerzy Kruszewski, co-workers: Michał Borecki, Maria Bebłowska, Stanisław Pietruszko, Zbigniew Szczepański

The new methods for projecting optoelectronics and photonics micro system are forced by technological progress. The optoelectronics micro systems realisations in MOEMS technology and on the second hand incorporate PMMA optical fibre grows rapidly. These are the new technology, so the new methods incorporate computer models are under investigation. The components of photonics systems are in on market state. Therefore, the research of their reliability and application are taken.

[Pro2.4] **Nanoelectronic test structures** (Struktury testowe dla nanoelektroniki), sub-project leader: Romuald B. Beck, co-workers: Andrzej Jakubowski, Bogdan Majkusiak, Jan Szmidt, Aleksander Werbowy, Lidia Łukasiak, Sławomir Szostak, Jan Gibki, Agnieszka Zaręba, Jakub Walczak, Witold Ciemiewski, Kazimierz Dalbiak, Małgorztata Trzaskowska

The project aims at review of effects, devices, technologies and characterisation methods that can be practically implemented into fabrication in technological lab. of Institute of Microelectronics and Optoelectronics, Warsaw University of Technology.

[Pro2.5] **Operating conditions analysis of the transistor oscillator coupled with the photovaractor** (Analiza warunków pracy oscylatora tranzystorowego sprzężonego z fotowaraktorem), sub-project leader: Bogdan Galwas, co-workers: Jerzy Piotrowski, Jerzy Skulski, Jarosław Dawidczyk, Bożena Janus

The aim of the work is analysis of operating conditions, design and measurements of the microwave transistor oscillator, which is optically controlled by using indirect method. The indirect method uses Optically Variable Capacitor, i.e., device that contains microwave varactor controlled by photodiode. This method allows optical control of microwave generator frequency.

[Pro2.6] **New and improved methods of simulation od manufacturing processes in microelectronics and modeling of IC devices** (Nowe i ulepszone metody symulacji procesów produkcyjnych mikroelektroniki i elemrntów układów scalonych), sub-project leader: Wiesław Kuźmicz, co-workers: Zbigniew Jaworski, Andrzej Pfiztner, Adam Wojtasik, Elżbieta Piwowarska,

The goal of this work is to improve existing models or develop new ones for simulation of manufacturing processes in microelectronics and for device modeling. These models will be implemented in our CAD software extending its capabilities toward deep submicron CMOS processes. In particular, the following topics will be included: simulation of very shallow ion implanatation, simulation of rapid thermal annealing, simulation of deposition and doping of polysilicon, 2D and simplified 3D simulation of MOS devices, new MOS device models (BSIM4, EKV).

[Pro2.7] **Measurements of the complex permittivity of single crystal oxides and software development for automation of measurement of insertion loss vs. frequency dependence for SAW delay lines** (Badania zespolonej przenikalności elektrycznej monokryształów tlenkowych oraz opracowanie oprogramowania do automatycznych pomiarów charakterystyk częstotliwości linii opóźniających APF), sub-project leader: Jerzy Krupka, co-workers: mikolaj Baszun

The objective of the first part of this work is joint research on measurements of the complex permittivity of new dielectric materials at microwave frequencies and cryogenic temperatures under polish-australian linkage grant entitled: INVESTIGATIONS AND CHARACTERIZATION OF NEW MATERIALS FOR WIRELESS COMMUNICATIONS. Goals of this work will be elaboration of measurement techniques including electromagnetic fields analysis, optimisation of measurement fixtures and manufacturing of test samples. The second part of the work is connected with surface acoustic wave delay lines and is aimed to software development for automation of insertion loss vs. frequency measurements. Control of the measurement processes are realized with using of specialized computer interface card. Software is designed with using of C language enviroment.

[Pro2.8] **Modelling and investigation of waveguide laser structures** (Modelowanie i badanie światłowodowych struktur laserowych), sub-project leader: Michał Malinowski

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

[Pro3] **Integrated signal discriminator for straw-based detectors used in high energy physics experiments** (Opracowanie scalonego układu odczytu danych z detektorów gazowych dla eksperymentów fizyki wysokiej energii), Institute of Microelectronics and Optoelectronics in the cooperation with Institude of Radioelectronics, project leader: Elżbieta Piwowarska, co-workers: Witold Pleskacz, Adam Jarosz, June 2001-May 2002

The objective of this project is the electrical design and verification of the analogue integrated circuit to be used in the CERN experiments. The circuit is designed in BiCMOS AMS 0.8 um technology. The main requirements for the circuit are low-noise and high sensitivity.

[Pro4] **Methods of the VLSI ICs Layout Analysis from the Manufacturabiliy Point of View** (Metody analizy topografii układów scalonych VLSI z punktu widzenia produkowalności tych układów), project leader: Witold Pleskacz, June 2001-May 2002

The main goal of the project is to write a monograph on VLSI ICs layout analysis methods from the manufacturabiliy point of view. In this monograph the following research subjects will be included: layout-oriented manufacturing yield modeling, defect-based approaches to fault modeling, design for manufacturability of integrated circuits, and defect oriented testing methodologies.

[Pro5] **Microelectronic SAW sensors** (Mikroelektroniczne czujniki z akustyczną falą powierzchniową), project leader: Mikołaj Baszun, co-workers: Dariusz Grzęda, Jerzy Rudkowski, June 2001-May 2002

This work obeys: Working out the methods and computer program for design of sensors with dominating one of the three useful wave modes: Rayleigh mode, shear horizontal mode and/or acoustic plate mode; Working out the methods and computer program for analysis of transmittance of SAW delay lines with arbitrary geometry of interdigital transducers. These researches are planned to be continued in the next years, ending by production of some kinds of chemosensors. The design will be done, and practical examples of the delay lines will be made.

[Pro6] **Porous silicon technology for applications in humidity sensors** (Technologia krzemu porowatego dla zastosowań w czujnikach wilgotności), project leader: Romuald B. Beck, co-workers: Andrzej Jakubowski, Bogdan Majkusiak, Jan Szmidt, Aleksander Werbowy, Lidia Łukasiak, Sławomir Szostak, Witold Ciemiewski, Kazimierz Dalbiak, Małgorztata Trzaskowska, Krzysztof Domański, June 2001-May 2002

Porous silicon allows construction of device that can be used as humidity sensor. The study of possible construction design and manufacturing of such devices are the main aim of this project. Particular attention is paid for the technology of optimium porous silicon structure formation.

[Pro7] **Technological processes for silicon carbide – a novel material for microelectronics, optoelectronics and microsystems** (Procesy technologiczne węglika krzemu półprzewodnikowego materiału nowej generacji dla mikroelektroniki, optoelektroniki i mikrosystemów), project leader: Jan Szmidt, co-workers: Andrzej Jakubowski, Bogdan Majkusiak, Romuald B. Beck, Aleksander Werbowy, Agnieszka Zaręba, Maung Than Htun Aung, Tomasz Guzdek, Krzysztof Domański, June 2001 - May 2002

The main goal of the project is development (on a laboratory scale) of basic processing methods of SiC substrates:
-substrate pretreatment prior dielectric layers deposition,
-deposition of oxide as well as nitride dielectric layers,
-deep substrate etching in order to obtain MESA structures,
-and subsequent fabrication and characterization of MIS capacitors on SiC.

[Pro8] **The elaboration of optical fibre micro-switch with optic piezoelectric actuator** (Opracowanie piezoelektrycznego mikroprzełącznika światłowodowego), project leader: Jerzy Kruszewski, co-workers: Michał Borecki, Maria Bebłowska, P Wrzosek, June 2001-May 2002

An optical moving mirror micro-switch is elaborated. The aim of this work is to study the lowest possible dimension of such a construction. The computer method of switch optic parameters modelling is developed. The results show that the micro-switch dimensions are bounded by actuator and collimating system.

[Pro9] **Visible rare-earth doped fiber laser** (Analiza pracy, badanie i opracowanie widzilnego, światłowodowego lasera włóknowego), project leader: Michał Malinowski, June 2001-May 2002

Generally, due to waveguide effect, resulting in strong optical field confinement, fiber lasers are several orders of magnitude more efficient than conventional lasers. They can be pumped by laser diodes and can easily operate in a single spatial mode. For these reasons fiber lasers can be considered as compact solid state lasers of high efficiency and good beam quality. This work is focused mainly in visible lasers because this region offers several challenges to the conventional systems. Our research is oriented to visible laser generation by using rare earth doped optical fibers as the active material. Especially, upconversion processes are investigated in Ho^{3+} and Pr^{3+} doped ZBLAN glasses. In frequency upconversion process energy of two or more IR photon is used to populate a high lying energy level of activator ion from which one-photon downconversion transition yield visible light. Thus, upconversion lasers generate radiation at wavelengths shorter than those of pumping sources.

[Pro10] **Development of a microscopic image analysis system for medical images** (Integracja systemu do analizy obrazów mikroskopowych), project leader: Hanna Górkiewicz-Galwas, June 2002-May 2003

Video and digital computation technologies have contributed in a major way to the recent renaissance of light microscopy. It was the aim of this project to build an application of the computer-assisted image analysis, as an example for the use of video-microscopy in biomedicine. By coupling a CCD-based video camera to a microscope, and storing the recorded images to computer hard disk via a frame-grabber, the basic unit for a microscopic image analysis system can be set up at an affordable price. For processing and analysis of digitised images, several software packages are available at the market, covering a wide spectrum in price and functionality. The first and usually the most difficult stage in a biomedical image processing system is the object isolation. A variety of automated and semiautomatic methods have been implemented in our work to perform this task, representing a major improvement in comparison to older manual methods.

[Pro11] **Elaboration of the methodology of characterisation of PV systems** (Charakteryzacja metod pomiarowych stosowanych w badaniach systemów fotowoltaicznych) project leader: Stanislaw M. Pietruszko, July 2002 – June 2003

Elaboration of methodology for gathering measurement data in Data Acquisition Systems dedicated for PV systems, as well as introducing new procedures for data analysis.

[Pro12] **Investigating of the influence of small hydrogen content on the transport parameters of charge carriers in amorphous silicon** (Badanie wpływu małych zawartości wodoru na parametry transportu krzemu amorficznego), project leader: Stanisław M. Pietruszko, December 2002 – June 2003

Investigating of the influence of small hydrogen content (0,05 - 1 at.%) on the transport parameters (conductivity, activation energy, etc.) of charge carriers in amorphous silicon.

[Pro13] **Investigation and realisation of Intelligent fibre optic sensor for solution concentration examination** (Opracowanie i wykonanie modelu inteligentnego czujnika światłowodowego do badania stężeń roztworów), project leader: Jerzy Kruszewski, co-workers: Michał Borecki, Maria Bebłowska, Paweł Wrzosek

The sensor head is the ending of the large core polymer optical fibre. The head works on the reflection intensity basis. The reflected signal level depends on Fresnel reflection and reflection on suspended matter when the head is submersed in solution. The sensor head is mounted on a lift. For detection purposes the signal includes head submerging, submersion, emerging and emergence is measured. This way the viscosity turbidity and refraction coefficient has an effect on measured signal. The signal forthcoming from head is processed electrically in opto-electronic interface. Then it is feed to neural network. The novelty of presented sensor is implementation of neural network that works in generalisation mode. The sensor resolution depends on opto-electronic signal conversion precision and neural network learning accuracy. Therefore, the number and quality of points used for learning process is very important. The example sensor application for examination of liquid soap concentration in water is realised.

[Pro14] **Investigation of planar waveguide Yb^{3+}:YAG/YAG laser** (Opracowanie I zbadanie planarnego lasera światłowodowego Yb^{3+}:YAG/YAG), project leader: Michał Malinowski, June 2002 – May 2003

Diode-pumped, solid-state lasers have a wide variety of applications in the industrial, military, medical, and research sectors. Here we discuss the use of a planar waveguide lasing geometry, which is well matched to that of a diode bar reducing or eliminating the need for beam shaping. Recently, much attention has been focused on Yb-doped solid-state lasers and Yb-doped materials due both to the favourable functions of Yb ions in many kinds of laser host material and to the recent advances in high power laser diode pumping sources. Access to liquid phase epitaxy allows us fabrication of Yb:YAG waveguides on YAG substrates with low propagation losses. Theoretical works and experimental studies on Yb:YAG/YAG planar waveguide lasers are developed.

[Pro15] **Measuring system of liquid viscosity with using of piezoceramic ultrasonic transducers** (System pomiarowy lepkości cieczy z wykorzystaniem piezoceramicznych przetworników ultradźwiękowych) project leader: Jerzy Krupka, co-workers: Mikolaj Baszun, Jerzy Rudkowski, Mariusz Mróz, Paweł Popow, June 2002-May 2003

The work obey:
Analysis, design and experimental testing of an electronic system for liquid viscosity measuring system. The measuring process is based on ultrasonic wave velocity dependence on liquid viscosities.

[Pro16] **Modelling and investigation of physical phenomena in low-dimensional nanoelectronic MOS and MOS SOI structures** (Modelowanie i badanie zjawisk fizycznych w nanoelektronicznych strukturach niskowymiarowych MOS i MOS SOI) project leader: Bogdan Majkusiak, co-workers: J. Walczak, Andrzej Jakubowski, Romuald B. Beck, Jan Szmidt, Aleksander Werbowy, Lidia Łukasiak, Sławomir Szostak, Jan Gibki, Agnieszka Zaręba, Jakub Walczak, Witold Ciemiewski, Kazimierz Dalbiak, Małgorztata Trzaskowska, June 2002 – May 2003

The project is devoted to modelling of quantum-mechanical phenomena in low-dimensional structures based on the MOS system. The density of electron charge in the channel of MOS or MOS SOI structures is investigated as a function of the channel thickness and the gate oxide thickness.

[Pro17] **Researches on stability and long-life performance of metal ion UV laser generation in noble gas – copper halide mixtures** (Badania nad zwiększaniem stabilności generacji i długowieczności ultrafioletowego lasera jonowego na mieszaninie neonu i halidków metali), project leader:Tadeusz M. Adamowicz, June 2002 – May 2003

Spectral emission on Cu II UV levels in 248-270 nm range as well laser oscillations on UV and IR Cu II transitions in He/Ne – copper halide mixtures are investigated. Special systems based on the cathaphoresis effect and thermal shields are used to prevent contamination of optical parts of the laser tubes. The efficiency the systems was tested by measuring the long-time stability of the laser and spectral emission intensities.

[Pro18] **Studies on monitoring procedures of autonomous PV systems** (Opracowanie procedur monitorowania autonomicznych systemów fotowoltaicznych), project leader: Stanislaw M. Pietruszko, July 2002 – June 2003

Project and installation of electronic data acquisition systems. Studies on procedures of computer aided data analysis as well as introducing guidelines for designing and installing stand-alone PV systems.

[Pro19] **The determination of the gas state parameters in the dynamic gas expansion calibration system based on the idea of global correction factor** (Wyznaczanie parametrów stanu gazu w układzie wzorca próżni z dynamiczna ekspansją gazu, w oparciu o koncepcję globalnego współczynnika korekcyjnego), project leader: Piotr Szwemin, co-worker: Marek Niewiński, June 2002-May 2003

The work is concentrated on the gas flow modelling in high vacuum standards with the dynamic expansion of gases. The weakness of traditional model, which bases on the electrical circuit's analogy, has motivated the author to elaborate a new, global model. The macroscopic parameters as the gas number density and the gas flux density in the local volumes of the calibration chamber are evaluate on the base of the molecules behaviour in microscopic scale of this model. The molecules are traced in the whole space of the high vacuum standard. Its inner surfaces are described by the mathematics equations as close as possible as well as the gas molecules interactions are also described by experimentally well confirmed scattering law. Using this model it is possible to study even the influence of mutual relations between the system elements. By this way it will be also possible to find the source of systematic differences between the particular high vacuum standards.

[Pro20] **Visual queries for image database systems – methods and algorithms development** (System wyszukiwania treści obrazowych w fotograficznych bazach danych - rozwój metod oraz narzędzi algorytmicznych i programowych), project leader: Grzegorz Kukiełka

The amount of information that is generated and becomes available in today's world is alarming. Large databases used to be available only in major corporations and organisations. Now the smallest of enterprises want to use databases to store their data, e.g., individual scientists generate experimental data of large quantities, and of course, everybody places all kinds of information on the web, some of it under databases control. Moreover, the conceptual structure of the data that becomes available is increasing in complexity as well. In turn, this affects the queries that users want to pose on this data, whose complexity is also rising. It is now urgently necessary to provide user interfaces that require much less database sophistication and expertise by the users than currently, but an adequate solution does not seem to be in sight. A full functional visual information retrieval system provides means to store, add and delete images and search those images by content. The main goal of the project is visual query system development and optimisation.

4.2. Projects Granted by the State Committee for Scientific Research (KBN)

[Pro21] **Digital image analysis and processing of neovascularization** (Analiza procesów neowaskularyzacji metodami cyfrowego przetwarzania obrazów), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jerzy Woźnicki, co-workers: Grzegorz Kukiełka, Hanna Górkiewicz-Galwas, Jerzy Domański, Bartosz Dudziński, Ryszard Pająk, April 1999 – March 2002

Angiogenesis is the formation of new blood vessels, which occurs in normal physiological conditions. It is also an underlying process in the pathogenesis and invasion of neoplasms. New blood vessels develop from pre-existing blood vessels. Different substances may have an influence on the process. The process of angiogenesis is subject to the effects exerted by pro- and anti-angiogenic factors released by various cells and tissues which, in normal physiological conditions, are maintained in balance. However, a loss of the balance leads to generation or inhibition of neovascularisation.

The main goal of the project is to assess the effects of various substances on the development of new blood vessels using digital image processing system in co-operation with surgical microscope and Sidky and Averbach criteria (1975). The digital image processing methods introduce automatic quantification of surface, shape and size of new blood vessels.

The most significant information portrayed visually in the microscpic images refers to physical changes reflecting processes in the new blood vessels as well as their geometry. Hence the first stage is to detect the contours of the objects studied. The method of detecting the contours of new blood vessels is an advanced type of filtration, which may be described as a recursive differential filter (RDF). The method used in the digital computer image processing in order to remove the information about 'large' blood vessels will allow automated quantification of new blood vessels formed in the due course of angiogenesis.

[Pro22] **Investigations and modelling of the influence of parasitic phemomena on the operation of the VLSI circuits, taking into account manufacturing conditions** (Badanie i modelowanie wpływu zjawisk pasożytniczych na pracę układów scalonych VLSI z uwzględnieniem uwarunkowań technologicznych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Andrzej Pfitzner, co-workers: Elżbieta Piwowarska, Witold Pleskacz, Jacek Laskowski, Adam Lejman, Robert Miklas, Jerzy Gempel, Stanisław Jeszka, Adam Jarosz, March 1999 - February 2002

The purpose of the project is consideration of the parasitic phemomena in the VLSI circuits and developing effective methods of modelling of these effects, taking into account disturbances of the real manufacturing process. The main research tasks are: developing new simulation methods of the parasitic phenomena like signal delays in interconnections of the RLC type; evolving effective models of the parasitic elements and methods of extraction of model parameters; developing methods of evaluation of the interactions in complicated connections configurations.

[Pro23] **Solid state micro-lasers for visible wavelengths** (Mikrolasery ciała stałego na zakres widzialny), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Michał Malinowski, September 2000 – July 2002

Micro-lasers are miniature, diode-laser powered, solid state lasers of particularly simple design. The laser consists of a slice of active material polished to be plane parallel with mirrors applied directly to the crystal faces. For the operation of this structure thermal and gain-related waveguiding plays an important role. The program is oriented on the analysis and investigation of these devices at visible wavelength of the spectrum. Structures fabricated from Pr^{3+}, Ho^{3+}, Tm^{3+} and Er^{3+} activated YAG crystals are investigated.

[Pro24] **Novel dielectric layers for silicon carbide preserving their properties at elevated temperatures** (Nowe dielektryczne warstwy na węgliku krzemu zachowujące swoje właściwości w podwyższonych temperaturach), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jan Szmidt, co-workers: Aleksander Werbowy, Andrzej Jakubowski, Romuald B. Beck, Bogdan Majkusiak, Lidia Łukasiak, Jan Szmidt, Agnieszka Zaręba, Józef Maciak, Antoni Siennicki, Aleksandra Sokołowska, Mietek Bąkowski, Piotr Niedzielski, October 2000 - September 2003

The aim of the project is to investigate various dielectric layers on SiC and Si substrates at elevated temperatures (up to 500^{o}C). These are films of nitrides (AlN, BN) and oxides (Al_2O_3, TiO_2, Ta_2O_5).

[Pro25] **Silicon-germanium (SiGe) – material for new generation CMO devices** (Krzemogerman (SiGe) – materiał dla przyrządów CMOS następnej generacji), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Małgorzata Jurczak, co-workers: Andrzej Jakubowski, Jan Szmidt, Romuald B. Beck, Bogdan Majkusiak, Lidia Łukasiak, Agnieszka Zaręba, Antoni Siennicki, Aleksander Werbowy, Tomasz Dębski, Sławomir Szostak, Jan Gibki, Jakub Walczak October 2000 - September 2003

Silicon-germanium significantly improves the speed of operation of both MOS and bipolar devices. The aim of the project is to develop a mathematical description of basic devices of contemporary CMOS and BiCMOS circuits (MOSFEET, HBT and MOSCAP) fabricated using the Si/SiGe heterostructure. The developed models will enable device optimization (e.g. profile and concentration of Ge in the SiGe base or channel). These models will also become the basis for extensive characterization of these devices, mainly through the analysis of I-V and C-V characteristics.

[Pro26] **Ultrathin SiO2 and high-K dielectric layers for next generation ICs"** (Ultracienkie warstwy SiO2 oraz dielektryki o wysokiej przenikalności elektrycznej dla układów scalonych nowej generacji), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Andrzej Jakubowski, co-workers: Romuald B. Beck, Bogdan Majkusiak, Lidia Łukasiak, Jan Szmidt, Agnieszka Zaręba, Józef Maciak, Andrzej Wojtkiewicz, Krzysztof Domański, Sławomir Szostak, Jan Gibki, Jakub Walczak, Michał Korwin-Pawłowski, Jerzy Rużyłło, October 2000 - September 2003

The ITRFS roadmap points out clearly that the required for next few MOS-ICs gate SiO2 thickness will fall as low as to the few monolayers only. Formation of such extreemely thin layers in a controlable and repeatable way is enormous challenge for silicon technology. The work will address few critical problems, namely: design of appropriate test structures, analysis of high-K dielectrics potentially suitable for the gate stack, investigation of begining stages of oxidation and nitridation, theoretical models of C-V behaviour and charge pumping allowing determination of the studies layers quality, development of the ultrathin layers technology (single layers) and double (ultrathin +additional – high-K). Part of the study is performed in collaboration with X-ion (company localed in France), which aims to develop a novel technology of ultrathin layers formation.

[Pro27] **Methodology of designing standard CMOS cells in case of realisation of low-voltage and low-power integrated circuits** (Metodyka tworzenia komórek standardowych CMOS dla potrzeb realizacji układów scalonych o niskim poborze prądu i bardzo niskim napięciu zasilania), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Marcin Sadowski, co-workers: Wiesław Kuźmicz, November 2000 - March 2002

The main research tasks of the project are: developing of new methodology of realisation and designing of electrical schemas and layouts of low-voltage low-power analogue and digital standard cells for standard bulk CMOS process. Developed methodology and standard cells will find application in design process of low-voltage Application Specific Integrated Circuits (ASIC's) with the aid of standard tools used for automatic design of ASIC's.

[Pro28] **Optimization of construction and technology of ion argon laser discharge tube** (Optymalizacja konstrukcji i technologii wykonania ceramiczno-metalowej rury wyładowczej jonowego lasera argonowego), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jerzy Kęsik, February 2001 – December 2003

The main aim of the project is to construct ion laser tube with quasi-continuous SiC discharge capillary. The silicon carbide has good vacuum properties, high thermal conductivity and high resistance on ion sputtering effect. The anticipated effect of this construction is decreasing of gas pumping phenomena and increasing of laser output power. The additional application of permanent ring magnets should also substantially enhance the output power.

[Pro29] **New active planar photonic band-gap structures** (Nowe aktywne struktury planarne z fotoniczne przerwą zabronioną), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Paweł Szczepański, co-workers: Agnieszka Mossakowska-Wyszyńska, Anna Tyszka-Zawadzka, Robert Paszkiewicz, Michał Malinowski, Ryszard Piramidowicz, Andrzej Jakubowski, February 2001 – June 2003

The purpose of this project is the investigation of the new active materials based on photonic bang gap structures. Particularly, modelling of the light generation in planar photonic band-gap waveguide laser structures and planar waveguide laser structures having photonic band-gap active medium is performed. The effects of the structure parameters on the threshold gain, output power and coherence of the generated light are considered for various types of the laser cavities (e.g. F-P, DFB, DBR etc.).

The analysis of the possible technologies suitable for the manufacturing of active photonic band-gap crystals and active photonic band-gap planar waveguide structure is carried out.

[Pro30] **Passivation layers for SiC Schottky diodes** (Wybrane warstwy pasywujące dla diod Schottky'ego na węgliku krzemu), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Mariusz Sochacki, September 2001 – February 2002

The aim of the project is selecting and classification of dielectric materials which are suitable for passivation of SiC-based electronic devices. Investigated are RF and pulse plasma deposited carbon, AlN, Al_2O_3, TiO_2 films. The main goal is growing of such layers onto SiC electronic structures and subsequent evaluation of their parameters. These are adhesion of films to the substrate, the influence of grown films on electrical properties of Schottky junctions as well as long-term stability of these parameters. Also the influence of the temperature on properties of layers and I-V characteristics of Schottky diodes are being examined within the framework of this study.

[Pro31] **Photon avalanche studies in holmium doped laser materials** (Badanie zjawiska lawinowego w materiałach laserowych domieszkowanych Ho^{3+}), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Artur Wnuk, August 2001 – June 2002

In this work we described the photon avalanche up- conversion processes in various Ho3+ doped materials. The holmium ions was spectroscopically investigated in YAP, YAG, YLF crystals and ZBLAN gals.

At several excitation region we observed the up-conversion in all this materials. At 584 nm excitation we observed the photon avalanche process. This process was discussed on the basis of rate equation modelling. The calculated data was compared with experimental results. Our mathematical model was positively verified.

[Pro32] **Thermally-induced metastability of amorphous silicon** (Termicznie indukowana metastabilność krzemu amorficznego), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Andrzej Jakubowski, co-workers:, Marek Kostana, October 2001 - December 2002

The project was devoted to the studies of thermally–induced metastability of amorphous silicon with the aim of using this effect in photovoltaic cells. Studies included the analysis of the influence of hydrogen content a metastability and sensitivity of photoelectric layers.

[Pro33] **Characterisation of the emission properties of Ho^{3+} doped $SrLaGa_3O_7$ and $SrLaGaO_4$ laser crystals** (Charakterystyka własności emisyjnych kryształów laserowych $SrLaGa_3O_7$ and $SrLaGaO_4$ aktywowanych jonami Ho^{3+}), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Marcin Kaczkan, August 2001 – June 2002

The principal interest in studying rare earth doped $SrLaGa_3O_7$ (SLG) and $SrLaGaO_4$ (SLO) crystals is due to their structural disorder and resulting inhomogeneous broadening of the optical transitions and due to the ability of accepting high concentration of activator. Holmium ion has been chosen as a dopant because it shows laser action at different wavelengths, from 550 nm to 3.9 μm, in a variety of hosts and offers various upconversion mechanisms, which may be enhanced in SLG and SLO systems because of their structural properties.

The purpose of this investigation is to study the optical properties of Ho^{3+} in $SrLaGa_3O_7$ and $SrLaGaO_4$ crystals to better understand the behaviour of the rare-earth ions in these hosts and to predict their potential laser properties.

In the framework of this project the absorption, emission spectra and luminescence dynamics of excited levels will be measured. On the basis of Judd-Ofelt theory the three intensity Ω_t parameters characterising optical properties of Ho^{3+} ion in SLG and SLO hosts will be evaluated. In the next step the mechanisms of upconversion processes from infrared and red to visible light will be investigated.

[Pro34] **Thermally induced metastability of amorphous silicon** (Termicznie indukowana metastabilność krzemu amorficznego), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Marek Kostana, August 2001 – June 2002

The influence of the doping and hydrogen content on metastable properties of LPCVD amorphous silicon is investigated. Metastability is induced by thermal quenching. Transport parameters of the examined films and the characteristics of thin-film transistors are measured.

[Pro35] **Tunable filters based on dielectric resonators TUF** (Przestrajalne filtry oparte na rezonatorach dielektrycznych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Jerzy Krupka, April 2002 – March 2004

TUF will focus on novel approaches for frequency tuning of dielectric resonators based filters. The project has the following technical objective:

- To provide a tunable dielectric filter capable of satisfying 3 rd, 4 th Generation and satellite requirements.
- To apply tunable dielectric technology to nano-scale detectors.
- To search for new materials and approaches in electronic tuning of dielectric resonators.

[Pro36] **PV-EC-NET - Network for Co-ordination of European and National RTD Programmes for Photovoltaic Solar Energy** (Zespół do Koordynacji Europejskiego i Krajowych (Krajów UE) Programów Rozwoju Fotowoltaicznej Energii Słonecznej SPUB-M), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Stanisław M. Pietruszko, June 2002 – December 2003

The main goal of PV-EC-NET is to increase the efficiency and coherence of the PV RTD Programmes of the EU and the independent EU member- and associated states. Project complementary to the project granted by European Commission 5 Framework Programme on RTD (NNE5-2001-00201).

[Pro37] **PVNET - Photovoltaic Network** (Sieć fotowoltaiki SPUB-M.), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Stanisław M. Pietruszko, June 2002 – December 2003

The main objective of PVNET is the development of a roadmap for PV R&D based on a broad consensus among the different technologies, among industry and research institutions, across the whole range from materials to systems. Project complementary to the project granted by European Commission 5 Framework Programme on RTD (NNE5-2000-00548)

[Pro38] **Determination of UV light generation conditions in active Nd^{3+} doped fibres** (Określenie warunków generacji promieniowania z zakresu ultrafioletu w światłowodach aktywnych domieszkowanych jonami Nd^{3+}), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Ryszard Piramidowicz, co-workers: Wiesław Woliński, Michał Malinowski, Marcin Kaczkan, Paweł Szczepański, November 2002 – November 2004

In the last few years an increasing number of laboratories world-wide have become involved in research and development of optical active fibre devices. Narrow-band, single mode fibre lasers are being developed as potential sources for a wide range of applications. One of the most intensively investigated are short wavelength fibre lasers, especially based on up-conversion pumping mechanisms.

The main objective of this research project is to design and investigate neodymium doped ZBLAN fibre laser operating in the ultra-violet region of spectrum. In particular – the project covers study of one and two-photon excitation of UV emission in Nd^{3+} doped ZBLAN samples, determination of up-conversion mechanisms, analysis of main deactivation processes (both radiative and nonradiative), modelling of laser action threshold parameters and, finally, lasing experiments.

[Pro39] **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.

[Pro40] **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.

4.3. Projects Granted by International Institutions

[Pro41] **Investigations of degradation phenomena in termistors with negative thermal coefficient of resistance** (Badanie zjawisk starzeniowych termistorów z ujemnym temperaturowym współczynnikiem oporności) Institute of Materials of Science-Production Company „Karat", Lvov, Ukraine project leader: Julitta Pogorzelska, co-worker: Józef Maciak, April 1998 – April 2002

The aim is technology development, investigation of physical phenomena in materials is long time period and finding materials with small degradation, which will enable correct element technology.

[Pro42] **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.

[Pro43] **Metastability in Amorphous Silicon** (Metastabilność w krzemie amorficznym), (MEN/DOE-98-345) from U.S. Department of Energy and Polish Ministry of National Education in co-operation with the National Renewable Energy Laboratory, Golden, CO, USA (Maria Sklodowska-Curie Joint Fund II), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Stanisław Pietruszko, 1999 – 2002

This project is directed at understanding the basic phenomena that limit the performance and reliability of thin-film amorphous solar cells. It is addressing a key fundamental research problem involving the degradation behaviour of amorphous silicon. Investigation of the thermally and charge-induced metastability in unhydrogenated and hydrogenated undoped and doped amorphous silicon.

[Pro44] **High beam quality UV lasers for microelectronics** (Opracowanie ultrafioletowych laserów generujących wysokiej jakości wiązki promieniowania dla zastosowań w mikroelektronice), NATO Science for Peace Programme, Project NATO-SfP-971989-Excimer Lasers, project co-director: Tadeusz M.Adamowicz, co-workers: Krzysztof Dzięciołowski, Wojciech Kwaśniewski, Wojciech Kamiński, Jerzy Kęsik, Piotr Warda, May 1999 – April 2004

The Project other partners are as follow:

Department of Laser Physics of the Institute for Solid State Physics and Optics of the Hungarian Academy of Sciences, (Hungary).

- Department of Experimental Physics of Szeged University, (Hungary).
- Metal Vapour Laser Department of the Institute of Solid State Physics of the Bulgarian Academy of Sciences, (Bulgaria).
- -Ruhr-University Bochum, Arbeitsgruppe fur Grundlagen der Elektrotechnik, (Germany).
- Department of Physics, Eindhoven University of Technology, (The Netherlands).
- Centre de Physique des Plasmas et Applications de Toulouse (SPAT), (France).
- Department of Chemistry, University of Antwerp, (Belgium).
- Lasram Laser Ltd., Budapest (Hungary)
- Zakład Ceramiki Specjalnej WACER W.Bujnowski, (Poland).

The main objective of this project is to R&D noble gas-metal vapour ion lasers operating on the UV CuII 248,4 nm transition (Ne-Cu, Ne-CuBr lasers) and ZnII (potential laser transitions of 210 and 193 nm in Ne/He-Zn mixtures). The lasers will be used as oscillators for excimer amplifiers (KrF and ArF) providing good quality laser beam for photolithography of VLSI systems, as well as for deep UV laser spectroscopy.

[Pro45] **Numerical modelling of the chosen devicesfor measuring of electromagnetic properties of the electronic materials** (Modelowanie numeryczne wybranych urządzeń do pomiaru elektromagnetycznych właściwości materiałów elektronicznych), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics and NIST USA, project leader: Jerzy Krupka, co-worker: Zbigniew Rudkowski, financial support: M. Skłodowska - Curie Fund II (Fundusz polsko - amerykańskiej Fundacji im. M. Skłodowskiej - Curie), June 2001 - April 2002

The objective of this project is numerical modelling of the chosen devices for measurements of electromagnetic properties of dielectric and superconducting materials at cryogenic temperatures and microwave frequencies. The measurement programs proposed in this project will be directed at future commercial applications of dielectric and superconducting materials for both the Polish and American electronic industries. The applied research aspects of this work will be the development of new, accurate measurement methods of materials that can be used and properly qualified for total measurement uncertainties, as commercial standards.

[Pro46] **The new generation (Zr, Ca, Sr, Ba) TiO_2 – based dielectric layers for microelectronics**, The Polish-British Research Partnership Programme, WAR/341/221, project leader: Jan Szmidt, 2001 – 2002

The project regards obtaining and characterisation of new generation high-k (Zr,Ca,Sr,Ba)TiO_2-based dielectric layers for microelectronics. They will be obtained by means of Electrostatic Spray Assisted Vapour Deposition technique at the University of Nottingham, Nottingham, UK, on Si substrates selected and prepared at the Institute of Microelectronics and Optoelectronics, Warsaw. Subsequently, obtained structures will be characterised in order to determine possibilities of their (as well as their technology) application in manufacturing of microelectronic structures (MIS transistors, DRAM structures).

[Pro47] **PVNET - Photovoltaic Network** (Sieć fotowoltaiki), Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, project leader: Stanisław M. Pietruszko, 5 European Union Grants Commitee UE, project no NNE5-2000-00548, 2001 - 2003

PVNET will bring together representatives of relevant R&D and production areas in photovoltaics. Their main task is to stimulate communication within the whole PV community by organizing expert meetings, workshops and symposia and disseminating the information gathered therein. The main objective of PVNET is the development of a roadmap for PV R&D based on a broad consensus among the different technologies, among industry and research institutions, across the whole range from materials to systems.

[Pro48] **ENERBUILD—Network Energy in the Built Environment** (Sieć Energia w Budownictwie), European Commission 5 Framework Programme on RTD (ERK6-CT-1999-20001), project leader: Stanisław M. Pietruszko, October 2002 – March 2003

The EnerBuild RTD Thematic Network has the following objectives: delivering the results of past and current research to potential users in the most important sectors with the greatest dissemination potential, with the overall objective of reducing emissions and improving the energy efficiency of the built environment in Europe, facilitating collaboration and exchange among EC-supported research projects, helping maintain the technical and industrial content of future European energy-related building research and to help identify research priorities forming links with relevant targeted RD&D actions and other Thematic Networks with a view to maximising the effectiveness of the problem-solving effort, encouraging the formation of new RTD partnerships between stakeholders in construction, evaluating the effectiveness of different disseminating strategies and media

[Pro49] **PV-EC-NET - Network for Co-ordination of European and national RTD Programmes for Photovoltaic Solar Energy** (Koordynacja Europejskiego i Krajowych (Krajów UE) Programów Rozwoju Fotowoltaicznej Energii Słonecznej), European Commission 5 Framework Programme on RTD, project no NNE5-2001-00201, project leader: Stanisław M. Pietruszko, January 2002 – June 2003

The project will bring together the co-ordinating institutions of the national PV RTD programmes of the member- and associated states of the European Union. The main goal of PV-EC-NET is to increase the efficiency and coherence of the PV RTD Programmes of the EU and the independent EU member- and associated states (hereafter indicated as 'EU and national PV RTD programmes'). PV-EC-NET will therefore collect, analyse and disseminate the information about these EU and national PV RTD programmes. This should be achieved by establishing a Central European PV Information Centre, which will be given the task to co-ordinate the collection, processing and dissemination of this information, resulting in a commonly shared European PV Road Map.

[Pro50] **REASON (Research and Training Action for System on Chip Design),** (Badania i szkolenia w zakresie projektowania systemów jednoukładowych) (IST–2000-30193), project co-ordinator: Wiesław Kuźmicz (Warsaw University of Technology, Poland), project partners: 22 partners from EU member states and from Central and Eastern Europe, January 2002-December 2004,

The goal of this project is to facilitate integration of the academic and research institutions of Central and Eastern Europe working in the field of microelectronics into the mainstream R&D activities going on in the EU countries. The main objectives of the project are as follows:

- Raising the level of awareness of industrial problems and the level of competencies among researchers in CEE in methodologies of system-on-chip design and test and analogue and mixed signal IC design for wireless communication, networking, and multimedia.
- Strengthening of links between academic and industrial partners, in order to facilitate formulation of new RTD projects and formation of project consortia.

- Maintaining and expanding the research infrastructure in the academic and research institutions of Central and Eastern Europe.
- Knowledge transfer to the SMEs and raising the level of awareness of the IST programme, in order to facilitate participation of SMEs in FP5 and the next Framework Programme projects.

[Pro51] **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

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.

4.4. Other Projects

[Pro52] **Microsystems - construction, technology, design. Humidity sensor based on silicon** (Mikrosystemy – konstrukcje, technologie, projektowanie. Czujnik wilgotności w oparciu o strukturę krzemu porowatego), project leader: Romuald B. Beck, co-workers: Andrzej Jakubowski, Bogdan Majkusiak, Jan Szmidt, Aleksander Werbowy, Lidia Łukasiak, Sławomir Szostak, Jan Gibki, Agnieszka Zaręba, Jakub Walczak, Witold Ciemiewski, Kazimierz Dalbiak, Małgorztata Trzaskowska, June 2002 – June 2003.

Bussing on the experience accumulated design previous works – the technology of humidity sensor manufacturing is experimentally studies. The sensor with very thin nano-porous silicon layer is expected to allow resistance or capacitance dependence on humidity of ambient atmosphere.

5. DEGREES AWARDED

5.1. D.Sc. Degrees

[DSc1] Lidia Łukasiak, **Models and electrical methods of characterization od MOS and MOS SOI devices,** (Modele i elektryczne metody charakteryzacji przyrządów MOS i MOS SOI), 18 June 2002

5.2. Ph.D. Degrees

[PhD1] Agata Jasik, **Epitaxial growth and characterization of the pseudomorphical heterojunction structure InAlAs/InGaAs/InP for applications in HEMT transistors,** (Wzrost epitaksjalny i charakteryzacja pseudomorficznej struktury heterozłączowej InAlAs/InGaAs/InP stosowanej w tranzystorach HEMT), supervisor: Jerzy Kruszewski, 29 January 2002

[PhD2] Kamil Kosiel, **Technology of Low-Pressure Vapour Phase Epitaxy with metal-organic precursors for A3B5 semiconductor heterostructures in nanoelectronics** (Technologia nieskociśnieniowej epitaksji z fazy gazowej z wykorzystaniem prekursorów metaloorganicznych dla realizacji heterostruktur półprzewodnikowych A^3B^5 do zastosowań w nanoelektronice), supervisor: Bogdan Majkusiak, June 2002

[PhD3] Tomasz Kossek, **Modelling of nonlinear operation of circular grating DBR planar laser**(Modelowanie ponadprogowej generacji promieniowania w planarnym laserze DBR o symetrii kołowej), supervisor: Paweł Szczepański, 5 November 2002

[PhD4] Zenon Szczepaniak, **The methods of optical synchronization and modulation of microwave oscillators frequencies**, (Metody optycznej synchronizacji i modulacji częstotliwości oscylatorów mikrofalowych), supervisor: Bogdan Galwas, 19 March 2002

[PhD5] Jakub Walczak, **Modelling of scattering of electrons in a thin semiconductor layer of GAA SOI transistor** (Modelowanie rozpraszania elektronów w cienkiej warstwie półprzewodnika tranzystora GAA SOI), supervisor: Bogdan Majkusiak, 04 June 2002

[PhD6] Artur Wnuk, **Avalanche process in holmium activated laser solids** (Zjawisko lawinowe w materiałach laserowych domieszkowanych holmem), supervisor: Michał Malinowski, 3 December 2002

5.3. M.Sc. Degrees

[MSc1] Krzysztof Baran, **Modelowanie generacji półprzewodnikowego lasera telekomunikacyjnego,** advisor Piotr Witoński, very good

[MSc2] Tomasz Bieniek, **Niskotemperaturowe procesy wytwarzania ultracienkich warstw SIO2 na potrzeby technologii MOS-VLSI,** advisor Romuald Beck, very good

[MSc3] Tomasz Cygielski, **Łącza optyczne ultrakrótkich odległości,** p advisor Bogdan Galwas, very good

[MSc4] Joseph Dinha, **Global maze router for CAD design of asics,** advisor Adam Wojtasik, fairly good

[MSc5] Emil Dusiński, **Tranzystor MIS z warstwą Al2O3 jako dielektrykiem bramkowym - technologie i charakteryzacje,** advisor Jan Szmidt, excellent

[MSc6] Robert Gielmuda, **Studium projektowe światłowodowo - radiowej telekomunikacji ruchomej na pasmo 46 GHz,** advisor Bogdan Galwas, very good

[MSc7] Dariusz Główczyński, **Sieci neuronowe w zdalnym rozpoznawaniu kształtów,** advisor Mikołaj Baszun, very good

[MSc8] Robert Iwanek, **Porównanie parametrów elektroakustycznych wzmacniaczy małej częstotliwości półprzewodnikowych i lampowych,** advisor Stefan Misiaszek, very good

[MSc9] Andrzej Kociubiński, **Charakteryzacja struktur próbnych zrealizowanych w technologii SOI,** advisor Andrzej Jakubowski, very good

[MSc10] Zenon Kopeć, **Światłowodowy czujnik chropowatości powierzchni,** advisor Maria Bebłowska, very good

[MSc11] Tomasz Korcz, **Zastosowanie metod morfologii matematycznej do oceny jakości maski cieniowej kineskopu,** p advisor Jerzy Woźnicki, very good

[MSc12] Mirosław Kuczkowski, **Cyfrowe realizacje sterowników rozmytych o programowalnych charakterystykach przejściowych,** advisor Zbigniew Jaworski, good

[MSc13] Hubert Maćkowski, **Opracowanie konstrukcji i technologii piezorezystywnego grubowarstwowego czujnika pomiaru siły,** advisor Zbigniew Szczepański, good

[MSc14] Wojciech Matysik, **Wspomaganie obliczeń numerycznych metody sprzężonych gradienów przy użyciu systemu mikroprocesorowego,** advisor Andrzej Pfitzner, excellent

[MSc15] Tomasz Pawłowski, **Wieloużytkownikowy system analizy i przetwarzania obraów cyfrowych na platformie JAVA 2,** advisor Grzegorz Kukiełka, excellent

[MSc16] Adam Piotrowski, **Modyfikacja konstrukcji detektora długofalowego promieniowania podczerwonego dla telekomunikacji optycznej,** advisor Jerzy Kalenik, excellent

[MSc17] Karol Płochocki, **Pomiary zespolonej przenikalności elektrycznej cienkich warstw dielektrycznych w paśmie mikrofalowym,** advisor Jerzy Krupka, good
[MSc18] Tomasz Pomorski, **Analiza algorytmów kryptograficznych dla układów bezkontaktowych,** advisor Witold Pleskacz, very good
[MSc19] Paweł Popow, **Badanie kierunkowości i skuteczności promieniowania stacji bazowej systemu GSM,** advisor Mikołaj Baszun, good
[MSc20] Piotr Ratajczak, **Analiza wpływu pola magnetyzmu ziemskiego na błąd padania wiązki elektronowej w kineskopie kolorowym,** advisor Hanna Górkiewicz-Galwas, good
[MSc21] Jacek Rosiak, **Metody realizacji algorytmów kryptograficznych w układach bezkontaktowych,** advisor Elżbieta Piwowarska, very good
[MSc22] Andrzej Rutkowski, **Analiza właściwości różnych modów AFP w podłożach piezoelektrycznych,** advisor Mikołaj Baszun, good
[MSc23] Łukasz Sobczyk, **Segmentacja obrazów cyfrowych i estymacja parametrów obszarów z wykorzystaniem metod morfologii matematycznej,** advisor Hanna Górkiewicz-Galwas, fairly good
[MSc24] Mariusz Sochacki, **Wpływ obróbki termicznej na właściwości diod Scholtky'ego na węgliku krzemu,** advisor Jan Szmidt, excellent
[MSc25] Jarosław Stępień, **Badanie możliwości wykorzystania światłowodu do konstrukcji czujnika rosy,** advisor Jerzy Kalenik, fairly good
[MSc26] Marta Szachowicz, **Analiza warunków pracy i badanie mikrolaserów z ND:YAG,** advisor Michał Malinowski, excellent
[MSc27] Artur Szczęsny, **Plazmowe procesy trawienia warstw GaN na podłożu szafirowym,** advisor Jan Szmidt, very good
[MSc28] Sławomir Ślarzyński, **Mikrofalowy, odbiciowy przesuwnik fazy sterowany optycznie,** advisor Bogdan Galwas, very good
[MSc29] Mateusz Śmietana, **Badanie możliwości wykorzystania światłowodu grubowarstwowego w zastosowaniach czujnikowych,** advisor Jerzy Kalenik, very good
[MSc30] Antoni Warszawik, **Opracowanie systemu pomiarowego i analiza pracy wolnostojącego systemu PV,** advisor Stanisław Pietruszko, very good
[MSc31] Paweł Zajączkowski, **Badania połączeń flip chip realizowanych przy zastosowaniu klejów anizotropowych,** advisor Zbigniew Szczepański, excellent
[MSc32] Tomasz Zychowicz, **Zaptojektowanie i wykonanie mikrofalowego czujnika wilgotności drewna,** advisor Jerzy Krupka, very good

5.4. B.Sc. Degrees

[BSc1] Wojciech Barszczewski, **Uproszczona metoda montażu flip-chip kompatybilna z SMT,** advisor Grzegorz Kukiełka, good
[BSc2] Andrzej Berent, **Zwrotnica antenowa - projekt, wykonanie i badanie modelu,** advisor Jerzy Skulski, good
[BSc3] Robert Bojarski, **Zastosowanie trawienia typu MESA do wytwarzania styruktur testowych dla technologii MOS-SOI,** advisor Romuald Beck, good
[BSc4] Sławomir Brzozowski, **Multiplexer częstotliwościowy do łącza optycznego - projekt, wykonanie i badania,** advisor Jerzy Piotrowski, good
[BSc5] Michał Cuch, **Osadzanie warstw tlenko-azotków (sioxny) w plazmie metodą PECUD,** advisor Romuald Beck, very good
[BSc6] Tomasz Derdej, **Zastosowanie częstotliwościowych metod filtracji do usuwania zniekształceń o znanych parametrach,** advisor Grzegorz Kukiełka, fairly good
[BSc7] Piotr Firek, **Charakteryzacja przyrządów MIS z dielektryczną warstwą BN,** advisor Aleksander Werbowy, very good
[BSc8] Grzegorz Głuszko, **Charakteryzacja struktór półprzewodnikowych typu MOS,** advisor Andrzej Jakubowski, good
[BSc9] Konrad Grajwoda, **Sterowanie systemu pomiarowego do diagnostyki struktur półprzewodnikowych,** advisor Lidia Łukasia,k good
[BSc10] Katarzyna Grzesiczak, **Modelowanie przyrządów z sige - parametry statyczne,** advisor Andrzej Jakubowski, fairly good
[BSc11] Hubert Kamiński, **Symulacja komputerowa pracy dynamicznej laserów DFB/DBR o symetrii kołowej,** advisor Agnieszka Mossakowska-Wyszyńska, good
[BSc12] Robert Karlikowski, **Sterownik lasera - projekt, wykonanie i badanie,** advisor Piotr Witoński, very good
[BSc13] Krzysztof Kliczek, **Opracowanie metody mikromontażu włókien w przełączniku światłowodowym,** advisor Jerzy Kruszewski, very good
[BSc14] Mariusz Klimczak, **Opracowanie modelu laboratoryjnego lasera Nd:YAG z powielaniem częstotliwości pompowanego diodą laserową,** advisor Ryszard Piramidowicz, very good
[BSc15] Adam Kolendo, **Właściwości kontaktów metali trudnotopliwych do półprzewodników,** advisor Aleksander Werbowy, good
[BSc16] Artur Marcin Kot, **Analiza warunków pracy światłowodowych czujników transmisyjnych,** advisor Jerzy Kruszewski, very good
[BSc17] Radosław Kreft, **Opracowanie stanowiska pomiarowego do badania wpływu odkształceń powierzchni na właściwości transmisyjne włókna światłowodowego,** advisor Jerzy Kruszewski, very good
[BSc18] Marcin Lubiak, **Badanie parametrów mikrofalowych i wytrzymałości mechanicznej złącza klejowego falowód-dielektryk w czasie transmisji mocy na pasmo S w funkcji temperatury,** advisor Ryszard Kisiel, good
[BSc19] Radosław Łukasiewicz, **Właściwości temperaturowe sio2 na węgliku krzemu,** advisor Jan Szmidt, very good
[BSc20] Paweł Makówka, **Implementacja szybkich układów sumujących w technologii CMOS,** advisor Mirosław Grygolec, good

[BSc21] Adam Malinowski, **Program optymalizacji wymiarów buforów i połączeń dla układów VLSI,** advisor Elżbieta Piwowarska, good

[BSc22] Michał Marchlewski, **Analiza rozkładów temperatur w wielowarstwowych strukturach przewodząco – rezystywnych,** advisor Ryszard Kisiel, fairly good

[BSc23] Artur Markowski, **Badanie właściwości eksploatacyjnych "przelotek" na płytkach drukowanych wykonywanych klejami elektrycznie przewodzącymi,** advisor Ryszard Kisiel, good

[BSc24] Grzegorz Mazur, **Wrażlliwość parametrów przepływu gazu od wybranych procesów zakłócających stan na przykładzie układu o symetrii cylindrycznej,** advisor Piotr Szwemin, good

[BSc25] Marek Mikucki, **Modelowanie częściowo zubożonego tranzystora SOI w zakresie podprogowym,** advisor Lidia Łukasiak, fairly good

[BSc26] Łukasz Młodziński, **Modelowanie właściwości dynamicznych tranzystorów SOI,** advisor Lidia Łukasiak, good

[BSc27] Wojciech Moćko, **Opracowanie systemu magnesowania próbek dla stanowiska do badań transforamatorów impulsowych (labview),** advisor Janusz Rogowski, good

[BSc28] Robert Mroczyński, **Trawienie plazmowe (RIE) warstw dielektrycznych,** advisor Romuald Beck, very good

[BSc29] Artur Pająk, **Algorytmy obliczeniowe dla struktur z fotoniczną przerwą zabronioną,** advisor Paweł Szczepański, good

[BSc30] Jarosław Piotrowski, **Analiza numeryczna sprawności energetycznej laserów DFB o symetrii kołowej,** advisor Agnieszka Mossakowska-Wyszyńska, very good

[BSc31] Maciej Plona, **Analiza transmisji promieniowania w wielomodowych włóknach optycznych techniką NRT,** advisor Michał Borecki, good

[BSc32] Marek Sałasiński, **Bibioteka dynamicznych komórek standardowych w technologii CMOS,** advisor Mirosław Grygolec, good

[BSc33] Robert Sawicki, **Estymacja parametrów ruchu obiektów za pomocą szybkiego algorytmu zbieżnego dla przypadku płaskiego modelu ruchu,** advisor Grzegorz Kukiełka, good

[BSc34] Adam Smoleński, **Wykonanie i badanie światłowodowego czujnika odkształcenia powierzchni,** advisor Maria Bebłowska, good

[BSc35] Michał Sokołowski, **Analiza schematu elektrycznego układu scalonego pod kątem wykrywania uszkodzeń funkcjonalnych,** advisor Witold Pleskacz, good

[BSc36] Jarosław Sroka, **Klasyfikacja obrazów zawierających tekstury z zastosowaniem modelowania fraktalnego,** advisor Hanna Górkiewicz-Galwas, fairly good

[BSc37] Jędrzej Stęszewski, **Charakterystyki C-V struktur MIS z nową generacją dielektryków,** advisor Andrzej Jakubowski, good

[BSc38] Tomasz Szklarz, **Implementacja i badanie właściwości geodezyjnych filtrów morfologicznych dla przypadku obrazów barwnych,** advisor Grzegorz Kukiełka, good

[BSc39] Rafał Tratkiewicz, **Wykonanie i badanie sprzęgaczy światłowodowych z optycznych włókien polimerowych,** advisor Maria Bebłowska, good

[BSc40] Andrzej Truszczyński, **Symulacja szumów przełączania dla układów cyfrowych w technologii AMSO35,** advisor Elżbieta Piwowarska, good

[BSc41] Michał Wiatroszak, **Wpływ temperatury na właściwości elektryczne cienkich warstw ALN na podłożach półprzeowodnikowych,** advisor Jan Szmidt, good

[BSc42] Robert Wydorski, **Symulacja przepływu gazu rozrzedonego przez diafragmy metrologiczne,** advisor Piotr Szwemin, good

[BSc43] Jarosław Żukowski, **Komórka ramanowska do lasera Nd:YAG - zaprojektowanie, uruchomienie i zbadanie warunków pracy,** advisor Michał Malinowski, good

6. PUBLICATIONS

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

Number	Authors	Journal	Title, volume, pages
[Pub1]	G.Bano, L.Szalai, P.Horvath, K.Kutasi, Z.Donko, K.Rozsa, T.M.Adamowicz	Journal of Applied Physics	Au-II 282 segmented hollow-cathode laser-parametric studies and modelling, vol. 92, No. 11, pp. 6372-6383
[Pub2]	M.Baszun, D.Grzęda	Journal of Materials Processing Technology	Application of shear horizontal surface acoustic waves to thin film evaluation, 5 pages, on-line in Iternet from 31 May
[Pub3]	T.Cibakova, M.Fischerowa, E.Gramatova, W.Kuźmicz, W.Pleskacz, J.Raik, R.Ubar	Microelectronics Reliability (PERGAMON - Elsevier Science)	Hierarchical Test Generation for Combinational Circuits with Real Defects Coverage, vol. 42/7, pp. 1141-1149, July
[Pub4]	J.G.Hartnett, A.N.Luiten, J.Krupka, M.E.Tobar, P.Bilski	J. Phys.D. Appl. Phys	Influence of paramagnetic chromium ions in crystalline YAG at microwave frequencies, vol. 35. ,pp 1459-1466
[Pub5]	J.G.Hartnett, M.E.Tobar, D.Cros, P.Guillon, J.Krupka	IEEE Trans. of Ultrasonic, Ferroelectrics and Frequency Control	High Q-factor Bragg reflection sapphire-loaded cavity $TE_{10\delta}$ mode resonator, Vol.49.,No12, pp.1628-1634
[Pub6]	R.Kisiel	Journal of Electronic Packaging	Electrically Conductive Adhesive Formulations for SMT Applications, Vol.124, pp. 367-370.
[Pub7]	J.Krupka	Materials Science and Engineering B,.	Precise measurements of the complex permittivity of dielectric materials at microwave frequencies, in press
[Pub8]	J.Krupka, J.Mazierska	IEEE Trans. on Microwave Theory Tech	Microwave properties of low-loss polymers at cryogenic temperatures, vol. 50 No 2, pp.474-480
[Pub9]	W.Kwaśniewski, K.Dzieciołowski, T.M.Adamowicz	Acta Physica Polonica A	Measurements of Cu atoms diffusion coefficient in He and Ne - optimalisation of a novel method, vol.102, No 6, pp. 747-757
[Pub10]	S.H.Lim, H.S.Kim, C.H.Lee, S.M.Pietruszko, J.Jang	Journal of Non-Crystalline Solids	High stability of emission current for a new carbon nanostructure film, Vol. 299 –302 pp.864 –867
[Pub11]	S.Malyshev, B.Galwas, J.Piotrowski, A.Chizh, Z.Szczepaniak	IEEE Microvawe and Wireless Components Letters	Photovaractor fo Remote Optical Control of Microwave Circuits, vol.12, no.6, pp. 201-203
[Pub12]	A.Mossakowska-Wyszyńska, P.Witoński, P.Szczepański	Applied Optics	Relaxation oscillations in a laser with Gaussian mirror, vol.41, no.9, pp. 1668-1676
[Pub13]	M.Niewiński, P.Szwemin	Vacuum	Moly Flow..er for Windows – a computer program for precision calculations of transmission probability Vacuum vol.67 No 3-4, pp. 327-332
[Pub14]	S.M.Pietruszko	Applied Energy	Photovoltaics in Poland, (2002), 7 pages
[Pub15]	S.M.Pietruszko, M.Grądzki	Applied Energy	Performance of the grid connected small PV system in Poland, 8 pages
[Pub16]	S.M.Pietruszko, J.Jang	Solar Energy Materials and Solar Cells	Effect of Hydrogen on Stability of Amorphous Silicon Thin Films, Volume 71, Issue 4, pp. 459-464
[Pub17]	M.Sochacki, J.Szmidt, A.Werbowy, M.Bakowski	Diamond and Related Materials	Influence of annealing on reverse current of 4H – SiC Schottky diodes, 11, pp.1263 – 1267
[Pub18]	P.Szwemin, M.Niewiński	Vacuum	Comparison of transmission probabilities calculated by Monte Carlo simulation and analytical methods, vol.67 No 3-4, pp. 359-362
[Pub19]	D.Tomaszewski, K.Domański, L.Łukasiak, A.Zaręba, J.Gibki, A.Jakubowski	Progress in SOI Structures and Devices Operating at Extreme Conditions, Kluwer Academic Publ. (Eds. F.Balestra, A. Nazarov, V.S. Lysenko), NATO Science Series	DC and AC models of partially-depleted SOI MOSFETS in weak inversion, pp. 289 – 297.

1 Institute for Scientific Information (Philadelphia, USA)

[Pub20]	A.Wnuk, M.Kaczkan, Z.Frukacz, I.Pracka, G.Chadeyron, M.-F.Joubert, M.Malinowski	J. Alloys and Compounds	Infra-red to visible up-conversion in holmium doped materials, 341, pp. 353-357
[Pub21]	A.Wnuk, M.Kaczkan, R.Piramidowicz, R.Mahiou, G.Bertrand. M.-F.Joubert, M.Malinowski	Radiation Effects & Defects in Solids	Dynamics of the up-conversion emission in holmium doped ZBLAN fiber, in press

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

Number	Authors	Journal	Title, volume, pages
[Pub22]	T.Bieniek, A.Wojtkiewicz, L.Łukasiak, R.B.Beck	Journal of Wide Bandgap Materials	Silicon dioxide as passivating, ultrathin layers in MOSFET gate stacks, vol.8, No. 3-4 (2001) 201 – 209. (2002 sage publications).
[Pub23]	J.Bodzenta, B.Burak, J.Mazur, J.Szmidt	Journal of Wide Bandgap Materials	Thermal properties of CN thin films measured by photothermal methods, vol.8, No. 3-4 (2001) 233 – 239. (2002 sage publications)
[Pub24]	M.Borecki, J.Kruszewski	Elektronizacja	Inteligentny czujnik światłowodowy do badań stężeń roztworów, No 7-8, pp.48-50
[Pub25]	J.Chęć, M.Pajer, B.Galwas	Journal of Telecommunications and Information Technology	New multimedia and telematic tools for asynchronous distance learning, No 1/2002, pp. 65-70
[Pub26]	J.Dawidczyk, B.Galwas, J.Skulski, Z.Szczepaniak, H.Gruchała, S.Malyshev	Journal of Telecommunications and Information Technology	Optical-microwave transmission system with subcarrier multiplexing for industrial measurment systems, No 1/2002, pp. 18-21
[Pub27]	E.Dusiński, J.Szmidt, K.Zdunek, M.Elert, A.Barcz	Journal of Wide Bandgap Materials	Al_2O_3 layers for microelectronics applications, vol.9, No. 1-2 (2001) 109 – 116. (2002 sage publications)
[Pub28]	M.Gałązka, J.Szmidt, A.Werbowy	Journal of Wide Bandgap Materials	The influence of RF plasma processes on nitride (BN, AlN, GaN) layers, vol.9, No. 3, pp.207 – 212
[Pub29]	T.Grudniewski, J.Parka, R.Dąbrowski, A.Januszko,A.Miniewicz	Opto-Electronics Review	Investigations of the diffraction efficiency in dye-doped LC cells under low frequency AC voltage, vol.10, no. 1, pp.11-15
[Pub30]	T.Grudniewski, J.Parka, M.Sutkowski, A.Miniewicz	Biuletyn WAT	The digital holograms projected onto LC cells, Vol. LI, no. 1, pp. 121-131
[Pub31]	T.Guzdek, M.Cłapa, J.Szmidt	Journal of Wide Bandgap Materials	Dielectric properties of NCD films in sensor applications, vol.9, No. 3, pp. 163 – 168
[Pub32]	M.T.Htun Aung, J.Szmidt, M.Bakowski	Journal of Wide Bandgap Materials	The study of thermal oxidation on SiC surface, vol.9, No. 4, pp. 313 – 318
[Pub33]	A.Jakubowski, L.Łukasiak, J.Szmidt	Elektronika	Mikroelektronika – materiały i przyrządy, (XLIII) 7-8'2002, pp. 5 – 8.
[Pub34]	K.Klimczak, J.Szmidt, A.Olszyna, M.Bakowski, A.Barcz	Journal of Wide Bandgap Materials	Basic properties of AlN layers deposited onto SiC, vol.9, No. 4, pp. 335 – 341
[Pub35]	K.Kosiel, L.Dobrzański, B.Majkusiak, A.Jasik	Journal of Wide Bandgap Materials	MOVPE Deposition of AlAs/$In_{0.53}Ga_{0.47}As$/InP resonant tunneling heterostructure performing high PVR parameter, vol.9, No. 1-2 (2001) 93 – 100. (2002 sage publications)
[Pub36]	M.Niewiński	Zeszyty Naukowe PW seria Elektronika	Środowisko obliczeń rozproszonych w zastosowaniu do wyznaczania parametrów układów metrologicznych metodą Monte-Carlo, Nr 147 pp.189-192,
[Pub37]	A.Pfitzner, E.Piwowarska, W.Pleskacz	VISNIK Derzavnogo universitetu "Lvivska politechnika" – Radioelektronika ta Telekomunikacji, Lviv, ISSN 0321-0499	Multimedia Manual for Distance Learning in Technical University, no. 443, pp. 234-239
[Pub38]	W.Skarbek, G.Kukiełka	Machine GRAPHICS & VISION	Optimal Intervals for Fuzzy Categories of Color Temperature with Application to Image Browsing, vol. 11, No 2/3, pp. 297-310
[Pub39]	M.Sochacki, J.Szmidt, A.Werbowy, M.Bakowski	Journal of Wide Bandgap Materials	Current-voltage characteristics of 4H-SiC diodes with Ni contacts, vol.9, No. 4, pp. 307 – 312
[Pub40]	A.Szczęsny, J.Szmidt, R.B.Beck	Journal of Wide Bandgap Materials	Physical-chemical etching of GaN layers on sapphire, vol.9, No. 3, pp. 185 – 190

[Pub41]	Z.Szczepański	Elektronika	Problemy z technologią montażu flip chip na podłożach polimerowych, No 1, pp. 7-13
[Pub42]	P.Szwemin	Zeszyty Naukowe PW seria Elektronika	Charakteryzacja wzorca wysokiej próżni z dynamiczną ekspansją gazu w oparciu o model globalny, No 147, pp.33-44
[Pub43]	P.Szwemin, K.Szymański	Zeszyty Naukowe PW seria Elektronika	Rozkłady powierzchniowe strumienia gazu na ścianach komory kalibracyjnej w układach z dynamiczną ekspansją gazu, No 147, pp.105-109
[Pub44]	P.Śniecikowski, J.Szmidt, M.T.Htun Aung, M.Bakowski, P. Niedzielski	Journal of Wide Bandgap Materials	Dry etching of bulk 4H-SiC and DLC/Sic structure, vol.9, No. 4, pp. 319 – 324
[Pub45]	A.Werbowy, P. Firek, J.Szmidt, M.Gałązka, A.Olszyna	Journal of Wide Bandgap Materials	Electric characterization and plasma etching of nanocrystalline c-BN layers, vol.9, No. 3, pp. 169 – 176
[Pub46]	J. Woźnicki	„NAUKA" – Polska Akademia Nauk Kwartalnik	Rola uczelni akademickich w polityce naukowej, vol. 4, pp. 49-55
[Pub47]	J. Woźnicki, R. Morawski	UNESCO-CEPES, Higher education	Public and private higher education institutions – joint or seperate evaluation and ranking. The Polish perspective,vol.XXVII, no. 4, in press

6.3. Scientific and Technical Papers Published in Conference Proceedings

Number	Authors	Conference	Title, volume, pages
[Pub48]	T. Adamowicz	Proc. of VII Sympozjum Techniki Laserowej, Szczecin-Świnoujście, Poland	Ośrodki laserujące na mieszaninach gazów szlachetnych i par metali, vol. R, pp. 35-44
[Pub49]	T.M.Adamowicz, Z.Donko, W.Kwaśniewski, K.Dzieciołowski, G.Bano, K.Rozsa	Proc of EGAS 3, 34th Int. Conference of European Group for Atomic Spectroscopy, Sofia, Bulgaria	Diffusion of metal atoms in noble gases studied by double-pulse excitation of a hollow cathode discharge, vol. 26C, pp.34-35
[Pub50]	T.M.Adamowicz, K.Dzięciołowski, W.Kamiński	Proc. of VII Sympozjum Techniki Laserowej, Szczecin-Świnoujście, Poland	Badania procesów elementarnych w wyładowaniu Ne-Ar przy użyciu laserowego efektu optogalwanicznego, vol. K, pp. 373-378
[Pub51]	M.Borecki	Proc. VIII Konferencja Światłowody i ich zastosowanie, Poland, Białowieża	Analiza warunków pracy głowicy inteligentnego światłowodowego czujnika rodzaju ciecz, pp.49-52
[Pub52]	M.Borecki	Proc. VIII Konferencja Światłowody i ich zastosowanie, Poland, Białowieża	Propagacja światła na zagięciach w światłowodach polimerowych, pp.53-56
[Pub53]	M.Borecki, J.Kruszewski	Proc. VIII Konferencja Światłowody i ich zastosowanie, Poland, Białowieża	Analiza warunków pracy mikroprzełącznika światłowodowego, pp.41-44
[Pub54]	M.Borecki, J.Kruszewski	Proc. VII Konferencja Naukowa Czujniki optoelektroniczne i elektroniczne, Poland, Rzeszów	Inteligentny czujnik światłowodowy do badania stężeń roztworów, pp.107-110
[Pub55]	M.Borecki, J.Kruszewski, P.Wrzosek	Proc. VIII Konferencja Światłowody i ich zastosowanie, Poland, Białowieża	Dedykowane zasilacze diod laserowych na potrzeby światłowodowych czujników natężeniowych, pp.37-40
[Pub56]	M.Borecki, P.Wrzosek J.Kruszewski	Proc. VIII Konferencja Światłowody i ich zastosowanie, Poland, Białowieża	Modele funkcjonalne diod laserowych, pp.45-48
[Pub57]	P.Brzozowski, J.Piotrowski, A.Jakubowski	Proc. I Krajowa Konferencja Elektroniki, Poland	Komputerowa symulacja i optymalizacja niechłodzonych fotodetektorów długofalowego promieniowania podczerwonego, pp. 185 - 190
[Pub58]	B.Czejdo, Ch.Eick, R.Mappus, M.Baszun	Proc.14-th International Conference on System Reaserch, Informatics	Data Warehouse Support for Team-Based Cooperation in Software Developement, pp. 83-90
[Pub59]	P.Czuma. P.Szczepański	Proc. of VII Sympozjum Techniki Laserowej, Szczecin-Świnoujście, Poland	Nasycenie wzmocnienia w jednowymiarowym krysztale z fotonowa przerwą zabronioną, vol. K, pp. 123-125
[Pub60]	P.Czuma. P.Szczepański	Proc. of ICCDCS'2002 Fourth IEEE Int. Conference on Devices, Circuits and Systems, Aruba, Dutch Caribben	Analysys of the Gain Effect in One Dimenssion Active Photonic Crystals, CD-ROM proceedings no. D-37, pp. D-037-1 to D037-5

[Pub61]	K.Derzakowski, A.Abramowicz, J.Krupka	Proc. X National Symposium of Radio Science, Poznań, March 14-15, Poland	Accuracy of the permittivity measurements using open dielectric resonators, pp. 341-344
[Pub62]	B.Galwas, J.Barczyk, S.Nowak, E.Piwowarska, R.Rak	Proceedings of the 2002 EDEN Annual Conference, Open and Distance Learning in Europe and Beyond, Granada, Spain, 16-19 June, 2002	Internet and Computer-Based Model of Higher Distance Education Developed by Warsaw University of Technology, pp. 590-595
[Pub63]	B.Galwas, J.Barczyk, S.Nowak, E.Piwowarska, R.Rak	Proceedings of the European Conference: The New Educational Benefits of ICT in Higher Education, Rotterdam, Nederland, 2-4 September 2002	Web-based Model of Engineering Studies Developed by Warsaw University of Technology, pp. 93-96
[Pub64]	B.L.Givot, J.Krupka, K.Derzakowski	Proc XIV Int. Conference MIKON'2002, Gdańsk, Poland, pp.401-403, May 22 - 24, 2002.	Split-Post Dielectric Resonator for Complex Permittivity Measurements at 20-25 GHz, pp. 401-403
[Pub65]	T.Grudniewski, J.Parka	Proc. IV Sympozjum Techniki Przetwarzania Obrazu -TPO2002	Zapis siatek dyfrakcyjnych w cienkich przetwornikach zawierających nematyczne mieszaniny ciekłokrystaliczne o dużej anizotropii optycznej, vol.4, pp.133-137
[Pub66]	T.Grudniewski, J.Parka, R.Dąbrowski, A.Januszko, A.Miniewicz	Proceedings of SPIE for XVI Conference on Liquid Crystals	Investigations of the Diffraction Efficiency in Dye-Doped LC Cells under Low Frequency AC Voltage, vol. 4759, pp. 298-302
[Pub67]	T.Guzdek, J.Szmidt, P.Niedzielski	Proc. I Krajowa Konferencja Elektroniki, Poland	Dyskretne elementy mikroelektroniczne z warstwą węglową chemoczułą, pp. 97 -101
[Pub68]	J.G.Hartnett, A.N.Luiten, J.Krupka, M.E.Tobar, P.Bilski	Workshop on the Applications of Radio Science WARS'2002, Leura, Blue Mountains, NSW, Australia, February 20-22	Microwave Properties of Ultra-Low Loss Chromium-Doped YAG, 6 page paper on CD WARS'2002 Conference Proceedings
[Pub69]	A.Jakubowski, L.Łukasiak, J.Szmidt	Proc. I Krajowa Konferencja Elektroniki, Poland	Mikroelektronika – materiały i przyrządy, pp.15 - 21
[Pub70]	G.Janczyk	Proceedings of the 9th International Conference: "Mixed Design of Integrated Circuits and Systems" - MIXDES 2002, Wrocław, Poland, June 20-22	Selected Physical Mechanisms Present in Bulk and SOI MOSFET Transistors, pp. 479-482
[Pub71]	A.Jarosz, A.Pfitzner	Proceedings of the 9th International Conference: "Mixed Design of Integrated Circuits and Systems" - MIXDES 2002, Wrocław, Poland, June 20-22	Model of the Further Neighbourhood influence on Interconnection Capacitance, pp.463-466
[Pub72]	Z.Jaworski, E.Piwowarska, W.Kuźmicz	Proceedings of the 9th International Conference: "Mixed Design of Integrated Circuits and Systems" - MIXDES 2002, Wrocław, Poland, June 20-22	Pattern Comparator Asic For The Compact Muon Solenoid Experiment In CERN, pp. 325-330.
[Pub73]	W.Kamiński, J.Kęsik	Proc. of VII Sympozjum Techniki Laserowej, Szczecin-Świnoujście, Poland	Rura wyładowcza jonowego lasera argonowego nowej generacji, vol. K, pp. 13-17
[Pub74]	D.Kasprowicz, W.A.Pleskacz	Proceedings of the 9th International Conference: "Mixed Design of Integrated Circuits and Systems" - MIXDES 2002, Wrocław, Poland, June 20-22	Improvement of Integrated Circuit Testing Reliability by Using the Defect Based Approach, pp. 541-544
[Pub75]	R.Kisiel	Proceedings of 26th International Conference and Exhibition, IMAPS - Warsaw, Poland, August 25 - September 7	Meniscographic Method of Investigation of Interfacial Surface Tension between Lead-Free Solders and Fluxes, pp.122-125
[Pub76]	R.Kisiel	Proceedings of European Microelectronics Packaging and Interconnection Symposium, IMAPS Europe, Cracow ,June 2002.	The Influence of Overheating, Flux and Solder Type on Wettability of Lead-Free Solders, pp. 109 -112
[Pub77]	R.Kisiel	Proceedings of 26th International Conference and Exhibition, IMAPS - Warsaw, Poland, August	New Trends in High Density PCB Production and Assembly, pp.6-11

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[Pub78]	R.Kisiel, A.Markowski, M.Lubiak	Proceedings of Polytronic 2002 International IEEE Conference on Polymers and Adhesives in Microelectronics and Photonics, Zalagerszeg, Hungary, June 2002	Conductive Adhesive Fillets for Double Sided PCBs, pp.13 - 16
[Pub79]	A.Kobus, T.Janiszewski, W.Pleskacz, W.Kuźmicz	Proceedings of the 9th International Conference: "Mixed Design of Integrated Circuits and Systems" - MIXDES 2002, Wrocław, Poland, June 20-22	Application Specific Integrated Circuits for Local Industries: The Polish Experience, pp. 133-136
[Pub80]	A.Kolendo, M.Sochacki, J.Szmidt, A.Werbowy	Proc. I Krajowa Konferencja Elektroniki, Poland	Parametry diod Schottky'ego Pt/4H – SiC, pp. 759 – 764.
[Pub81]	T.Kossek, P.Szczepański	Proc. of VII Sympozjum Techniki Laserowej, Szczecin-Świnoujście, Poland	Selekcja modów w planarnym laserze DBR o symetrii kołowej, vol. K, pp. 147-150
[Pub82]	T.Kossek, P.Szczepański, R.Paszkiewicz	Proc. of Conference IQEC/LAT 2002, Moscow, Russia	Bistable operation of circular grating-coupled surface-emitting lasers, No QsuR47
[Pub83]	M.Kostana, S.M.Pietruszko, A.Jakubowski	Proc.Krajowa Konferencja Elektroniki, Kołobrzeg-Dźwirzyno, Poland	Tranzystory cienkowarstwowe z krzemu amorficznego, pp.723-727.
[Pub84]	J.Krupka	Workshop on the Applications of Radio Science WARS'2002, Leura, Blue Mountains, NSW, Australia, February 20-22	Split Post Dielectric Resonators for Measurements of the Complex Permittivity of Laminar Dielectric Materials at Microwave Frequencies, 4 page on CD WARS'2002 Conference Proceedings.
[Pub85]	J.Krupka	XXVII General Assembly of the International Union of Radio Science. Maastricht 17-24 August	Dielectric Measurements on Low-Loss Materials, Contribution (3 pages) published on CD (Commission A)
[Pub86]	J.Krupka, A.Abramowicz, K.Derzakowski	Proc.X National Symposium of Radio Science	Precise measurements of the complex permittivity at microwave frequencies, pp.345-353
[Pub87]	J.Krupka, K.Derzakowski, A.Abramowicz, J.Baker-Jarvis, R.Ono, R.Geyer	XIV Int. Conference MIKON'2002, Gdańsk, Poland, May 22 - 24	Surface impedance measurements of thin high temperature superconducting films with a sapphire dielectric resonator, pp.391-393
[Pub88]	J.Krupka, K.Derzakowski, A.Abramowicz, B.Ridle, J. Baker-Jarvis, R.N.Clarke, O.C.Rochard	Proc. XIV Int. Conference MIKON'2002, Gdańsk, Poland, pp.394-396, May 22 - 24	Bounds on permittivity calculations using the $TE_{01\delta}$ Dielectric Resonator, pp. 394-396
[Pub89]	J.Krupka, M.Janezic	IMAPS, Advanced Technology Workshop on Ceramic Applications for Microwave and Photonic Packaging, Providence, Rhode Island, May 2-3	Non-destructive permittivity measurements of low-loss substrates, Contribution (26 slides) published on CD
[Pub90]	J.Kruszewski, M.Bebłowska M.Borecki,	Proc. VII Konferencja Naukowa Czujniki optoelektroniczne i elektroniczne, Poland, Rzeszów	Światłowodowy czujnik do badania mętności cieczy, pp.49-52
[Pub91]	G.Kukiełka	Proc. IV Sympozjum Techniki Przetwarzania Obrazu - TPO2002	Metody morfologii matematycznej jako narzędzie do analizy danych obrazowych wielowartościowych, vol.4, pp.231-243
[Pub92]	G.Kukiełka, W.Skarbek	Porc. Krajowa Konferencja Radiokomunikacji, Radiofonii i Telewizji KKRRiT 02, Poland	Optymalizacja deskryptora temperarury barwowej obrazu na potrzeby wyszukiwania informacji wizualnych, pp. 131-135
[Pub93]	G.Kukiełka, W.Skarbek	Proc. 12th Portuguese Conference on Pattern Recognition	Optimal Intervals for Fuzzy Categories of Colour Temperature with Application to Image Browsing, (CD-ROM)
[Pub94]	W.Kuźmicz	Proceedings of the 9th International Conference: "Mixed Design of Integrated Circuits and Systems" - MIXDES 2002, Wrocław, Poland, June 20-22	Microelectronics: Manufacturing, Design, Education and the REASON Project, pp. 117-120
[Pub95]	W.Kuźmicz	Proceedings of the EWME-4th European Workshop on Microelectronics Educations, May 23-24, 2002, Spain	Virtual IC Prototyping: A New Teaching Tool, pp. 197-200
[Pub96]	W.Kuźmicz	Proceedings of the eleventh	Microelectronics: manufacturing, design, education and

		International Electrotechnical and Computer Science ERK 2002, Ljubljana, Slovenia, 23-25 Saeptember	the REASON project, vol.A, pp. 3-7
[Pub97]	W.Kwaśniewski, K.Dzięciołowski, T.M.Adamowicz	Proc. of VII Sympozjum Techniki Laserowej, Szczecin-Świnoujście, Poland	Badania dyfuzji atomów metali w gazach szlachetnych w wyładowaniach dla laserów jonowych na parach metali, vol. K, pp. 69-72
[Pub98]	W.Kwaśniewski, K.Dzieciołowski, M.Morzuch, T.Adamowicz	Proc. of 16th Europhysics Conference on Atomic and Molecular Physics of Ionized Gases, Grenoble. France	Diffusion Coefficients of Cu Atoms in He and Ne Measured by Two-Pulse Excitation of a Hollow Cathode Discharge, vol.2, pp.49-50
[Pub99]	J.Laskowski	Proceedings of the 9th International Conference: "Mixed Design of Integrated Circuits and Systems" - MIXDES 2002, Wrocław, Poland, June 20-22	A Modeling of Short Channel Effect Using an Universal Set of MOS Structure Parameters, pp. 413-416
[Pub100]	A.Linkowski, L.Łukasiak, A.Jakubowski	Proc. I Krajowa Konferencja Elektroniki, Poland	Analiza wpływu parametrów tranzystora HBT z bazą SiGe na współczynnik wzmocnienia prądowego, pp. 805 –810
[Pub101]	R.Mahiou, P.Botinaud, G.Bertrand, P.Deren, M.Malinowski	Proc. of Colloque Franco-Polonais Material Science, Physics, Lyon, France	Effect of the one-dimensional structure on fluorescence properties of K2YF5 activated by Ln3+
[Pub102]	M.Malinowski	Proc. of Forum Nauki Polskiej, Londyn, UK	Advanced Solid State Laser and Active Photonic Materials
[Pub103]	M.Malinowski, M.Kaczkan, R.Piramidowicz, A.Wnuk, M-F.Joubert, S.Guy, B.Jacquier, P.Moretti, R.Mahiou, G.Bertrand	Proc. of Colloque Franco-Polonais Material Science, Physics, Lyon, France	Up-conversion in the rare-earth ions activated optical waveguides
[Pub104]	M.Malinowski, R.Piramidowicz, W.Woliński	Proc. of VII Sympozjum Techniki Laserowej, Szczecin-Świnoujście, Poland	Lasery ciała stałegona zakres ultrafioletu, vol.R
[Pub105]	A.Milewski, S.Gawor, M.Tupaj, M.Baszun	Proc. II Krajowa Konferencja "Modelowanie i Symulacja", June, Zakopane, POland	Modelowanie rozkładów pól w rezonatorze piezoelektrycznym, pp.73-80
[Pub106]	A.Milewski, S.Gawor, M.Baszun	Proc. Conferec. Structures - Waves - Biomedical Engineering, ISBN: 83-909641-8-X	Surface acoustic wave wireless sensors, vol. XI, pp. 363 - 366
[Pub107]	P.Moretti, M.-F.Joubert, S.Tascu, B.Jacquier, M.Kaczkan, M.Malinowski, J.Sarnecki	Proc. of Europhysical Conference on Defects in Insulating Materials, EURODIM'2002, Wrocław, Poland	Ion -implanted channel waveguides in Nd:YAG single crystals and epitaxial layers, OtuA6
[Pub108]	P.Moretti, M-F.Joubert, S.Tascu, B.Jacquier, M.Kaczkan, M.Malinowski, J.Sarnecki	Proc. of 21emes Journees Nationales d'Opique Guidee 2002, Dijon	Guides plans et canaux implantes dans des monocristaux et couches minces epitaxiees de YAG Nd
[Pub109]	A.Mossakowska-Wyszyńska, T.Kossek, P.Szczepański	Proc. of Conference IQEC/LAT 2002, Moscow, Russia	Nonlinear operation of circular grating DFB/DBR lasers with phase shift, No QsuR75
[Pub110]	A.Mossakowska-Wyszyńska, R.Paszkiewicz, P.Szczepański	SPIE Proc. of 19th Congress of International Commision for Optics, Florence, Italy	Dynamic operation of planar circular grating DFB/DBR laser with phase shift, SPIE vol. 4828 Part 2 pp. 687-688
[Pub111]	A.Mossakowska-Wyszyńska, A.Przybysz, P.Szczepański	Proc. of VII Sympozjum Techniki Laserowej, Szczecin-Świnoujście, Poland	Generacja promieniowania w falowodowych planarnych laserach F-P i DFB o strukturze kryształu fotonowego, vol. K, pp. 101-104
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[Pub113]	R. Pająk	Proc. IV Sympozjum Techniki Przetwarzania Obrazu - TPO2002	Wyznaczanie długości nowopowstałych w procesie angiogenezy naczyń metodą dwuwymiarowych filtrów dopasowanych, vol.4, pp. 312-317
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[Pub116]	R.Paszkiewicz, A.Tyszka-Zawadzka, T.Kossek, P.Szczepański	Proc. of Conference IQEC/LAT 2002, Moscow, Russia	Statistical properties of light generated by circular grating DBR laser with saturable absorber, No QsuR74
[Pub117]	R.Paszkiewicz, A.Tyszka-Zawadzka, P.Szczepański	SPIE Proc. of 19th Congress of International Commision for Optics, Florence, Italy	Dynamic operation of planar circular grating DFB/DBR laser with phase shift, vol. 4828 Part 2 pp. 687-688
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[Pub119]	W.A.Pleskacz, T.Borejko, W.Kuźmicz	Proceedings of the 17th IEEE International Symposium on Defect and Fault Tolerance in VLSI Systems – DFT 2002, Vancouver, Canada, November 6-8	CMOS Standard Cells Characterization for IDDQ Testing, pp. 390-398
[Pub120]	Z.Pióro	Proc. I Krajowa Konferencja Elektroniki, Poland	Wielka konwergencja – początek cyfrowego świata, pp. 55-63
[Pub121]	E.Piwowarska	E-Learning. Analiza Rozwiązań i Wdrożeń, Poznań, 4-5 December, Poland	Internetowe Studia Inżynierskie na Politechnice Warszawskiej – model, narzędzia, doświadczenia (CDROM)
[Pub122]	E.Piwowarska	Uniwersytet Wirtualny:model, narzędzia i praktyka 6-8 June, Warszawa, Poland	Światopoglądowe i Praktyczne Problemy w Nauczaniu Rozproszonym (CDROM)
[Pub123]	E. Piwowarska	Proc. II Warsztaty „Uniwersytet Wirtualny: model, narzędzia i praktyka	Światopoglądowe i praktyczne problemy w nauczaniu rozproszonym, p. 7
[Pub124]	E. Piwowarska	Proc. Konferencja E-learning – analiza rozwiazań i wdrożeń	Internetowe studia inżynierskie na Politechnice Warszawskiej – model, narzędzia, doświadczenie p 7
[Pub125]	E.Piwowarska, A.Pfitzner, Z.Jaworski, W.Kuźmicz	Proceedings of the 9th International Conference: "Mixed Design of Integrated Circuits and Systems" - MIXDES 2002, Wrocław, Poland, June 20-22	SPRint - Distance Teaching In Electrical And Computer Engineering In Warsaw University Of Technology, pp. 681-684
[Pub126]	E.Piwowarska, A.Pfitzner, Z.Jaworski, W.Kuźmicz	Proceedings of the EWME-4th European Workshop on Microelectronics Educations, May 23-24, Spain	Distance Training in Microelectronic Design: Problems and Tools, pp. 65-68
[Pub127]	C.Rapiejko, R.Mazurczyk, M.Gazicki, A.Werbowy	Proceedings of 45 Ann Tecg Conf. Society of Vacuum Coaters, ISSN 0737-399, Lake Buena Vista, Florida, USA, April 13 - 18	„Parallel plate RF plasma deposition of Si/C films using tetraalkylsilanes as precursor compounds”, pp. 372 - -377
[Pub128]	M.Sadowski	Proceedings of the 9th International Conference: "Mixed Design of Integrated Circuits and Systems" - MIXDES 2002, Wrocław, Poland, June 20-22	Ultra Low-Voltage Low-Power Dynamic Threshold CMOS Logic Circuit for Low Voltage Digital Integrated Circuits Design, pp. 359-362
[Pub129]	J.Sarnecki, R.Piramidowicz, M.Malinowski	Proc. of Internationale Conference on Solid State Crystals, Zakopane, Poland	Multi-ion interaction in highly Pr3+ doped epitaxial YAG waveguides, A20
[Pub130]	A.Schneider, K.H.Diener, E.Ivask, R.Ubar, E.Gramatova, M.Fisherova, W.Pleskacz, W.Kuźmicz	Proceedings of the 8th biennial Baltic Electronics Conference - BEC'2002, Tallinn, Estonia, October, 2002	Defect-Oriented Test Generation and Fault Simulation in the Environment of MOSCITO, pp. 303-306
[Pub131]	A.Schneider, K.H.Diener, E.Ivask, R.Ubar,	Proceedings of the EUROMICRO Symposium on Digital System	Integrated Design and Test Generation Under Internet Based Environment MOSCITO, ID: 059

	E.Gramatova, T.Hollstein, W.Kuźmicz, Z.Peng	Design: Architectures, Methods, and Tools - DSD'2002, Dortmund, Germany	
[Pub132]	M.Sutkowski, T.Grudniewski, J.Parka, A.Miniewicz	Proceedings of SPIE for XVI Conference on Liquid Crystals	The Holographic Movies Projected onto Nematic LC cells, vol. 4759, 2002, pp. 445-449
[Pub133]	S.Szostak, L.Łukasiak, A.Jakubowski	Proc. 4th IEEE International Caracas Conference on Devices, Circuits and Systems, Aruba, April 17 – 19	System for extensive characterization of MOS and SOI MOS structures by means of charge pumping, pp. 1033-1 – 1033-6
[Pub134]	S.Szostak, L.Łukasiak, A.Jakubowski	Proc. I Krajowa Konferencja Elektroniki, Poland	System do charakteryzacji struktur MOS i MOS SOI metodą pompowania ładunku, pp. 109 – 114
[Pub135]	P.Szczepański	Proc. of VII Sympozjum Techniki Laserowej, Szczecin-Świnoujście, Poland	Struktury periodyczne w fotonice, vol.R, pp. 31-33
[Pub136]	P.Szczepański	Proc. of 12th International Travelling Summer School on Microwaves & Lightwaves, Minsk, Belarus	Principles of lasers, CD-ROM, L.2, pp 18-26
[Pub137]	Z.Szczepański, J.Kalenik, P.Zajączkowski	Proceedings of 26th International Conference and Exhibition, IMAPS - Warsaw, Poland, August 25 - September 7	Anisotropic Conductive Adhesives in FCOB and COG Technology, pp.205-208
[Pub138]	D.Tomaszewski, L.Łukasiak, K.Domański, A.Jakubowski,	Proc. 4th IEEE International Caracas Conference on Devices, Circuits and Systems, Aruba, April 17 – 19	Small-signal model of partially-depleted SOI MOSFETS and its parameter extraction, pp. D023-1 – D023-4
[Pub139]	D.Tomaszewski, L.Łukasiak, K.Domański, A.Jakubowski, K.Kucharski, J.Gibki	Proceedings of the 9th International Conference: "Mixed Design of Integrated Circuits and Systems" - MIXDES 2002, Wrocław, Poland, June 20-22	Consistent DC and AC models of non-fully depleted SOI MOSFETs in strong inversion,pp. 111 – 114
[Pub140]	M.Wiśniewska, D.Wiśniewski, A.J.Wojtowicz, S.Tavernier, T.Łukasiewicz, Z.Frukacz, Z.Galazka, M.Malinowski	Proc. of Internationale Conference on Solid State Crystals, Zakopane, Poland	Luminescence and scintillation properties of YalO3:Pr, C17
[Pub141]	A.Wnuk M.Kaczkan, R.Piramidowicz, R.Mahiou, G.Chadeyron, M.-F.Joubert, M.Malinowski	Proc. of Europhysical Conference on Defects in Insulating Materials, EURODIM'2002, Wrocław, Poland	Dynamics of the up-conversion emission in holmium doped ZBLAN fiber, Oth A7
[Pub142]	A.Zaręba, A.Jakubowski	Proc. I Krajowa Konferencja Elektroniki, Poland	Modelowanie napięcia Early'ego w tranzystorach HBT z bazą SiGe, pp. 729 – 734

6.4. Scientific and Technical Books

Number	Authors	Publisher	Title, volume, pages
[Pub143]	L.Łukasiak	Oficyna Wydawnicza Politechniki Warszawskiej	Modele i elektryczne metody charakteryzacji przyrządów MOS i MOS SOI, Warszawa 2002, 122 p.
[Pub144]	T.Pałko, B.Galwas, G.Pawlicki	Akademicka Oficyna Wydawnicza EXIT	Biocybernetyka i Inżynieria Biomedyczna 2000, vol. 9, Fizyka Medyczna, Warszawa 2002, pp. 363-400
[Pub145]	A.Pfitzner, E.Piwowarska, W.A.Pleskacz	Politechnika Warszawska	Elektronika I, Seria: Akademickie Podręczniki Multimedialne, Warszawa 2002. - (CDROM)
[Pub146]	J.Woźnicki	Oficyna Wydawnicza Politechniki Warszawskiej	Szkoły wyższe w partnerstwie ze swoim otoczeniem, Warszawa 2002, 400 p.

6.5. Other Publications

Number	Authors	Publisher	Title, volume, pages
[Pub147]	B.Galwas	Magazyn Edukacji Wirtualnej nr 1/2002	Edukacja w Internecie – koniec początku

[Pub148]	B.Galwas	Magazyn Edukacji Wirtualnej nr 2/2002	Współczesne Uniwersytety Otwarte i Wirtualne, Materiały II Warsztatów: „Universytet Wirtualny: model, narzędzia i praktyka”
[Pub149]	B.Galwas	Magazyn Edukacji Wirtualnej nr 1/2002	Współczesne systemy Kształcenia Ustawicznego i Kształcenia Na Odległość
[Pub150]	B.Galwas, J.Barczyk, S.Nowak, E.Piwowarska, R.Rak	Magazyn Edukacji Wirtualnej nr 4/2002	Model SPRINT Zaocznych Inżynierskich Studiów na Odległość, Materiały II Warsztatów: „Universytet Wirtualny: model, narzędzia i praktyka”
[Pub151]	B.Galwas, J.Nowak, S.Nowak, M.Pajer, P.Witoński	Magazyn Edukacji Wirtualnej nr 1/2002	Edukacja w Internecie
[Pub152]	J.G.Hartnett,A.N.Luiten, J.Krupka, M.E.Tobar,P.Bilski	IEEE, WARS'2002	Microwave properties of ultra-low loss chromium - doped YAG
[Pub153]	Z.Hotra, M.Jakubowska, Z.Szczepański	Techniczni wisti	New Thick Film Materials for Piezoresistive Ceramic Pressure Sensor, No 1(14), 2(15), pp.48-51.
[Pub154]	J.Woźnicki	Forum Akaademickie	Ciężar kształcenia, no 9-10, pp. 34-35

7. REPORTS

7.1. Research Reports

[Rep1] Tadeusz M.Adamowicz, **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)

[Rep2] Tadeusz M.Adamowicz, **High beam quality UV lasers for microelectronics** (Opracowanie ultrafioletowych laserów generujących wysokiej jakości wiązki promieniowania dla zastosowań w mikroelektronice)

[Rep3] Mikołaj Baszun, **Microelectronic SAW sensors** (Mikroelektroniczne czujniki z akustyczną falą powierzchniową)

[Rep4] Romuald B. Beck, **Microsystems - construction, technology, design. Humidity sensor based on silicon** (Mikrosystemy – konstrukcje, technologie, projektowanie. Czujnik wilgotności w oparciu o strukturę krzemu porowatego)

[Rep5] Romuald B. Beck, **Porous silicon technology for applications in humidity sensors** (Technologia krzemu porowatego dla zastosowań w czujnikach wilgotności)

[Rep6] Romuald B. Beck, **RIE of GaN layers in flourine plasmas (technology and characterization)** (Trawienie warstw azotku galu w plazmie fluorowej (technologia i charakteryzacja))

[Rep7] Bogdan Galwas, **Analysis of working conditions and investigations of optically-switched microwave filters with the use of photovaractors** (Analiza warunków pracy i badania filtrów mikrofalowych przełączanych optycznie za pomocą fotowaraktora)

[Rep8] Hanna Górkiewicz-Galwas, **Colour image segmentation – methods, range of application and quality of image segmentation assessment** (Segmentacja barwnych obrazów cyfrowych – metody, zakres zastosowań, kryteria oceny jakości segmentacji)

[Rep9] Andrzej Jakubowski, **Thermally-induced metastability of amorphous silicon** (Termicznie indukowana metastabilność krzemu amorficznego)

[Rep10] Andrzej Jakubowski, **Ultrathin SiO2 and high-K dielectric layers for next generation ICs”** (Ultracienkie warstwy SiO2 oraz dielektryki o wysokiej przenikalności elektrycznej dla układów scalonych nowej generacji)

[Rep11] Zbigniew Jaworski, **Design methodology of analog ASICs based on the notion of virtual prototyping** (Metodologia projektowania analogowych układów ASIC oparta na koncepcji wirtualnego prototypowania)

[Rep12] Małgorzata Jurczak, **Silicon-germanium (SiGe) – material for new generation CMO devices** (Krzemogerman (SiGe) – materiał dla przyrządów CMOS następnej generacji)

[Rep13] Marcin Kaczkan, **Characterisation of the emission properties of Ho^{3+} doped $SrLaGa_3O_7$ and $SrLaGaO_4$ laser crystals** (Charakterystyka własności emisyjnych kryształów laserowych $SrLaGa_3O_7$ and $SrLaGaO_4$ aktywowanych jonami Ho^{3+})

[Rep14] Jerzy Kęsik, **Optimization of construction and technology of ion argon laser discharge tube** (Optymalizacja konstrukcji i technologii wykonania ceramiczno-metalowej rury wyładowczej jonowego lasera argonowego)

[Rep15] Marek Kostana, **Thermally induced metastability of amorphous silicon** (Termicznie indukowana metastabilność krzemu amorficznego)

[Rep16] Jerzy Kruszewski, **The elaboration of optical fibre micro-switch with optic piezoelectric actuator** (Opracowanie piezoelektrycznego mikroprzełącznika światłowodowego)

[Rep17] Jerzy Kruszewski, **The micro-opto-mechanical vibration sensor** (Mikrooptoelektromechaniczny czujnik wibracji)

[Rep18] Jerzy Krupka, **Numerical modelling of the chosen devicesfor measuring of electromagnetic properties of the electronic materials** (Modelowanie numeryczne wybranych urządzeń do pomiaru elektromagnetycznych właściwości materiałów elektronicznych)

[Rep19] Jerzy Krupka, **Tunable filters based on dielectric resonators TUF** (Przestrajalne filtry oparte na rezonatorach dielektrycznych)

[Rep20] Wiesław Kuźmicz, **Integrated Environment for VLSI Design** (Zintegrowane środowisko projektowania układów scalonych)

[Rep21] Wiesław Kuźmicz, **Methodology of designing standard CMOS cells in case of realisation of low-voltage and low-power integrated circuits** (Metodyka tworzenia komórek standardowych CMOS dla potrzeb realizacji układów scalonych o niskim poborze prądu i bardzo niskim napięciu zasilania)

[Rep22] Wiesław Kuźmicz, **REASON (Research and Training Action for System on Chip Design),** (Badania i szkolenia w zakresie projektowania systemów jednoukładowych) (IST–2000-30193)

[Rep23] Bogdan Majkusiak, **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)

[Rep24] Michał Malinowski, **Investigation and modeling of nonlinear solid state laser media** (Modelowanie i badanie nieliniowych ośrodków czynnych laserów ciała stałego)

[Rep25] Michał Malinowski, **Solid state micro-lasers for visible wavelengths** (Mikrolasery ciała stałego na zakres widzialny)

[Rep26] Michał Malinowski, **Visible rare-earth doped fiber laser** (Analiza pracy, badanie i opracowanie widzilnego, światłowodowego lasera włóknowego)

[Rep27] Andrzej Pfitzner, **Investigations and modelling of the influence of parasitic phemomena on the operation of the VLSI circuits, taking into account manufacturing conditions** (Badanie i modelowanie wpływu zjawisk pasożytniczych na pracę układów scalonych VLSI z uwzględnieniem uwarunkowań technologicznych)

[Rep28] Stanisław M. Pietruszko, **ENERBUILD—Network Energy in the Built Environment** (Sieć Energia w Budownictwie)

[Rep29] Stanisław M. Pietruszko, **Metastability in Amorphous Silicon** (Metastabilność w krzemie amorficznym)

[Rep30] Stanislaw M. Pietruszko,**PV Centre - Photovoltaic Centre of Competence in Poland** (Fotowoltaiczne Centrum Doskonałości w Polsce)

[Rep31] Stanisław M. Pietruszko, **PV-EC-NET - Network for Co-ordination of European and National RTD Programmes for Photovoltaic Solar Energy** (Zespół do Koordynacji Europejskiego i Krajowych (Krajów UE) Programów Rozwoju Fotowoltaicznej Energii Słonecznej SPUB-M)

[Rep32] Stanisław M. Pietruszko, **PVNET - Photovoltaic Network** (Sieć fotowoltaiki SPUB-M.)

[Rep33] Elżbieta Piwowarska, **Integrated signal discriminator for straw-based detectors used in high energy physics experiments** (Opracowanie scalonego układu odczytu danych z detektorów gazowych dla eksperymentów fizyki wysokiej energii)

[Rep34] Ryszard Piramidowicz, (Określenie warunków generacji promieniowania z zakresu ultrafioletu w światłowodach aktywnych domieszkowanych jonami Nd^{3+})

[Rep35] Witold Pleskacz, **Methods of the VLSI ICs Layout Analysis from the Manufacturabiliy Point of View** (Metody analizy topografii układów scalonych VLSI z punktu widzenia produkowalności tych układów)

[Rep36] Julitta Pogorzelska, I**nvestigations of degradation phenomena in termistors with negative thermal coefficient of resistance** (Badanie zjawisk starzeniowych termistorów z ujemnym temperaturowym współczynnikiem oporności)

[Rep37] Mariusz Sochacki, **Passivation layers for SiC Schottky diodes** (Wybrane warstwy pasywujące dla diod Schottky'ego na węgliku krzemu)

[Rep38] Jan Szmidt, **Novel dielectric layers for silicon carbide preserving their properties at elevated temperatures** (Nowe dielektryczne warstwy na węgliku krzemu zachowujące swoje właściwości w podwyższonych temperaturach)

[Rep39] Jan Szmidt, **The new generation (Zr, Ca, Sr, Ba) TiO_2 – based dielectric layers for microelectronics**

[Rep40] Jan Szmidt, **Technological processes for silicon carbide – a novel material for microelectronics, optoelectronics and microsystems** (Procesy technologiczne węglika krzemu półprzewodnikowego materiału nowej generacji dla mikroelektroniki, optoelektroniki i mikrosystemów)

[Rep41] Paweł Szczepański, **New active planar photonic band-gap structures** (Nowe aktywne struktury planarne z fotoniczne przerwą zabronioną)

[Rep42] Piotr Szwemin, **The development of Moly Flow..er Plus program library for obtaining the total correction factor of vacuum primary standards.** (Opracowanie modulu współczynnika korekcji totalnej systemów metrologicznych dla programu Moly Flow ..er Plus)

[Rep43] Artur Wnuk,**Photon avalanche studies in holmium doped laser materials** (Badanie zjawiska lawinowego w materiałach laserowych domieszkowanych Ho^{3+})

[Rep44] Jerzy Woźnicki, **Digital image analysis and processing of neovascularization** (Analiza procesów neowaskularyzacji metodami cyfrowego przetwarzania obrazów),

8. PATENTS

[Pat1] Jerzy Kęsik, Wojciech Kamiński, **The ion gas laser discharge tube**(Rura wyładowcza jonowego lasera gazowego) (patent: P356256; notified: 24 September 2002)

9. CONFERENCES, SEMINARS AND MEETINGS

9.1. International Conferences

[Con1] **4th IEEE International Caracas Conference on Devices, Circuits and Systems**, Aruba, April 17 – 19
speakers: L.Łukasiak, A.Jakubowski, P.Szczepański
program committee member: A.Jakubowski, L.Łukasiak

[Con2] **8th European Workshop on Amorphous Silicon**, Salerno, March 6-8
audience: S.M.Pietruszko

[Con3] **9th International Conference MIXDES Design of Integrated Circuits and Systems**, Wrocław, Poland, June 20-22
reporters: L.Łukasiak, A.Jakubowski, W.Kuźmicz, W.A.Pleskacz, E.Piwowarska, A.Pfitzner, Z.Jaworski, M.Sadowski
speakers: L.Łukasiak, A.Jakubowski, W.Kuźmicz, D.Kasprowicz, W.A.Pleskacz, A.Kobus, T.Janiszewski, E.Piwowarska, A.Pfitzner, Z.Jaworski, M.Sadowski, J.Laskowski, A.Jarosz, G.Janczyk
program committee members: W.Kuźmicz, A.Pfitzner
organizing committee member: W.Kuźmicz

[Con4] **9th International Energy Conference & Exhibition, ENERGEX 2002,** Cracow,Poland, May 19-24
speaker: S.M.Pietruszko
organizing committee member: S.M.Pietruszko

[Con5] **11th International Electrotechnical and Computer Science ERK'2002**, Lubljana, Slovenia, September 21-25
speaker: W.Kuźmicz

[Con6] **12th Int. Czecho-Slovak Scientific Conference RADIOELEKTRONIKA'2002,** Bratyslava, Slovakia, May 15
speaker: B.Galwas

[Con7] **12th Portuguese Conference on Pattern Recognition,** Porto, Portugal, June 27-28
reporter: G.Kukiełka

[Con8] **16th Europhysics Conference on Atomic and Molecular Physics of Ionized Gases,** Grenoble, France, July 15-21
speaker: T.M.Adamowicz

[Con9] **17th IEEE International Symposium on Defect and Fault Tolerance in VLSI Systems – DFT 2002,** Vancouver, Canada, November 6-8
speaker: W.Pleskacz
program committee member: W.Pleskacz

[Con10] **19th Congress of International Commision for Optics,** Florence, Italy, August 25-30
reporters: R.Paszkiewicz, P.Szczepański

[Con11] **19th International Liquid Crystals Conference**, Edinburgh, UK, June 30 – July 5
reporter: T.Grudniewski

[Con12] **2002 EDEN Annual Conference**, Granada, Spain, June16-19
reporter: B.Galwas

[Con13] **21emes Journees Nationales d'Opique Guidee, JNOG 2002**, Dijon, France, August 23-25
reporter: M.Malinowski

[Con14] **23rd Int. Conference of Microelectronics**, Nis, Jugoslavia, May 11-16
audience: J.Pogorzelska,

[Con15] **45th Annual Technical Conference**, Lake Buena Vista, Florida, USA, April 13 – 18
reporter: A.Werbowy

[Con16] **Baltic Electronics Conference REASON Tutorial: Design for Test of Systems on Chip: Analog Test**, Tallin, Estonia, October 7
speaker: W.Pleskacz

[Con17] **Biomedical Engineering,** Zakopane, Poland, April 15-19
speaker: M.Baszun

[Con18] **ChiPPS'2002 Challenges in Predictive Process Simulation,** Prague, Czech, October 13-17
reporter: A.Pfitzner

[Con19] **Colloque Franco-Polonais Material Science, Physics**, Lion, France, August 30 – October 2
reporter: M.Malinowski

[Con20] **Conf. Launching 6 Framework Programme,** Brussel, Belgium, November 11-13
audience: S.M.Pietruszko

[Con21] **Conf. PV in Europe,** Rome, Italy, October 6-11
speaker: S.M.Pietruszko

[Con22] **Conference IQEC/LAT 2002,** Moscow, Russia, June 22-28
reporter: T.Kossek

[Con23] **Cross-Fertilisation Workshop for PV; Workshop on European RTD Strategies for PV,** May 28 – June 6
speaker: S.M.Pietruszko

[Con24] **Distancjonnoje obyczenie – obrazowatelnaja sreda XXI wieka**, Minsk 2002
reporter: E.Piwowarska

[Con25] **EGAS 3, 34th Int. Conference of European Group for Atomic Spectroscopy,** Sofia, Bulgaria, July 8-14
speaker: T.M.Adamowicz

[Con26] **European Conference, The New Educational Benefits of ICT**, Rotterdam, 2-4 September
reporter: B.Galwas

[Con27] **European Microelectronics Packing Symposium**, Cracow, Poland June 16-18
speaker: R.Kisiel
audience: Z.Szczepański, J.Kalenik

[Con28] **European Research 2002,** Brussel, Belgium, November 11-13
audience: A.Trębicki

[Con29] **Europhysical Conference on Defects in Insulating Materials, EURODIM'2002**, Wrocław, Poland, June 30 – July 6
reporters: M.Malinowski, R.Piramidowicz

[Con30] **EWME-4th European Workshop on Microelectronics Educations**, Vigo, Spain, May 23-24
speaker: W.Kuźmicz
reporter: E.Piwowarska
program committee member: W.Kuźmicz

[Con31] **Forum Nauki Polskiej**, London, UK, May 18-21
speaker: M.Malinowski

[Con32] **Information Society Technologies for BroadBand Europe**, Bucuresti, Romania, October 9-11
co-organizer: W.Kuźmicz

[Con33] **International Workshop On Teaching In Photovoltaics,** Prague, Czech, September 26-27
reporter: S.M.Pietruszko

[Con34] **Internationale Conference on Solid State Crystals,** Zakopane, Poland, October 14-18
reporters: M.Malinowski, R.Piramidowicz

[Con35] **IST'2002 Information Society Technologies,** Kopenhaga, Denmark, November 2-6
audience: W.Kuźmicz

[Con36] **IV International Symposium „Ion implantation and other application of ions and electrons" ION 2002**, Kazimierz Dolny, Poland, June 10-13
reporters: A.Szczęsny, P.Śniecikowski, R.B. Beck, M.Giedz, K.Klimczak, A.Werbowy

[Con37] **Joint IMEKO TC-1 & XXXIV MKM Conference 2002**, Wrocław, Poland, September 8-12
reporter: R.Rak

[Con38] **MIKON'2002 – XIV International Conference on Microwaves, Radar and Wireless Communications**, Gdańsk, Poland, May 20-22
speaker: B.Galwas
reporters: Z.Szczepaniak, J.Krupka

[Con39] **MMA'2002,** York, UK, August 31- September 19
audience: J.Krupka

[Con40] **Modern Problems of Radio Engineering, Telecommunications and Computer Science**, Lwów, Ukraine, February 18-23
speakers: A.Pfitzner, W.Pleskacz

[Con41] **Polsko-Niemiecka Konferecja nt. Szkolnictwa Wyższego**, Bonn, Germany, November 30 – December 3
adiuence: J.Woźnicki

[Con42] **POLYTRONIC'2002,** Hungary, June 23-26
speaker: R.Kisiel

[Con43] **The XIV International Symposium On Gas Flow & Chemical Lasers and High Power Laser Conference**, Wrocław, Poland, August 25-30
reporter: P.Witoński

[Con44] **UNESCO Conference on "Statistical Indicators for Quality Assessment of Higher/Tertiary Education Institutions,"** Warsaw, Poland, June 13-14
speaker: J. Woźnicki

[Con45] **URSI'2002, XXVII General Assembly of the International Union of Radio Science Contribution,** Maastricht, Holland, August 16-25
speaker: J.Krupka

[Con46] **WARS'2002,** Sydney, Australia February
reporter: J.Krupka

[Con47] **Workshop "Renewable Energies in Candidate Countries:Supporting the EU Enlargement Process",** JRC, Ispra, October 26-28
speaker: S.M.Pietruszko
organizing committee chairman: S.M.Pietruszko

[Con48] **World Renewable Energy Conference,** Cologne, Germany, June 29 – July 5
speaker: S.M.Pietruszko
organizing committee member: S.M.Pietruszko

[Con49] **X Symposium IEEE Poland Section/Student Branch, Joint Workshop,** Wilga, Poland, May 26
speaker: R.Kisiel

[Con50] **XVI Conference on Liquid Crystals: Chemistry, Phisics and Applications**, Zakopane, Poland, September 3-7
reporter: T.Grudniewski

[Con51] **XVI Italian Vacuum Society Congress,** Catania, Italy, October 7-9
speaker: P.Szwemin

[Con52] **XXVI International Conference of International Microelectronics and Packaging Society, Poland Chapter IMAPS**, Warsaw, Poland, August 25 – September 7
speaker: A.Jakubowski
reporters: L. Łukasiak, A.Jakubowski, A.Zaręba
organizing committee member: Z.Szczepański
organizing committee chairman: R.Kisiel

[Con53] **Conference Photovoltaic Science and Engineering,** Osaka, Japan May 10-15
program committee member: S.M.Pietruszko

9.2. Local Conferences

[Con54] **COE'2002,** Rzeszów, June 4-8
reporters: M.Borecki, J.Kruszewski, M.Bebłowska

[Con55] **Conference on Image Processing Techniques TPO 2002, (**Techniki Przetwarzania Obrazu), Serock, November 21-23
program committee chairman: J.Woźnicki
organizing committee members: H.Górkiewicz-Galwas, J.Domański, G.Kukiełka, T.Grudniewski, R.Pająk
chairman: H.Górkiewicz-Galwas
speaker: G.Kukiełka
reporters: R.Pająk, T.Grudniewski

[Con56] **Drugie Warsztaty PW „Uniwersytet Wirtualny: model, narzędzia i praktyka",** Warsaw, June 6-8
speaker: E.Piwowarska, B.Galwas
organizing committee member: E.Piwowarska

[Con57] **E-Learning. Analiza Rozwiązań i Wdrożeń**, Poznań, December 4-5
speaker: E.Piwowarska

[Con58] **ICSES'2002,** Świeradów Zdrój, September 24-27
program committee member: W.Kuźmicz

[Con59] **Konferencja - Koszty Jakości w Zarządzaniu Jakością,** Kraków, September 12-13
audience: J.Pogorzelska

[Con60] **Konferencja Instytutu Spraw Publicznych „Zmiany w oświacie a integracja z Unią Europejską,"** Warsaw, September 5
speaker: J.Woźnicki

[Con61] **Konferencja Modelowanie i Symulacja,** Kościelisko, June 24-28
speaker: M.Baszun

[Con62] **Krajowa Konferencja Elektroniki,** Kołobrzeg – Dźwirzyno, June
speakers: A.Jakubowski, L.Łukasiak, Z.Pióro, T.Guzdek, S.Szostak, P.Brzozowski, M.Kostana, A.Zaręba, M.Sochacki, J.Szmidt, A.Linkowski
reporter: M.Kostana
program committee: A.Jakubowski, J.Szmidt

[Con63] **Krajowa Konferencja Radiokomunikacji, Radiofonii i Telewizji KKRRiT 02,** Gdańsk, June 12-14
reporters: G.Kukiełka, W.Skarbek

[Con64] **VI Krajowa Konferencja Techniki Próżni,** Korbielów, September 23-25
reporters: P.Szwemin, K.Szymański, M.Niewiński
speaker: P.Szwemin
organizing committee chairman: P.Szwemin
organizing committee member: P.Szwemin

[Con65] **VII Sympozjum „Chemia Plazmy,"** Kazimierz Dolny, September 16-18
reporters: M.Leśko, J.Szmidt, R.B.Beck, T.Bieniek, M.Cuch, M.Gałązka, A.Werbowy
speakers: J.Szmidt, A.Werbowy

[Con66] **VII Sympozjum Techniki Laserowej**, Szczecin-Świnoujście, September 23-27
reporters: P.Witoński, M.Malinowski, R.Piramidowicz, P.Szczepański, A.Mossakowska-Wyszyńska, R.Paszkiewicz, T.Kossek, P.Czuma, W.Kamiński, J.Kęsik, T.M.Adamowicz K.Dzięciołowski, W.Kwaśniewski, M.Nakielska, M.Kowalska, M.Kaczkan, A.Wnuk
speakers: M.Malinowski, P.Szczepański, T.M.Adamowicz,
audience: W.Woliński
organizing committee members: P.Szczepański, M.Malinowski, S.Jonak
program committee chairman: W.Woliński

[Con67] **VIII Konferencja Światłowody i ich Zastosowanie,** Białowieża, January 23-26
speaker: A.Szymańska
reporters: M.Borecki, J.Kruszewski, P.Wrzosek

9.3. Schools and Seminars

[Con68] **12th International Travelling Summer School on Microwaves & Lightwaves**, Bielarus, July 12-18
speakers: B.Galwas, Z.Szczepaniak, P.Szczepański

[Con69] **Institute seminar "Postępy Mikroelektroniki i Fotoniki":** ITRS Roadmap, April 29
speaker: P.S.Gwóźdź (San Jose State University, CA, USA)
audience: K.Szylko, J.Kalenik, J.Borecki, M.Malinowski, R.Beck, R.Biaduń, P.Warda, E.Piwowarska, S.Pietruszko, W.Pleskacz, J.Szmidt, J.Kruszewski, R.Kisiel, Z.Szczepański, A.Pfitzner, P.Szwemin

[Con70] **Institute seminar "Postępy Mikroelektroniki i Fotoniki":** Lasery ciała stałego – nowe materiały i układy pracy, June 13
speaker: M.Malinowski
audience: M.Borecki, Z.Szczepaniak, P.Witoński, P.Szczepański, P.Warda, P.Wrzosek, J.Kalenik, E.Piwowarska, M.Kowalska, M.Nakielska, M.Kaczkan, A.Wnuk, T.Adamowicz, J.Pogorzelska, W.Woliński, J.Sarnecki, S.Pietruszko, A.Pfitzner, R.Paszkiewicz, J.Szmidt,M.Grodzki, A.Mikołajczyk, M.Hodzyński, M.Torbicz, K.Baran, J.Piotrowski, J.Kruszewski, D.Pawlak, B.Kaczmarek, J.Kisielewski, S.Jonak, R.Piramidowicz, A.Kłos, W.Pleskacz, P.Szwemin

[Con71] **Institute seminar "Postępy Mikroelektroniki i Fotoniki":** Morphological and compositional evolution in compound semiconductor thin films, May 9
speaker: J.Mirecki Millunchick (University of Michigan, USA)
audience: E.Piwowarska, R.Beck, M.Malinowski, A.Jakubowski, J.Szmidt, J.Kruszewski, M.Borecki, H.Górkiewicz-Galwas, W.Pleskacz, W.Kuźmicz, A.Pfitzner, P.Szwemin

[Con72] **Institute seminar "Postępy Mikroelektroniki i Fotoniki":** Pomiary elektromagnetycznych właściwości materiałów w paśmie mikrofalowym, May 16
speaker: J.Krupka
audience: A.Mossakowska-Wyszyńska, P.Szczepański, M.Malinowski, Z.Jaworski, E.Piwowarska, G.Filipkiewicz, Mohamed Eldliu, K.Płochocki, J.Kalenik, W.Pleskacz, A.Pfitzner, J.Piotrowski, D.Kasprowicz, R.Paszkiewicz, W.Wiatr, J.Domański, G.Kukiełka, H.Górkiewicz-Galwas

[Con73] **Institute seminar:** Badanie właściwości fotorefrkacyjnych przetworników ciekłokrystalicznych oraz ich zastosowania w holografii dynamicznej, December 12
speaker: T.Grudniewski
audience: A.Pfitzner, P.Szwemin, E.Piwowarska, H.Górkiewicz-Galwas, J.Woźnicki, J.Parka, J. Zmita, P.Wrzosek, J.Domański

[Con74] **Institute seminar:** Metodyka konstrukcji bardzo szybkich małej mocy niskonapięciowych bramek cyfrowych, November 21
speaker: M.Sadowski
audience: W.Kuźmicz, A.Pfitzner, P.Szwemin, E.Piwowarska

[Con75] **Institute seminar:** Osiągnięcia badawcze w dziedzinie czujników światłowodowych, November 28
speakers: M.Bebłowska, M.Borecki
audience: W.Kuźmicz, A.Pfitzner, P.Szwemin, E.Piwowarska, J.Kruszewski, P.Wrzosek, M.Niewiński, M.Malinowski, R.Piramidowicz, M.Pawlak, M.Cieślik, K.Lachowska, A.Kot, R.Stepień, I.Kujawa, P.Warda, D.Stadnik, A.Jasik, R.Kisiel, R.Biaduń, J.Kalenik, Z.Szczepański, W.Pleskacz, E.Augusciuk, J.Pogorzelska, H.Górkiewicz-Galwas, E.Brzozowski, L.Kociszewski

[Con76] **Institute seminar:** Osiągnięcia w dziedzinie fotowoltaiki, December 12
speaker: S.Pietruszko
audience: K.Lachowska, K.Szylko, A.Pfitzner, M.Cieślik, M.Pawlak, T.Kozłowski, G.Koślacz, J.Siwik, P.Warda, M.Grodzki, A.Mikołajczyk, P.Zaremba, E.Piwowarska, M.Malinowski, R.Piramidowicz, M.Borecki, J.Kruszewski, P.Szwemin, J.Woźnicki, J.Domański, H.Górkiewicz-Galwas, W.Pleskacz, W.Kuźmicz

[Con77] **Institute seminar:** Warunki wzbudzania promieniowania krótkofalowego w laserowych kryształach $SrLaGa_3O_7$ i $SrLaGaO_4$ aktywowanych jonami holmu, May 9
speaker: M.Kaczkan
audience: M.Malinowski, P.Warda, A.Mossakowska-Wyszyńska, P.Szwemin, P.Szczepański, M.Kowalska, M.Nakielska, R.Piramidowicz, A.Wnuk, R.Paszkiewicz

[Con78] **Posiedzenie Sekcji Mikroelektroniki KEiT PAN,** Warsaw, April
speaker: J.Szmidt

[Con79] **Seminar in Instituto di Metrologia G.Collonetti,** Turyn, Italy, October 4
speaker: P.Szwemin

[Con80] **Seminar in XXVII General Assembly of the International Union of Radio Science,** Maastricht, August17-24
speaker: J.Krupka

[Con81] **Zgromadzenie Plenarne Polskiej Akademii Nauk,** Warsaw, May 24
speaker: J.Woźnicki

10. PRIZES

[Prize1] Sławomir Szostak**, Rector's Award for Scientific Achievements 2002**