PROCEEDINGS OF SPIE

SPIE – The International Society for Optical Engineering

Photonics Applications VI

In Astronomy, Communications, Industry and High-Energy Physics Experiments

Ryszard S. Romaniuk
Conference Chair/Editor

29 May – 04 June 2006
Wilga, Poland

Organized by
PERG & ELHEP Laboratories, Institute of Electronic Systems
Warsaw University of Technology (Poland)
Student Branch, IEEE Poland Section
Student Branch, SPIE Poland Chapter

Sponsored by
IEEE Poland Section & SPIE Poland Chapter
Faculty of Electronics and Information Technologies, Warsaw University of Technology
Institute of Electronic Systems, Warsaw University of Technology (Poland)
Committee of Electronics and Telecommunications, Polish Academy of Sciences
Polish Committee of Optoelectronics, Association of Polish Electrical Engineers
Inter-Association Committee of Electronics, Telecommunication and Information Technologies
Association of Polish Mechanical Engineers

In Cooperation with
CERN, Geneva, Switzerland
DESY, Hamburg, Germany
TTC, TESLA Technology Collaboration
CARE, Coordinated Accelerator Research in Europe
ELAN, European Linear Accelerator Network
CEA, DAPNIA, Saclay, France

SPIE Proceedings Series
Volume 6347

Contents

Control system modeling for superconductive accelerator [6347-09]
T.Czarski, K.T.Poźniak, R.S.Romaniuk, Warsaw Univ. of Technology (Poland), S.Simrock, DESY, Hamburg (Germany)

DOOCS patterns, reusable software components for FPGA based RF Gun field controller [6347-10]
P.Pucyk, Warsaw Univ. of Technology (Poland)

Embedded system in FPGA based LLRF controller for FLASH [6347-11]
J.Szewinski, P.Pucyk, W.Jalmuzna, P.Fafara, M.Pieciukiewicz, K.T.Pozniak, R.S.Romaniuk, Warsaw Uni. of Technology (Poland)

SESSION 2 LLRF CONTROL SYSTEM FOR TESLA TECHNOLOGY VUV-FEL, European X-FEL and ILC - PART II: SOFTWARE

Single bunch induced transient detection [6347-12]
P.Pawlik, M.Grecki, DMSC, Lodz Uni. of Technology (Poland), S.Simrock, DESY, Hamburg (Germany)

Fault tolerant VHDL descriptions: A case study for SEU-tolerant digital library [6347-13]
M.Tomczak, B.Swiercz, A.Napieralski, Łódź Univ. of Technology (Poland)

Application of RadFET for dosimetry of ionizing radiation [6347-14]
D.Makowski, M.Grecki, Technical Univ. of Łódź (Poland), B.Mukherjee, DESY, Hamburg (Germany), A.Napieralski, Technical Univ. of Łódź (Poland)

Beam intensity measurement system for Proton Synchrotron Booster [6347-15]
D.Belohrad, CERN, Geneva (Switzerland), G.Kasprowicz, Warsaw Univ. of Technology (Poland)

Clock-efficient and maintainable implementation of complex state machines in VHDL [6347-16]
W.M.Zabolotny, Warsaw Univ. of Technology (Poland)

Testing of application specific integratedcircuit in LabView environment [6347-17]
P.Maj, AGH Univ. of Science and Technology, Cracow (Poland)

Behavior of Altera FPGA circuits working under non-standard conditions [6347-18]
M.Grajda, Warsaw Univ. of Technology (Poland)

Modelling and synthesis of automata in HDLs [6347-19]
S.Chmielewski, M.Wegrzyn, Univ. of Zielona Góra (Poland)

SESSION 3 EXPERIMENTS IN SPACE RESEARCH, ASTRONOMY AND ASTROPARTICLE PHYSICS

Status of the full scale "Pi of the Sky" project (Invited Paper) [6347-20]
M.Cwiok, Warsaw Univ. (Poland), J.Grugorczuk, Space research Centre, Warsaw (Poland), L.Mankiewicz, Center of Theoretical Physics PAS, Warsaw (Poland), J.Mrowca-Ciulacz, K.Nawrocki, M.Sokolowski, G.Wrochna, Soltan Institute for Nuclear Studies, Warsaw (Poland),

Study of rapidly varying astrophysical objects with the "Pi of the Sky" – apparatus (Invited Paper) [6347-21]
M.Biskup, M.Cwiok, H.Czyrkowski, R.Dabrowski, W.Dominik, Warsaw Univ. (Poland), G.Kasprowicz, Warsaw Univ. of Technology (Poland), K.Malek, Cardinal Wyszynski Univ, Warsaw (Poland), L.Mankiewicz, Center for Theoretical Physics, Polish Academy of Sciences, Warsaw (Poland), M.Molak, Warsaw Univ. of Technology (Poland), J.Mrowca-Ciulacz, K.Nawrocki, Soltan Institute for Nuclear Studies, Warsaw (Poland), L.W.Piotrowski, Warsaw Univ. (Poland), P.Sitek, M.Sokolowski, Soltan Institute for Nuclear Studies, Warsaw (Poland), J.Uzycki, Warsaw Univ. of Technology (Poland), G.Wrochna, Soltan Institute for Nuclear Studies, Warsaw (Poland), A.F.Zarnecki, Warsaw Univ. Poland)

Search for cosmic rays from gamma ray bursts by "MazePi" project [6347-22]
M.Molak, Warsaw Univ. of Technology (Poland), J.Szabelski, Soltan Institute for Nuclear Studies, Warsaw (Poland), W.Tlaczala, Warsaw Univ. of Technology (Poland), T.Wibig, G.Wrochna, Soltan Institute for Nuclear Studies, Warsaw (Poland)

New low noise CCD cameras for "Pi of the Sky"project [6347-23]
G.Kasprowicz, Warsaw Univ. of Technology (Poland), H.Czyrkowski, R.Dabrowski, W.Dominik, Warsaw Univ. (Poland), L.Mankiewicz, Center for Theoretical Physics, Polish Academy of Sciences, Warsaw (Poland), K.T.Pozniak, P.Sitek, Warsaw Univ. of Technology (Poland), M.Sokolowski, Warsaw Univ. (Poland), R.Sulej, Warsaw Univ. of Technology (Poland), J.Uzycki, Warsaw Univ. (Poland), G.Wrochna, Soltan Institute for Nuclear Studies, Warsaw (Poland)

Image acquisition in the "Pi of the Sky" project [6347-24]
M.Jegier, Warsaw Univ. of Technology (Poland), K.Nawrocki, Soltan Institute for Nuclear Studies, Warsaw (Poland), K.Pozniak, Warsaw Univ. of Technology (Poland), M.Sokolowski, Soltan Institute for Nuclear Studies, Warsaw (Poland)

Limits on GRB early optical emission from "Pi of the Sky" system [6347-25]
L.W.Piotrowski, Warsaw Univ. (Poland), L.Mankiewicz, Center for Theoretical Physics, Polish Academy of Sciences (Poland), M.Sokolowski, Soltan Institute for Nuclear Studies, Warsaw (Poland), G.Wrochna, Soltan Institute for Nuclear Studies, Warsaw (Poland), A.F.Zarnecki, Warsaw Univ. Poland)

All sky scan algorithm for "Pi of the Sky"project [6347-26]
K.Malek, Cardinal Wyszynski Univ, Warsaw (Poland), L.Mankiewicz, Center for Theoretical Physics, Polish Academy of Sciences (Poland), L.W.Piotrowski, Warsaw Univ. (Poland), M.Sokolowski, Soltan Institute for Nuclear Studies, Warsaw (Poland)

Data transmission protocol for "Pi of the Sky" cameras [6347-27]
J.Uzycki, G.Kasprowicz, Warsaw Univ. of Technology (Poland), L.Mankiewicz, Center for Theoretical Physics, Polish Academy of Sciences, Warsaw (Poland), K.Nawrocki, M.Sokolowski, Soltan Institute for Nuclear Studies, Warsaw (Poland), P.Sitek, R.Sulej, W.Tlaczala, Warsaw Univ. of Technology (Poland)

Tools for "Pi of the Sky" data exploration [6347-28]
M.Sawitus, J.Tyszkiewicz, Warsaw Univ., (Poland), L.Mankiewicz, Center for Theoretical Physics, Polish Academy of Sciences, Warsaw (Poland), , G.Wrochna, Soltan Institute for Nuclear Studies, Warsaw (Poland)

Databases for the "Pi of the Sky" experiment [6347-29]
M.Biskup, Warsaw Univ. (Poland), L.Mankiewicz, Center for Theoretical Physics, Polish Academy of Sciences, Warsaw (Poland), M.Sokolowski, G.Wrochna, Soltan Institute for Nuclear Studies, Warsaw (Poland)

SESSION 4 BRAGG GRATINGS AND NONLINEAR OPTICAL FIBERS

Technology and spectral properties of Bragg gratings written in the fiber taper region (Invited Paper) [6347-30]
K.Jedrzejewski, T.Tenderenda, Warsaw Univ. Technology (Poland)

Long Period Grating – technology and parameters [6347-31]
K.Czachor, K.P.Jedrzejewski, Warsaw Univ. Technology (Poland)

Strain and temperature sensor applications of fiber Bragg gratings [6347-32]
P.Chojnowski, K.P.Jedrzejewski, Warsaw Univ. Technology (Poland)

Behavior of a uniform fiber Bragg grating under impulsive strain [6347-33]
A.Sikora, Kielce Univ. of Technology (Poland)

Nonlinear propagation of various shape ultrashort pulses in a linearly birefringent single mode optical fiber. Numerical analysis [6347-34]
C.Kaczmarek, Warsaw Univ. of Technology (Poland)

SESSION 5 CAPILLARY AND RING-CORE OPTICAL FIBERS

Applications of capillary optical fibers (Invited paper) [6347-35]
R.S.Romaniuk, Warsaw Univ. of Technology (Poland)

Technology of soft-glass optical fiber capillaries [6347-36]
R.S.Romaniuk, Warsaw Univ. of Technology (Poland). J.Dorosz, Bialystok Univ. of Technology (Poland)

Mechanical properties of hollow optical fibers [6347-37]
R.S.Romaniuk, Warsaw Univ. of Technology (Poland), J.Dorosz, Bialystok Univ. of Technology (Poland)

Optical fiber capillaries in trunk telecommunications [6347-38]
R.S.Romaniuk, Warsaw Univ. of Technology (Poland)

Atom guiding in single mode optical fiber capillary [6347-39]
R.S.Romaniuk, Warsaw Univ. of Technology (Poland), J.Dorosz, Bialystok Univ. of Technology (Poland)

High power optical fiber capillaries [6347-40]
R.S.Romaniuk, Warsaw Univ. of Technology (Poland)

Light transmission characteristics of silica capillaries [6347-41]
M.Borecki, Warsaw Univ. of Technology (Poland), M.Korwin-Pawlowski, Centre de recherché en photonique, Univ. du Quebec en Outaouais (Canada), M.Beblowska, Warsaw Univ. of Technology (Poland)

Measurement of refractive index using capillary waveguide [6347-42]
P.Miluski, D.Dorosz, Bialystok Univ. of Technology (Poland)

Ring-core optical fiber doped with neodymium [6347x-43]
D.Dorosz, Bialystok Univ. of Technology (Poland)

SESSION 6 MATERIALS FOR OPTICAL FIBER TECHNOLOGY

Operating conditions of dysprosium activated fluorozirconate fiber laser in the visible [6347-44]
M.Klimczak, P.Witonski, W.Zurawski, R.Piramidowicz, Warsaw Univ. of Technology (Poland)

Pr – doped lead fluorocarbonate glasses [6347-45]
J.Pisarska, Silesian Univ. of Technology, Katowice (Poland), G.Dominiak-Dzik, W.Ryba-Romanowski, Institute of Low Temperature and Structure Research, Wroclaw (Poland), W.A.Pisarski, Univ. of Silesis, Katowice (Poland)

Luminescence of thulium and praseodymium in the fluoroindate glass ceramics [6347-46]
E.Augustyn, J.Pisarska, Silesian Univ. of Technology, Katowice (Poland)

Selected glasses and glass-ceramics for NIR luminescence [6347-47]
J.Pisarska, Silesian Univ. of Technology, Katowice (Poland), W.A.Pisarski, Univ. of Silesia, Katowice (Poland)

Synthesis and spectral analysis of hyperbranched poly(ethers) containing carbazole or hydrazone groups [6347-48]
W.A.Pisarski, A.Swinarew, B.Morejko, Z.Grobelny, A.Stolarzewicz, Univ. of Silesia, Katowice (Poland), J.V.Grazulevicius, V.Getautis, Kaunas Univ. of Technology (Lithuania)

Physico-chemical properties of organically modified silicates' sol-gel layers for optical fiber sensors [6347-49]
E.Chodkowska, J.Rayss, Maria Curie-Sklodowska Univ., Lublin (Poland)

Preparation and characterization of Ni_N nanocrystals embedded in a carbonaceous matrix [6347-50]
E.Czerwosz, Swietokrzyska Academy, Kielce (Poland), P.Dluzewski, Institute of Physics, Polish Academy of Sciences, Warsaw (Poland), J.Keczkowska, Kielce Univ. of Technology (Poland), M.Kozlowski, Industrial Institute of Electronics, Warsaw (Poland), J.Rymarczyk, Swietokrzyska Academy, Kielce (Poland), M.Suchanska, Kielce Univ. of Technology (Poland)

SESSION 7 PHOTOACOUSTICS

A new approach to photoacoustic measurements [6347-51]
T.Borowski,

Programmable filter for photoacoustic experiments [6347-52]
T.Starecki, M.Grajda, Warsaw Univ. of Technology (Poland)

Programmable virtually-zero-noise polarization voltage supply for condenser microphones [6347-53]
T.Starecki, Warsaw Univ. of Technology (Poland)

SESSION 8 OPTOELECTRONIC EQUIPMENT

"Aurometer" the fog and rain detector for visibility measurements [6347-54]
K.Holejko, R.Nowak, T.Czarnecki, Warsaw Univ. of Technology (Poland)

Polarization state analysis in optical coherence tomography [6347-55]
M.Strakowski, J.Plucinski, M.Maciejewski, B.B.Kosmowski, Gdansk Univ. of Technology (Poland)

Dispersion compensation in optical coherence tomography [6347-56]
M.Maciejewski, M.Strakowski, j.Plucinski,B.B.Kosmowski, J.Borecki, Gdansk Univ. of Technology (Poland)

Influence of numerical quantization on imaging quality in digital holography [6347-57]
M.J.Matczak, L.Pyziak, D.Borowicz, Univ. of Rzeszow (Poland)

Automatic analysis of interferograms – the issue of phase shifter calibration [6347-58]
B.Zielinski, K.Patorski, Warsaw Univ. of Technology (Poland)

Influence of multimode fiber frequency response variations on subcarrier multiplexing [6347-59]
L.Maksymiuk, G.Stepniak, Warsaw Univ. of Technology (Poland)

Modelling of the dispersion coefficient for optical beamforming for phased array antennas [6347-60]
K.M.Madziar, J.Dawidczyk, Warsaw Univ. of Technology (Poland)

SESSION 9 OPTICAL FIBER SENSORS AND LIGHTING TECHNOLOGY

The proposition of reflectometric fiber optic load sensor [6347-61]
M.Borecki, M.Beblowska, P.Wrzosek, Warsaw Univ. of Technology (Poland)

Optical fiber switch for sensor networks – designprinciples [6347-62]
M.Borecki, J.Szmidt, P.Wrzosek, M.Beblowska, Warsaw Univ. of Technology (Poland)

Modelling of a nonlinear PIN photodiode responsivity for frequency mixing of optically transmitted microwave signals [6347-63]
J.Dawidczyk, Warsaw Univ. of Technology (Poland)

Flat light guiding plate with prismatic elements and polarization film at entry surface [6347-64]
K.Zaremba, Białystok Univ. of Technology (Poland)

The analysis of light flux distribution from shaping optical fiber [6347-65]
M.Zajkowski, Białystok Univ. of Technology (Poland)

SESSION 10 OPTICAL INTERCONNECTIONS, PACKAGING, SOLDERING, AND RFID TECHNOLOGY

Polymers for electrical connections in printed circuit boards (Invited Paper) [6347-66]
R.Kisiel, Warsaw Univ. of Technology (Poland)

Investigation of electromigration on printed circuit boards soldered with lead-free solder [6347-67]
K.Kielbasinski, J.Kalenik, R.Kisiel, Warsaw Univ. of Technology (Poland)

Investigation of electroless tin deposition from acidic thiourea-type bath [6347-68]
A.Arazna, J.Bielinski, Tele and Radio Research Institute, Warsaw (Poland)

Applying of thin layer resistors in multilayer printed circuit boards [6347-69]
J.Borecki, Tele and Radio Research Institute, Warsaw (Poland)

The new helping hand in the technological process of the negative form production [6347-70]
L.Zaniewski, A.Bialostocka, Bialystok Univ. of Technology (Poland)

The analysis of electrical field intensity in contacts of making switch [6347-71]
S.Kulas, L.Kolimas, Warsaw Univ. of Technology (Poland)

An overview of radio frequency identification (RFID) tags technology [6347-72]
C.Kaczmarek, Warsaw Univ. of technology (Poland)

Jamming protection of spread spectrum RFID system [6347-73]
J.Dawidczyk, Warsaw Univ. of Technology (Poland)

SESSION 11 BIOMETRICS

Emerging biometrics: EEG-based identity verification [6347-74]
R.Wardzinski, NASK Research and Academic Computer Network, Warsaw (Poland)

Iris recognition with compact zero-crossing-based coding [6347-75]
A.Czajka, P.Strzelczyk, Warsaw Univ. of Technology (Poland)

On-line signature verification using Dynamic Time Warping with positional coordinates [6347-76]
J.Putz-Leszczynska, Warsaw Univ. of Technology (Poland)

Support Vector Machine for hand geometry-based identity verification system [6347-77]
L.Stasiak, Warsaw Univ. of Technology (Poland)

SESSION 12 BIOMEDICAL APPLICATIONS OF PHOTONIC AND ELECTRONIC SYSTEMS

Assessment of fetal heart disorders by means of fetal magnetocardiography [6347-78]
M.Lozinska, Z.Dunajski, Warsaw Univ. of Technology (Poland)

Portable device, based on microcontroller, for measurement of TEWL factor [6347-79]
M.Bak, G.Tarapata, J.Weremczuk, Warsaw Univ. of Technology (Poland)

Microcontroller based, portable device for seeds moisture measurements [6347-80]
R.Iwaszko, G.Tarapata, J.Weremczuk, Warsaw Univ. of Technology (Poland)

Data analysis in a computer operated diagnostic system for laryngological and dermatological disorders [6347-81]
M.Kuls, D.Paczesny, G.Tarapata, Warsaw Univ. of Technology (Poland)

Wireless smart sensor interface [6347-82]
K. Plotczyk, J.Weremczuk, Warsaw Univ. of Technology (Poland)

Computer assisted uroflowmetry diagnostic system [6347-83]
J.Makal, A.Idzkowski, W.Walendziuk, Bialystok Univ. of Technology (Poland)

The distributed system for collecting and analyzing selected medical data [6347-84]
J.Makal, A.Idzkowski, W.Walendziuk, M.Mironczuk, Bialystok Univ. of Technology (Poland)

Rnzyme optimization for next level molecular computing [6347-85]
P.Wasiewicz, M.Malinowski, Warsaw Univ. of Technology (Poland)

Web-based application for voice telediagnostics [6347-86]
A.Lusawa, Medical Univ. of Warsaw (Poland), A.Grzanka, Warsaw Univ. of Technology (Poland)

SESSION 13 HF CIRCUITS

Measurement system for thermal drift of propagation time in fast pulse circuits [6347-87]
P.Z.Wieczorek, Warsaw Univ. of Technology (Poland)

Temperatue compensation of step recovery diode in fast sampling circuits [6347-88]
A.Burd, K.Opalska, Warsaw Univ. of Technology (Poland)

SRD-based multistage circuit for shaping picosecond pulses [6347-89]
K.Opalska, S.Misiaszek, Warsaw Univ. Of Technology (Poland)

Shaping of steep-edge pulseswith controlled width [6347-90]
K.Opalska, S.Misiaszek, Warsaw Univ. of Technology (Poland)

Low cost programmable pulse generator with very short rise/time fall factor [6347-91]
T.Starecki, S.Misiaszek, Warsaw Univ. of Technology (Poland)

Programmable pulse generator with multiple output lines [6347-92]
H.Drabczyk, Warsaw Univ. of Technology (Poland)

New class of high-efficient intelligent cyclic ADCs. Backgrounds, methods of design and testing [6347-93]
Platonow, K.Jedrzejewski, L.Malkiewicz, J.Jasnos, Warsaw Univ. of Technology (Poland)

SESSION 14 SIMULATION AND CONTROL THEORY

Studying of compression of chirp signals with small BT and non-zero initial frequency (Invited Paper) [6347-94]
W.Pogribny, T.Leszczynski, Bydgoszcz Univ. of Technology and Agriculture (Poland)

The influence of motion parameters of automated guided vehicle on energy consumption [6347-95]
M.Kedzior, Rzeszow Univ. of Technology (Poland)

The synthesis of the linear model of the electrical circuit with an asynchronous slip-ring motor [6347-96]
P.Myszkowski, S.Kwieckowski, Bialystok Univ. of Technology (Poland)

A multiplatform graphical system for parallel solving of some problems of electrical engineering [6347-97]
R.P.Bycul, Bialystok Univ. of Technology (Poland)

Visualization of control process by means of Petri nets and database [6347-98]
A.Wegrzyn, I.Jozwiak, Univ. of Zielona Gora (Poland)

Backgrounds of two variables (2D) measurements of resistance increments by bridge cascade circuit [6347-99]
Z.L.Warsza, Polish Metrological Sociaty, Warsaw (Poland)

SESSION 15 VIRTUAL LABORATORIES AND OPTICAL INTERNET TECHNOLOGY

Prototyping of virtual photonic laboratory (Invited Paper) [6347-100]
K.Zielinski, M.Klimczak, M.Kaczkan, P.Witonski, R.Piramidowicz, Warsaw Univ. of Technology (Poland)

Real-time virtual laboratory design for coherent optoelectronic processors for 2D, 3D objects recognition [6347-101]
L.Lemieszewski, E.Ochin, Szczecin Univ. of Technology, (Poland)

Cooperation and competition in business on example of Internet research of optoelectronic companies [6347-102]
M.Kaliczynska, Opole Univ. of Technology (Poland)

Specific absorption rate computations with the use of the parallel processing [6347-103]
W.Walendziuk Bialystok Univ. of Technology (Poland)

Management system of ELHEP cluster machine for FEL photonics design [6347-104]
J.Zysik, K.T.Pozniak, R.S.Romaniuk, Warsaw Univ. of Technology (Poland)

SIP-CCME cooperation in multimedia VoIP network [6347-105]
M.Grądkowska, P.Popiel, K.Sobanska, Lublin Univ. of Technology (Poland)

Implementation of www server in SoPC [6347-106]
M.Grobelny, M.Wegrzyn, Univ. of Zielona Gora (Poland)

SESSION 16 INTELLIGENT COMPUTING IN OPTOELECTRONICS

Autonomous mobile robot fast hybrid decision system DT-FAM based on laser system measurement LSM (Invited Paper) [6347-107]
J.Bedkowski, S.Jankowski, Warsaw Univ. of Technology (Poland)

XVIII SYMPOSIUM ON PHOTONICS and HEP EXPERIMENTS
WILGA, Poland, 29 May – 04 June 2006

Wilga Symposia Permanent Patronage Committee

Prof. Jerzy Szabatin, Director of Institute of Electronic Systems, Faculty of Electronics and Information Technologies, Warsaw University of Technology (Poland)
(j.szabatin@ise.pw.edu.pl)

Prof. Andrzej Pacut, Chair of IEEE Poland Section, Institute of Control and Computation Engineering, Faculty of Electronics and Information Technologies, Warsaw University of Technology (Poland)
(a.pacut@ia.pw.edu.pl)

Prof. Marian P.Kaźmierkowski, Past Chair of IEEE Poland Section, Director of Institute of Control and Industrial Electronics, Faculty of Electrical Engineering, Warsaw University of Technology (Poland)
(mpk@isep.pw.edu.pl)

Prof. Jerzy Klamka, Association of Polish Electrical Engineers, Editor-in-Chief of Elektronika Monthly (Poland)
(elektronika@red.pl.pl)

Prof. Bogdan Galwas, Dean of the Faculty of Electronics and Information Technologies, Institute of Telecommunication, Warsaw University of Technology (Poland)
(b.galwas@elka.pw.edu.pl)

Prof. Jan Dorosz, WILGA Symposium Program Committee Chair, Faculty of Electrical Engineering, Bialystok Univ. of Technology (Poland)
(doroszjan@pb.bialystok.pl)

Prof. Ryszard S.Romaniuk, WILGA Symposium Chair, Chair of PERG/ELHEP Laboratory, Institute of Electronic Systems, FE&IT, Warsaw University of Technology, (Poland)
(r..romaniuk@spie.pl)

Prof. Tomasz R.Woliński, Chair of SPIE Poland Chapter, Director of Optics Division, Faculty of Physics, Warsaw University of Technology, (Poland)
(wolinski@if.pw.edu.pl)

Prof. Wiesław L.Woliński, Corresponding Member of Polish Academy of Sciences,
Chair of Electronics and Telecommunications Committee of Polish Academy of Sciences,
Chair of Polish Optoelectronics Committee, Association of Polish Electrical Engineers,
Institute of Micro and Optoelectronics, FE&IT, Warsaw University of Technology (Poland)
(w.wolinski@imio.pw.edu.pl)

Doc. dr hab. Grzegorz Wrochna, Acting Director of Sołtan Institute for Nuclear Studies, Warsaw (Poland) and CERN, Geneva (Switzerland)
(wrochna@fuw.edu.pl)

Wilga 2006 Symposium Committees

1. **Conference on Photonics and Electronics for Astronomy and High Energy Physics Experiments (29 May - 04 June); Chairs: R.S.Romaniuk and G.Wrochna**
2. **Conference on Photonics and Web Engineering (31 May - 03 June); Chair: J.Dorosz**
3. **Conference on Photonics Technologies (01 – 04 June); Chairs: R.Kisiel, M.Borecki, K.Pozniak**

Members

Dr **Michał Borecki**
Warsaw University of Technology (Poland)

Prof. **Bohdan S. Butkiewicz**
Warsaw Univ. of Technology (Poland)

Dr **Jan Domin**
Rzeszów University of Technology (Poland)

Prof. **Jan Dorosz**
Białystok University of Technology (Poland) – CHAIRMAN of WILGA Program Committee

Prof. **Andrzej Domański**
Warsaw University of Technology (Poland)

Prof. **Antoni Grzanka**

Warsaw University of Technology (Poland)

Prof. **Krzysztof Holejko**

Warsaw University of Technology (Poland)

Dr **Stanisław Jankowski**
Warsaw University of Technology (Poland)

Dr **Kazimierz P. Jedrzejewski**

Warsaw University of Technology (Poland)

Prof. **Miroslaw Karpierz**

Warsaw Univerity of technology (Poland)

Dr **Ryszard Kisiel**
Warsaw University of Technology (Poland)

Dr **Krzysztof Kulpa**
Warsaw University of Technology (Poland)

Prof. **Lech Mankiewicz**
Center of Theoretical Physics, Polish Academy of Sciences, Warsaw (Poland)

Dr **Bhaskar Mukherjee**

DESY, Hamburg (Germany)

Dr **Krzysztof T.Poźniak**
Warsaw University of Technology (Poland)

Mr **Michal Ramotowski**

Warsaw University of Technology (Poland)

ELHEP Group Coordinator

Prof. **Ryszard S.Romaniuk**
Warsaw University of Technology (Poland)

Dr **Jacek Sekutowicz**

DESY, Hamburg (Germany)

Prof. **Edward Sędek**
Industrial Institute of Telecommunications, Warsaw (Poland)

Dr **Stefan N. Simrock**
DESY, Hamburg (Germany)

Dr **Tomasz Starecki**
Warsaw University of Technology (Poland)

Prof. **Małgorzata Suchańska**
Kielce University of Technology (Poland)

Dr **Feliks Szczot**
Opole University of Technology (Poland)

Dr **Jerzy Weremczuk**

Warsaw University of Technology (Poland)

Prof. **Tomasz R.Wolinski**

WarsawUniversity of Technology (Poland)

Prof. **Waldemar Wójcik**
Lublin University of Technology (Poland)

Prof. **Grzegorz Wrochna**
Sołtan Institute for Nuclear Studies, Warsaw (Poland)
and CERN, Geneva (Switzerland)

Wilga 2006 Session Chairs/Editors

1. LLRF measurement and control system for TESLA technology VUV-FEL, European X-FEL and ILC - Part I: Hardware

Jacek Sekutowicz, DESY, Hamburg (Germany)
Stefan Simrock, DESY, Hamburg (Germany)
Ryszard S.Romaniuk, Warsaw University of Technology (Poland)

2. LLRF measurement and control system for TESLA technology VUV-FEL, European X-FEL and ILC - Part II: Software
Ryszard S.Romaniuk, Warsaw Univ. of Technology (Poland)
Krzysztof T.Poźniak, Warsaw Univ. of Technology (Poland)

3. Experiments in space research, astronomy and astroparticle physics
Grzegorz Wrochna, Sołtan Institute for Nuclear Studies, Warsaw (Poland) and CERN, Geneva (Switzerland)

4. Bragg gratings and nonlinear optical dibers
Kazimierz Jedrzejewski, Warsaw Univ. of Technology (Poland)

5. Capillary and ring-core optical fibers
Ryszard S.Romaniuk, Warsaw Univ. of Technology (Poland)

6. Materials for optical fiber technology
Jan Dorosz, Bialystok University of Technology (Poland)

7. Photoacoustics
Tomasz Starecki, Warsaw University of Technology (Poland)

8. Optoelectronic equipment
Krzysztof Holejko, Warsaw University of Technology (Poland)

9. Optical Fiber Sensors and Lighting Technology
Michal Borecki, Warsaw University of Technology (Poland)

10. Optical Interconnections, Packaging, Soldering, and RFID Technology
Ryszard Kisiel, Warsaw University of Technology (Poland)

11. Biometrics
Andrzej Pacut, Warsaw University of Technology (Poland)

12. Biomedical applications of photonic and electronic systems
Antoni Grzanka, Warsaw University of Technology (Poland)
Jerzy Weremczuk, Warsaw University of Technology (Poland)

13. HF Circuits
Tomasz Starecki, Warsaw Univ. of Technology (Poland)
Michal Ramotowski, Warsaw University of Technology (Poland)

14. Simulation and Control Theory
Jan Domin, Rzeszow University of Technology (Poland)

15. Virtual Laboratories and Optical Internet Technology
Tomasz Starecki, Warsaw University of Technology (Poland)

16. Intelligent computing in optoelectronics
Stanisław Jankowski, Warsaw University of Technology (Poland)

Wilga 2006 Conference Organizing Committee

Tomasz Czarski, PERG-ELHEP Laboratory, IES, Warsaw University of Technology

Wojciech Jałmużna, PERG-ELHEP Laboratory, IES, Warsaw University of Technology (w.jalmuzna@elka.pw.edu.pl)

Paweł Kaleta, PERG-ELHEP Laboratory, IES, Warsaw University of Technology (p.kaleta@elka.pw.edu.pl)

Arkadiusz Kalicki, PERG-ELHEP Laboratory, IES, Warsaw University of Technology (a.kalicki@elka.pw.edu.pl)

Waldemar Koprek, PERG-ELHEP Laboratory, IES, Warsaw University of Technology (wkoprek@elka.pw.edu.pl)

Krzysztof Ołowski, PERG-ELHEP Laboratory, IES, Warsaw University of Technology (k.olowski@elka.pw.edu.pl)

Maria Piłka, Director of WUT WILGA Resort

Krzysztof T.Poźniak, PERG-ELHEP Laboratory, IES, Warsaw University of Technology, Committee Staff Coordinator (pozniak@ise.pw.edu.pl)

Karol Perkuszewski, PERG-ELHEP Laboratory, IES, Warsaw University of Technology (k.perkuszewski@elka.pw.edu.pl)

Piotr Pucyk, PERG-ELHEP Laboratory, IES, Warsaw University of Technology (ppucyk@elka.pw.edu.pl)

Michał Ramotowski, PERG-ELHEP Laboratory, IES, Warsaw University of Technology, Student Mentor (mira@op.pl),

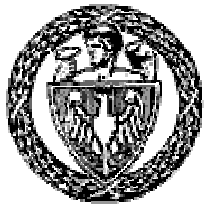
Dominik Rybka, PERG-ELHEP Laboratory, IES, Warsaw University of Technology (drybka@elka.pw.edu.pl), CHAIR of the Organizing Committee

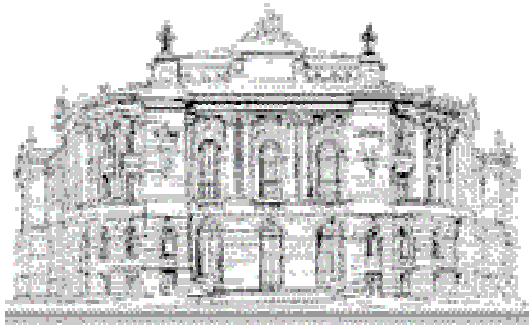
Jarosław Szewiński, PERG-ELHEP Laboratory, IES, Warsaw University of Technology (j.szewinski@elka.pw.edu.pl**)**

Jerzy Zieliński, PERG-ELHEP Laboratory, IES, Warsaw University of Technology, ee Deputy-Chair (j.zielinski@elka.pw.edu.pl)

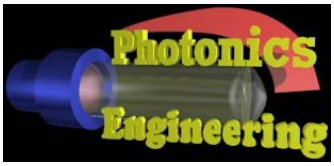
Jacek Zysik,, PERG-ELHEP Laboratory, IES, Warsaw University of Technology

Wilga 2006 Conference Organizers





- Warsaw University of Technology



- PERG/ELHEP Laboratory (http://www.ise.pw.edu.pl/~rrom),
  Institute of Electronic Systems, (http://www.ise.pw.edu.pl),
  Faculty of Electronics and Information Technologies (http://www.elka.pw.edu.pl),
  Warsaw University of Technology (http://www.pw.edu.pl)

- IEEE Student Branch of WUT
  IEEE Poland Section (http://www.ee.pw.edu.pl/ieee)

Wilga Symposium Sponsors

- IEEE Poland Section and IEEE Region 8 (SAC&GOLD)
- SPIE Poland Chapter
- Committee of Electronics and Telecommunications
  Polish Academy of Sciences
- Polish Committee of Optoelectronics
  Association of Polish Electrical Engineers
- Inter-Association Committee of Electronics,
  Telecommunication and Information Technologies,
  Association of Polish Electrical Engineers
  Association of Polish Mechanical Engineers
- Faculty of Electronics and Information Technologies
  Warsaw University of Technology
- Institute of Electronic Systems, FE&IT
  Warsaw University of Technology

Wilga Symposium – Cooperating Institutions

-  **Faculty of Physics, Warsaw University (Poland)**
-  **Sołtan Institute of Nuclear Studies, Warsaw (Poland)**
- 

DESY, Hamburg (Germany)
- 

CERN, Geneva (Switzerland)
- 

TTC, TESLA Technology Collaboration
TeV Energy Superconducting Linear Accelerator
- 

CARE Project
Coordinated Accelerator Research in Europe (by ESGARD)
- 

ELAN – European Linear Accelerator Network

XVIII IEEE-SPIE Symposium on Photonics and Web Engineering
Photonics & Electronics for Accelerators and HEP
WILGA 29 May – 4 June 2006
http://wilga.ise.pw.edu.pl

Students, WILGA 2006 Symposium participants, are listening to the opening address by professor Andrzej Pacut – President of IEEE Poland Section.

The Symposium on Photonics and Web Engineering has been organized since nine years, two times a year alternately, in January at the Faculty of Electronics and Information Technologies, Warsaw University of Technology (Poland) and at the end of May in WILGA Resort owned by Warsaw Univ. of Technology. Two big international Institutes keep patronage over the Symposium, IEEE-The Institute of Electrical and Electronics Engineers (especially Region 8) and SPIE-The International Society for Optical Engineering. In Poland, the Symposium is under the high patronage of Committee of Electronics and Communications, Polish Academy of Sciences, Polish Optoelectronics Committee of the Association of Polish Electrical Engineers and Warsaw University of Technology. Since several years, the Symposium is also under the patronage of two big European nuclear and high energy physics research centers: CERN in Geneva and DESY in Hamburg and European research programs and excellence networks: CARE-Coordinated Accelerated research in Europe, ELAN-European Linear Accelerator Network, ILC-International Linear Collider, TESLA Technology Collaboration. Logos of these institutions are in the header of this report. The host of the Symposium is the PERG/ELHEP Research Group from Institute of Electronic Systems, Warsaw University of Technology (WUT) as well as IEEE Student Branch, IEEE Poland Section. The Patronage Committee of the Symposium consists of leading experts in the Symposium subjects.

The area of interest of the IEEE-SPIE WILGA 2006 Symposium is defined by the work realized by young scientists and engineers, M.Sc. and Ph.D. students at the university faculties of electrical and electronics engineering, information technology, technical physics and mechatronics. Each year has a slightly different topical emphasis. Each year a few clearly visible topical branches can be distinguished.

The photographs below show the WILGA Symposium participants during the following days: 29 May, 30 May, 1 June, 2 June and 3 June 2006.


IEEE
POLAND
SECTION
UNDED 1972
25 YEARS
TO THE PROFESSION
1997


IEEE
POLAND
SECTION
FOUNDED 1972


IEEE
POLAND
SECTION

These topics for WILGA 2006 were: superconductive RF technology for accelerators, free electron lasers, optoelectronic technology, optoelectronic materials characterization, optical broadband Internet, optical fiber sensors, optoelectronic measurements, wireless sensory networks, modeling and control of industrial processes, microsystems for measurements in biomedicine and agriculture, biomedical engineering systems, advanced PCB technology, lead-less soldering and packaging technology, RFID, image processing, liquid crystal optical fibers, information safety, intelligent transmission and data processing systems, optical and optoelectronic computing, 3D object imaging, photo acoustics, femtosecond sampling techniques, Bragg grating optical fibers, cluster calculation and decomposition. Special sessions were designed for European FP6 programs: CARE-Coordinated Accelerator Research in Europe, Hand on Universe – Europe, Pi-of-the-sky observations of Gamma Ray Bursts and Optical Flashes.

Among others, the following sessions were of the utmost interest for the IEEE-SPIE WILGA 2006 participants:

- Observations of cosmic GRB flashes and optical companions,
- Advanced photonic and electronic systems for biomedicine,
- Biometry for information protection,
- Photoacoustics and femtosecond pulse techniques,
- Ecological soldering technologies and optoelectronic PCBs,
- Advances in optical fiber technology,
- Optical fiber sensors,
- Liquid crystal optical fibers,
- Optoelectronic artificial neural networks,
- Beam research for free electron lasers,
- Advanced control systems for superconducting accelerators.

Each of these sessions featured a digest paper and a few research communications.

The IEEE-SPIE WILGA 2006 Symposium was attended together by over than 250 participants. There were presented more than 200 contributed research papers and around 20 invited digest papers. WILGA's custom is that particular topical sessions are organized by leading experts in their fields. The experts are representatives of academia, business and industry. This year, the representatives of the following institutions were actively present: Institute of Micro and Optoelectronics WUT, Institute of Electronic Systems WUT, Institute of Control and Computation Engineering WUT, Faculty of Physics WUT, Faculty of Mechatronics WUT, Tele&Radio Research Institute, Soltan Institute of Nuclear Problems, Technical Universities of: Łódź, Wrocław, Rzeszów, Gdańsk, Lublin, Academy of Mining and Metallurgy (AGH) in Kraków, Military Academy of Technology (WAT) in Warsaw, Poznań, Kielce, Silesian in Gliwice, Białystok, Szczecin, Opole, Warsaw and Universities: Maria Curie-Skłodowska in Lublin, Zielona Góra and Cardinal Stefan Wyszyński in Warsaw. With regret we have noticed the lack of Technical Universities of: Kraków, Częstochowa, Radom, Koszalin and Academy of Technology and Agriculture (ATR) in Bydgoszcz.

The IEEE-SPIE WILGA 2006 Symposium lasted the whole week. The meeting rule is that no parallel sessions are envisaged, neither the poster ones. All work is presented orally in English by young scientists. The presentations are usually subject to long, hot and interesting discussion, run by the students, during the plenary sessions, attended by young participants in large quantities. Peer reviewed proceedings of IEEE-SPIE WILGA 2006 will be traditionally issued by the international series Proceedings of SPIE in USA [www.spie.org]. Chosen papers will be printed in a special issue of ELECTRONICS Monthly, a journal by the Association of Polish Electrical Engineers. This journal has a press patronage over the WILGA Symposium. Some of papers will be published in Electronics and Telecommunications Quarterly by Polish Academy of Sciences and some ISI journals like Optica Applicata, Nuclear Instruments and Methods in Physical Research and others.

The level of presented papers varied during the symposium. It is caused by a unique rule of this meeting allowing for presentation (but not publication) almost finished B.Sc. work, M.Sc. theses and Ph.D. theses at very different stage of completion. It is to be anticipated that the level of presentation of a Ph.D thesis which was just started is different from that near completion. However, the tutor of a Ph.D. student, who participates in the symposium, may be sure that WILGA is a

good school of work presentation in international environment. Additionally, the advanced Ph.D. student has a chance to publish his/her work in renowned proceedings series. All work chosen for publication are peer reviewed.

The IEEE-SPIE WILGA Symposium has no admission fee. The choice of the place is connected with the lowest possible costs of accommodation and food. The costs are even lower because of the support from the IEEE Poland Section, provided for the students IEEE members. The IEEE-SPIE WILGA Symposia have no permanent Scientific Committee. Such a Committee is called during the Symposium out of experts, organizers of topical sessions and university professors attending personally the WILGA meetings. The work presented by students and young researchers are evaluated by their tutors and mentors, by the Scientific Committee, by the auditorium present during the session and finally by the Publication Committee of the WILGA Proceedings. Only the papers presented during the Symposium are published. There are published only the own research work results obtained personally by the students. These are mainly the extended summaries of the M.Sc. and Ph.D. theses.

As is observed from quite long lasting practice, such rules are very convenient for the students and they accept them with large support. A proof of such a support is a large number of students and young researchers participating annually in the IEEE-SPIE WILGA Symposium. WILGA 2006 gathered more than 250 young researchers, while WILGA 2005 did 300 from nearly all Technical Universities all over the country (and a few tens of people from abroad). The essential meaning for young researchers has a reviewed publication in the international proceedings (Proc.SPIE), which is available all over the world. IEEE-SPIE WILGA Symposium is unique in many respects. There are presented each time more than 200 M.Sc. and Ph.D. theses in one place representing uniquely state-of-the-art and evolution of the young science, in photonics, advanced electronics and information technologies, in this country and neighboring regions. Evolution, because the large percentage of young researchers change each year in WILGA. This stems from the rapid advances of their thesis work done at their alma mater.

The future of WILGA Symposium depends almost totally on young researchers, who would like to meet with the like colleagues on a serious research platform. Partly, the success relies on the tutors and mentor of young researchers, who would want to notice the symposium's high research level. The future practically does not depend on the financial and organizational layers. The Symposium is organized by students volunteers for students, mainly members of IEEE and SPIE Institutes. This makes a large difference with other similar events. During the regular conferences the students events are frequently only an addition to the "adolescent" sessions. On the other hand, typical student workshops are frequently a method of going out of the school with regular lectures. The IEEE-SPIE WILGA symposium narrows all the formalisms to the needed minimum. This minimum is keeping the work at the highest possible level.

There is a large and increasing competition on the market of research conferences. There were organized a considerable number of conferences in the subjects covered by WILGA in this geographical region. Some of them were large, serious and of big research , economical and international impact. Some organizers of these events have quite big ambitions. The competition stems from solid reasons like protection of high level of proceedings, struggle for money, seeking for international programs, normalized points for parametric evaluation of research institutions, etc. WILGA symposium is a difficult competitor in this game, because it does not fight for these privileges, or perhaps seeks for them in a completely different way. Despite this, the organizers of IEEE-SPIE WILGA Symposium feel the pressure from the influential research groups. The pressure stems from the incredible success which WILGA won among young researchers during the last years.

A tradition of WILGA is that a few sessions are started with some humanistic plenary papers. This year, a paper was prepared by professor Tadeusz Morawski on a subtle literary forms which are palindromes. Prof. Morawski is an author of two books on these literary pieces of art. The second paper was delivered by dr R.Kossowski on mathematical approach to ethics and differentiation of weak and strong ethics.

Professor Ryszard S.Romaniuk
Warsaw University of Technology