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Ryszard S. Romaniuk
Krzysztof S. Kulpa
Editors

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Contents

xi	<i>WILGA 2010 Symposium Committees</i>
xiii	<i>Introduction</i>

DEVELOPMENT OF PHOTONICS AND ELECTRONICS IN EUROPE AND POLAND

7745 02	Photonics applications and web engineering: SPIE-PSP WILGA Symposium series [7745-43] R. S. Romaniuk, Warsaw Univ. of Technology (Poland)
7745 03	WILGA Photonics and Web Engineering 2010 [7745-44] R. S. Romaniuk, Warsaw Univ. of Technology (Poland)
7745 04	Electronics and telecommunications in Poland, issues and perspectives: Part I. Society and education [7745-06] J. Modelski, R. S. Romaniuk, Warsaw Univ. of Technology (Poland)
7745 05	Electronics and telecommunications in Poland, issues and perspectives: Part II. Science, research, development, higher education [7745-07] J. Modelski, R. S. Romaniuk, Warsaw Univ. of Technology (Poland)
7745 06	Electronics and telecommunications in Poland, issues and perspectives: Part III. Innovativeness, applications, economy, development scenarios, politics [7745-08] J. Modelski, R. S. Romaniuk, Warsaw Univ. of Technology (Poland)
7745 07	Development of laser technology in Poland [7745-05] J. Gajda, West Pomeranian Univ. of Technology in Szczecin (Poland); R. S. Romaniuk, Warsaw Univ. of Technology (Poland)
7745 08	Optical fiber technology development in Poland [7745-04] W. Wójcik, Lublin Univ. of Technology (Poland); R. Romaniuk, Warsaw Univ. of Technology (Poland)
7745 09	EuCARD 2010: European coordination of accelerator research and development [7745-79] R. S. Romaniuk, Warsaw Univ. of Technology (Poland)

PHOTONICS APPLICATIONS IN ASTRONOMY AND SPACE TECHNOLOGY

7745 0A	BRITE-PL: the first Polish scientific satellite [7745-36] P. Orleanski, R. Graczyk, M. Rataj, Space Research Ctr. (Poland); A. Schwarzenberg-Czerny, Nicolaus Copernicus Astronomical Ctr. (Poland); T. Zawistowski, Space Research Ctr. (Poland); R. E. Zee, Univ of Toronto Institute for Aerospace Studies (Canada)
---------	--

- 7745 0B **Application of digital control techniques for satellite medium power DC-DC converters** [7745-11]
K. R. Skup, P. Grudzinski, W. Nowosielski, P. Orleanski, R. Wawrzaszek, Space Research Ctr. (Poland)
- 7745 0C **SPEKTROP DPU: optoelectronic platform for fast multispectral imaging** [7745-41]
R. Graczyk, P. Sitek, M. Stolarski, Space Research Ctr. (Poland)
- 7745 0D **Improving photometry of the Pi of the Sky** [7745-31]
K. Małek, L. Mankiewicz, R. Opiela, Ctr. for Theoretical Physics (Poland); M. Sokołowski, Andrzej Sołtan Institute for Nuclear Studies (Poland); A. F. Żarnecki, Univ. of Warsaw (Poland)
- 7745 0E **Pi of the Sky catalogue of the variable stars from 2006-2007 data** [7745-60]
A. Majczyna, Andrzej Sołtan Institute for Nuclear Studies (Poland); M. Siudek, Ctr. for Theoretical Physics (Poland); M. Należyty, Univ. of Warsaw Astronomical Observatory (Poland); K. Małek, Ctr. for Theoretical Physics (Poland); A. Barnacka, Copernicus Astronomical Ctr. (Poland); L. Mankiewicz, Ctr. for Theoretical Physics (Poland); A. F. Żarnecki, M. Ćwiok, Univ. of Warsaw (Poland); M. Sokołowski, Andrzej Sołtan Institute for Nuclear Studies (Poland)
- 7745 0F **Analysis of Cepheids based on photometric data from the "Pi of the Sky" experiment** [7745-63]
M. Siudek, Ctr. for Theoretical Physics (Poland); A. Barnacka, Copernicus Astronomical Ctr. (Poland); M. Ćwiok, Univ. of Warsaw (Poland); A. Majczyna, Andrzej Sołtan Institute for Nuclear Studies (Poland); L. Mankiewicz, K. Malek, Ctr. for Theoretical Physics (Poland); M. Sokołowski, Andrzej Sołtan Institute for Nuclear Studies (Poland); A. F. Żarnecki, Univ. of Warsaw (Poland)
- 7745 0G **Estimation of space debris detection possibility by Pi of the Sky telescopes** [7745-61]
M. Należyty, Univ. of Warsaw Astronomical Observatory (Poland); A. Majczyna, Andrzej Sołtan Institute for Nuclear Studies (Poland); R. Wawrzaszek, Space Research Ctr. (Poland); M. Sokołowski, Andrzej Sołtan Institute for Nuclear Studies (Poland)

OPTOELECTRONICS AND OPTICAL FIBER TECHNOLOGY

- 7745 0H **Fiber laser with loop reflector** [7745-73]
P. Florczyk, K. Anders, P. Gdula, A. Jusza, R. Piramidowicz, Warsaw Univ. of Technology (Poland)
- 7745 0I **Application of an optical parametric generator to cavity enhanced experiment** [7745-55]
B. Rutecka, J. Wojtas, Z. Bielecki, J. Mikołajczyk, M. Nowakowski, Military Univ. of Technology (Poland)
- 7745 0J **Degree of polarization fading of light passing through birefringent medium with optical axis variation** [7745-72]
P. L. Makowski, A. W. Domański, Warsaw Univ. of Technology (Poland)
- 7745 0K **Problem of degree of polarization for photons** [7745-70]
L. Michalik, J. Jasinski, P. L. Makowski, A. W. Domański, Warsaw Univ. of Technology (Poland)

- 7745 OL **Spectroscopic properties of Yb³⁺/Er³⁺-doped antimony-phosphate glasses** [7745-56]
J. Żmojda, D. Dorosz, M. Kochanowicz, J. Dorosz, Białystok Univ. of Technology (Poland)
- 7745 OM **Phase-locking of 7-core Yb³⁺-doped optical fiber** [7745-59]
M. Kochanowicz, D. Dorosz, J. Żmojda, Białystok Univ. of Technology (Poland)
- 7745 ON **Atlas of thorium standard spectrum for the grating 1300 lines/mm mounted at PGS-2 spectrograph** [7745-17]
J. Domin, Ł. Blicharz, J. Majowicz, R. Stagraczyński, Rzeszów Univ. of Technology (Poland)
- 7745 OO **Measurement of the Poisson's ratio for the fibers using diffraction method** [7745-25]
B. Gołębowska, T. Więcek, A. Wasilewski, Rzeszów Univ. of Technology (Poland)
- 7745 OP **Design of integrated photonic transmitter for application in fiber-to-the-home systems** [7745-69]
K. Ławniczuk, Warsaw Univ. of Technology (Poland) and Eindhoven Univ. of Technology (Netherlands); R. Piramidowicz, P. Szczepański, Warsaw Univ. of Technology (Poland); M. K. Smit, X. J. M. Leijtens, Eindhoven Univ. of Technology (Netherlands)

PHOTONICS AND IT APPLICATIONS IN BIOLOGY AND MEDICINE

- 7745 OQ **Computer-assisted detection of epileptiform focuses on SPECT images** [7745-22]
D. Grzegorzczak, Warsaw Univ. of Technology (Poland); D. Dunin-Wąsowicz, The Children's Memorial Health Institute (Poland); J. J. Mulawka, Warsaw Univ. of Technology (Poland)
- 7745 OR **On exploration of medical database of Crohn's disease** [7745-58]
A. Manerowska, Warsaw Univ. of Technology (Poland); M. Dądałski, P. Socha, The Children's Memorial Health Institute (Poland); J. Mulawka, Warsaw Univ. of Technology (Poland)
- 7745 OS **On tensor calculations via parallel programming** [7745-42]
K. Roszkowski, J. J. Mulawka, Warsaw Univ. of Technology (Poland)
- 7745 OT **Automatic measurement of carotid IMT in children** [7745-52]
D. Gruszczyński, The Children's Memorial Health Institute (Poland); M. Lisiecki, Warsaw Univ. of Technology (Poland)
- 7745 OU **Implementation of expert system in Prolog for infant seizures** [7745-62]
M. Gawet, E. Tataj, Warsaw Univ. of Technology (Poland); D. Dunin-Wąsowicz, The Children's Memorial Health Institute (Poland)
- 7745 OV **Young addicted men hormone profile detection** [7745-27]
P. Zieliński, Warsaw Univ. of Technology (Poland) and Univ. of Warsaw (Poland); P. Wąsiewicz, Warsaw Univ. of Technology (Poland); B. Leszczyńska, J. Gromadzka-Ostrowska, Warsaw Univ. of Life Sciences (Poland)
- 7745 OW **Tactical assessment in a squad of intelligent bots** [7745-30]
M. Gołubiński, P. Wąsiewicz, Warsaw Univ. of Technology (Poland)

- 7745 0X **Medical diagnosis and treatment using high-resolution manometry with computer-aided system** [7745-38]
T. Pedowski, Medical Univ. of Lublin (Poland); P. Wąsiewicz, Warsaw Univ. of Technology (Poland); R. Maciejewski, Medical Univ. of Lublin (Poland) and Rzeszów Univ. of Information Technology (Poland); G. Wallner, Medical Univ. of Lublin (Poland)
- 7745 0Y **Cluster analysis application in research on pork quality determinants** [7745-65]
W. Przybylski, Warsaw Univ. of Life Sciences (Poland); P. Wąsiewicz, Warsaw Univ. of Technology (Poland); P. Zieliński, Warsaw Univ. of Technology (Poland) and Univ. of Warsaw (Poland); J. Gromadzka-Ostrowska, E. Olczak, D. Jaworska, Warsaw Univ. of Life Sciences (Poland); S. Niemyjski, PenArLan (Poland); V. Santé-Lhoutellier, Quality of Animal Products, INRA (France)
- 7745 0Z **Phosphorylation prediction for proteins by LS-SVM with string kernel** [7745-77]
J. Węćławski, S. Jankowski, Warsaw Univ. of Technology (Poland)
- 7745 10 **Improved k-nearest neighbor classifier for biomedical data based on convex hull of inverted set of points** [7745-68]
Z. Szymański, M. Dwulit, Warsaw Univ. of Technology (Poland)

ACOUSTIC SIGNAL PROCESSING

- 7745 11 **Acceleration of feature extraction for FPGA-based speech recognition** [7745-28]
V. Arminas, Vilnius Gediminas Technical Univ. (Lithuania); G. Tamulevičius, Institute of Mathematics and Informatics (Lithuania); D. Navakauskas, E. Ivanovas, Vilnius Gediminas Technical Univ. (Lithuania)
- 7745 12 **Development of the hidden Markov models based Lithuanian speech recognition system** [7745-33]
Ž. Ringelienė, A. Lipeika, Institute of Mathematics and Informatics (Lithuania)
- 7745 13 **Integrating hidden Markov model and PRAAT: a toolbox for robust automatic speech transcription** [7745-49]
A. Kabir, Technical Univ. of Cluj-Napoca (Romania); J. Barker, The Univ. of Sheffield (United Kingdom); M. Giurgiu, Technical Univ. of Cluj-Napoca (Romania)
- 7745 14 **Copula filtration of spoken language signals on the background of acoustic noise** [7745-47]
L. V. Kolchenko, R. B. Sinityn, National Aviation Univ. (Ukraine)
- 7745 15 **Some aspects of acoustic analysis of chosen vowels** [7745-34]
J. Kołodziejki, Kielce Univ. of Technology (Poland)

OPTOELECTRONIC AND ELECTRONIC, IMAGE PROCESSING, MATERIAL NANOTECHNOLOGY

- 7745 16 **Comparison of distance measures according to suitability for 2D electrophoresis image registration using synthetic image data and SOFM** [7745-14]
D. Matuzevičius, D. Navakauskas, Vilnius Gediminas Technical Univ. (Lithuania)
- 7745 17 **Integrated circuit layer image segmentation** [7745-64]
G. Masalskis, R. Petrauskas, Vilnius Gediminas Technical Univ. (Lithuania)

- 7745 18 **Some aspects of using the Hyperchem software in study of Ni-C nanostructures** [7745-23]
R. Belka, K. Piwowarczyk, Kielce Univ. of Technology (Poland)
- 7745 19 **Method of preparation of silver nanopowder** [7745-15]
M. Jarosz, Warsaw Univ. of Technology (Poland) and Institute of Electronic Materials Technology (Poland); A. Młóżniak, Warsaw Univ. of Technology (Poland); M. Jakubowska, Warsaw Univ. of Technology (Poland) and Institute of Electronic Materials Technology (Poland)
- 7745 1A **Printed electronic on flexible and glass substrates** [7745-57]
K. Futera, Tele & Radio Research Institute (Poland) and Warsaw Univ. of Technology (Poland); M. Jakubowska, Warsaw Univ. of Technology (Poland); G. Kozioł, Tele & Radio Research Institute (Poland)
- 7745 1B **Screen printed UHF antennas on flexible substrates** [7745-54]
K. Janeczek, Tele & Radio Research Institute (Poland); A. Młóżniak, Institute of Electronic Materials Technology (Poland); G. Kozioł, A. Araźna, Tele & Radio Research Institute (Poland); M. Jakubowska, Institute of Electronic Materials Technology (Poland) and Warsaw Univ. of Technology (Poland); P. Bajurko, Warsaw Univ. of Technology (Poland)

**PHOTONICS CO-OPERATION WITH ADVANCED ELECTRONIC SYSTEMS: FPGA-DSP
MICROPROCESSOR TECHNOLOGY**

- 7745 1C **The firmware of the front-end driver for the data acquisition system of the TOTEM experiment** [7745-67]
A. Fiergolski, Warsaw Univ. of Technology (Poland); M. Quinto, National Institute of Nuclear Physics (Italy)
- 7745 1D **Multiple source navigation signal generator** [7745-51]
P. Bojda, Univ. of Defence (Czech Republic)
- 7745 1E **Dual port memory based parallel programmable architecture for DSP in FPGA** [7745-66]
W. M. Zabołotny, Warsaw Univ. of Technology (Poland)
- 7745 1F **C to VHDL compiler** [7745-46]
P. P. Berdychowski, W. M. Zabołotny, Warsaw Univ. of Technology (Poland)
- 7745 1G **Parameterized hardware description as object oriented hardware model implementation** [7745-12]
P. K. Drabik, Warsaw Univ. of Technology (Poland)
- 7745 1H **Integration of multi-interface conversion channel using FPGA for modular photonic network** [7745-74]
T. Janicki, K. T. Poźniak, R. S. Romaniuk, Warsaw Univ. of Technology (Poland)
- 7745 1I **Parameterized diagnostic module implemented in FPGA structures** [7745-71]
A. Zagoździńska, K. T. Poźniak, R. S. Romaniuk, Warsaw Univ. of Technology (Poland)

**PHOTONICS CO-OPERATION WITH ADVANCED ELECTRONIC SYSTEMS: DSP, FILTERS,
MODULATION TECHNOLOGIES**

- 7745 1J **STAP approach for DOA estimation using microphone arrays** [7745-32]
V. Behar, Institute for Parallel Processing (Bulgaria); C. Kabakchiev, Sofia Univ. (Bulgaria);
V. Kyovtorov, Institute of Information Technologies (Bulgaria)
- 7745 1K **Detection improving techniques for Hough detector in presence of randomly arriving
impulse interference** [7745-45]
L. A. Doukovska, D. S. Angelova, Institute of Information and Communication Technologies
(Bulgaria)
- 7745 1L **Some generalization of discrete convolution** [7745-24]
B. S. Butkiewicz, Warsaw Univ. of Technology (Poland)
- 7745 1M **The influence of non-uniform sampling in the IEC flicker metering** [7745-21]
V. Kyovtorov, Institute of Information Technologies (Bulgaria); H. Kabakchiev, Sofia Univ.
(Bulgaria); V. Behar, Institute for Parallel Processing (Bulgaria)
- 7745 1N **2DE gel image preprocessing using self-organising maps** [7745-13]
A. Serackis, D. Matuzevičius, D. Navakauskas, Vilnius Gediminas Technical Univ. (Lithuania)
- 7745 1O **Orthogonal frequency division multiplexing based DS-SS Barker code for resistance to
AWGN and multipath** [7745-10]
A.-R. Al-Qawasmi, Philadelphia Univ. (Jordan); A. Al-Lawama, Mutah Univ. (Jordan)
- 7745 1P **A new class of fully active reconfigurable filters for cognitive communications** [7745-35]
Y. Lakys, A. Fabre, IMS Lab. CNRS, Univ. Bordeaux 1 (France); B. Godara, Institut Supérieur
d'Electronique de Paris (France)
- 7745 1Q **Multilateration surveillance system arrangement at the airport area** [7745-48]
I. Konchenko, F. Yanovsky, National Aviation Univ. (Ukraine)
- 7745 1R **Optimal forward regression for landmine detection by thermal sensing** [7745-75]
L. Del Vecchio, P. Fallavollita, S. De Marco, S. Esposito, M. Balsi, Univ. degli Studi di Roma La
Sapienza (Italy); S. Jankowski, Warsaw Univ. of Technology (Poland)
- 7745 1S **Laplacian filtered minimum shift keying modulation** [7745-39]
I. N. Abu-Isbeih, Philadelphia Univ. (Jordan); M. Maqusi, Texas Tech Univ. (United States)
- 7745 1T **Universal DSP module interface** [7745-02]
R. Cieszewski, M. Linczuk, Warsaw Univ. of Technology (Poland)
- 7745 1U **Experimental chaos in switched power supply** [7745-78]
J. Frąckiewicz, Warsaw Univ. of Technology (Poland)

**PHOTONICS CO-OPERATION WITH ADVANCED AND ELECTRONIC SYSTEMS: EMI, RADIO,
RADAR TECHNOLOGIES**

- 7745 1V **Land border monitoring with remote sensing technologies** [7745-18]
R. Malinowski, Space Research Ctr. (Poland)

- 7745 1W **Universal software radio peripheral as a receiver and DSP platform for a passive radar** [7745-16]
B. Szlachetko, A. Lewandowski, G. Haza, Wrocław Univ. of Technology (Poland)
- 7745 1X **Influence of RF channels mismatch and mutual coupling phenomenon on performance of a multistatic passive radar** [7745-20]
R. Hossa, M. Górski, Wrocław Univ. of Technology (Poland)
- 7745 1Y **Analysis of EMP generated by explosion in tunnels** [7745-40]
M. Chikhradze, N. Bochorishvili, I. Akhvlediani, E. Mataradze, G. Tsulukidze Mining Institute (Georgia)
- 7745 1Z **Secure real-time wireless video streaming in the aeronautical telecommunications network** [7745-29]
P. Czernik, J. Olszyna, Warsaw Univ. of Technology (Poland)
- 7745 20 **Design and implementation of cross-channel interference suppression for polarimetric LFM-CW radar** [7745-53]
G. Babur, Z. Wang, O. A. Krasnov, L. P. Ligthart, Delft Univ. of Technology (Netherlands)
- 7745 21 **Seasonal & Annual Change Monitoring** [7745-19]
S. Aleksandrowicz, M. Stelmaszczuk, Space Research Ctr. (Poland); Z. Bochenek, S. Lewiński, K. Turlej, Institute of Geodesy and Cartography (Poland); A. Groom, Infoterra UK (United Kingdom); A. Metz, T. Esch, German Aerospace Ctr. (Germany); E. Gurova, G. Vaitkus, Aerogeodezijos Institutas UAB (Lithuania)
- 7745 22 **GSM signal reconstruction with MLSE detection** [7745-09]
P. Krysik, Warsaw Univ. of Technology (Poland)

Author Index

WILGA 2010 Symposium Committees

WILGA Symposium Steering Committee

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WILGA 2010 Symposium Session Chairs

- 1 Development of Photonics and Electronics in Europe and Poland
Ryszard S. Romaniuk, Warsaw University of Technology (Poland)
- 2 Photonics Applications in Astronomy and Space Technology
Lech Mankiewicz, Polish Academy of Sciences, Warsaw (Poland)
Filip A. Żarnecki, Warsaw University (Poland)
- 3 Optoelectronics and Optical Fiber Technology
Tomasz R. Woliński, Warsaw University of Technology (Poland)
Andrzej W. Domański, Warsaw University of Technology (Poland)
Michał Borecki, Warsaw University of Technology (Poland)
- 4 Photonics and IT Applications in Biology and Medicine
Jan J. Mulawka, Warsaw University of Technology (Poland)
Stanisław Jankowski, Warsaw University of Technology (Poland)
- 5 Acoustic Signal Processing
Krzysztof S. Kulpa, Warsaw University of Technology (Poland)
- 6 Optoelectronic and Electronic, Image Processing, Material Nanotechnology
Małgorzata Jakubowska, ITME and Warsaw University of Technology (Poland)
Jan Domin, Rzeszów University of Technology (Poland)
Małgorzata Suchańska, Kielce University of Technology (Poland)
- 7 Photonics Co-operation with Advanced Electronic Systems: FPGA-DSP Microprocessor Technology
Krzysztof T. Poźniak, Warsaw University of Technology (Poland)
Michał Ramotowski, Warsaw University of Technology (Poland)
- 8 Photonics Co-operation with Advanced Electronic Systems: DSP, Filters, Modulation Technologies
Krzysztof S. Kulpa, Warsaw University of Technology (Poland)
- 9 Photonics Co-operation with Advanced and Electronic Systems: EMI, Radio, Radar Technologies
Krzysztof S. Kulpa, Warsaw University of Technology (Poland)
- 10 WILGA 2010 SPIE The Best Student Paper Presentation Award
Ryszard Kossowski, Warsaw University of Technology (Poland)
Krzysztof T. Poźniak, Warsaw University of Technology (Poland)
Maciej Linczuk, Warsaw University of Technology (Poland)
Ryszard S. Romaniuk, Warsaw University of Technology (Poland)

Introduction

WILGA 2010

Photonics Applications in Astronomy, Communications, Industry and High Energy Physics Experiments 2010

The **SPIE-IEEE-PSP WILGA** symposium [wilga.ise.pw.edu.pl] is an international Forum of Young Science in Photonics, Advanced Electronics and Internet Engineering. It is organized twice a year under the eminent patronage of two big international engineering institutions, SPIE [www.spie.org] and IEEE [www.ieee.org], and their Polish Counterparts: PSP - Photonics Society of Poland [www.photonics.pl], successor of Polish Chapter of SPIE [www.spie.pl] and IEEE Poland Section [www.ieee.pl], with participation of IEEE R8 [ewh.ieee.org/reg/8/sac/cms]. The patrons of the symposium are: PAS – Polish Academy of Science (The Committee on Electronics and Telecommunication) [keit.pan.pl], Association of Polish Electrical Engineers (SEP) [www.sep.com.pl], Polish Committee of Optoelectronics SEP [pkopto.ise.pw.edu.pl], Warsaw University of Technology [www.pw.edu.pl], and Institute of Electronic Systems [www.ise.pw.edu.pl].

WILGA Organizers

The symposium is organized by a group of devoted young photonics, mechatronics and electronics researchers, gathered in the PERG/ELHEP Research Group [[Zespół Badawczy PERG](http://Zespół%20Badawczy%20PERG)] of the Institute of Electronic Systems at the Faculty of Electronics and Information Technology of WUT. Most of these young researchers are active members of PSP, SEP, SPIE and IEEE. The symposium is diligently done by young researchers for young fellow researchers, and the main aim is to have a lot of fun and to learn a lot.

WILGA Publications

WILGA symposium publishes its papers in the following proceedings series, technical, and peer-reviewed journals:

- *Proceedings of SPIE*, since 2002
- *IEEE eXplore*, Internet publication database
- *Photonics Letters of Poland*, since 2009,
- *Elektronika*, SEP Journal, since 1998
- *JET - Intl. Journal of Electronics and Telecommunications*, PAS.

WILGA Proceedings of SPIE

There has been now quite a long tradition of WILGA publishing its works in the world-wide *Proceedings of SPIE* series. This volume of Proc. SPIE is the 10th published with WILGA papers. All of the WILGA-SPIE volumes contain more than 900 papers. It is not excluded that WILGA 2011 Proc. SPIE will cross over the 1000th paper. All WILGA Symposia have together published more than 2000 papers with around 4000 participants. This is an extraordinary achievement for a modest

symposium oriented solely on young researchers, and no other event of similar character could compare to this achievement. This success was only possible due to big involvement of young researchers in their work. The following WILGA SPIE Proceedings were published:

- Wilga 2002 – Proc. SPIE 5125
- Wilga 2003 – Proc. SPIE 5484
- Wilga 2004 – Proc. SPIE 5775
- Wilga 2005 bis – Proc. SPIE 5948 (Warsaw SPIE COO'05)
- Wilga 2005 – Proc. SPIE 6159
- Wilga 2006 – Proc. SPIE 6347
- Wilga 2007 – Proc. SPIE 6937
- Wilga 2008 – Proc. SPIE 7124
- Wilga 2009 – Proc. SPIE 7502
- Wilga 2010 – Proc. SPIE 7745

SPIE Poland 2005

The SPIE Poland meetings in 2005 were very special because then the Polish Chapter of SPIE (predecessor of Photonics Society of Poland), together with SPIE and some other regional SPIE Chapters, hosted the SPIE Warsaw Congress on Optics and Optoelectronics, SPIE COO Warsaw 2005. WILGA 2005 Symposium was split to two parts, one held usually in WILGA and the second jointly with the COO'05.

WILGA Ways and Topics

Official language of the symposium is English. Peer-reviewed papers are published in a renowned, internationally recognized *Proceedings of SPIE* series in USA. Symposium is designed mainly for Ph.D., M.Sc., and B.Sc. students (from physics, electronics and mechatronics, as well as material research) and their tutors/mentors. WILGA has a number of main topical tracks. Historically, the first one was Photonics and Web Engineering. Generally, WILGA embraces advanced photonic, mechatronic and electronic systems in the following aspects: theory, modeling, algorithms, simulations, emulations, design, hardware, software, hardware-software interaction and integration, measurements, testing, commissioning and exploitation. WILGA also addresses new research tendencies like 3D photonics and electronics design, micro and nano-systems, and material engineering including meta-materials. Topical sessions are organized by leading experts, and the sessions usually begin with current tutorials and are filled with contributed papers by students and young researchers. One of the most important session tracks in WILGA is the photonics applications and systems for superconductive accelerator (and free electron laser) technology and high energy physics experiments. We warmly invite students, young researchers and their tutors to participate in WILGA.

26th WILGA

WILGA 2010 January edition was held 29-30 January at WUT's FE&IT. WILGA 2010 May edition was held 24-29 May in a resort owned by Warsaw University of Technology. Nearly 200 presentations were delivered during both editions of WILGA, covering a broad area of photonics applications and web engineering, with nearly 250 participants. An exceptionally efficient chair of the Organization Committee of WILGA 2010 was Dr. Maciek Linczuk [M.Linczuk@elka.pw.edu.pl]. The working research sessions of the 26th WILGA 2010 included photonics, photonic and refractive optical fibers, optoelectronics, applications of optical fibers, integration of electronics, photonics and mechatronics, distributed measurement systems, LHC and CMS at CERN, optics and optoelectronics for astronomy, fundamentals of FPGA-DSP systems, object oriented design of hardware, terabit optical data links, software hardware co-design, biomedical engineering, computational intelligence of advanced systems, etc.

WILGA 2010 – SPIE-PSP Award for the Best Student Paper Presentation

WILGA 2010 Award Committee, managed skillfully by Dr. Ryszard Kossowski of WUT [kossowski@ia.pw.edu.pl], decided to split the presentations to two categories: Ph.D. students and M.Sc (including B.Sc.) students. The winners of SPIE-PSP WILGA 2010 competitions are:

Ph.D. category: 1 – Grzegorz Kasprowicz, ISE PW
2 – Piotr Makowski – Faculty of Physics PW
3 – ex aequo Katarzyna Ławniczuk, TPSA and IMIO PW;
Konrad Futera, ITR Institute and Mechatronics PW.

M.Sc. and B.Sc. category: 1 – Piotr Obroślak, ISE PW
2 – Piotr Florczyk, IMIO PW
3 – Anna Manerowska ISE PW
4 – Piotr Więckowski, ISE PW
5 – Agnieszka Zagoździńska, ISE PW.

WILGA Offspring

WILGA Symposium gave birth to a few topical meetings and conferences which then struck out on their own. These include regional student meetings (Opole, Wrocław, Kielce, Białystok, Lublin, Toruń and other), of SPIE student chapters, IEEE student branches, but also standalone conferences. Some of these meetings are still held periodically with WILGA, while some of them gained complete independence. WILGA is very proud of this sort of relationship, since it proliferates the very good idea of WILGA elsewhere. One of such meetings is now fully independent SPS – Signal Processing Symposium which started at WILGA in 2003. In 2003, the 12th IEEE-SPIE WILGA Symposium on Advanced Photonics and Electronics was organized and for the first time, and Dr. K. Kulpa chaired the Digital Signal Processing and Radar Signal Processing Sessions. In 2005 and 2007, the students from The Radiolocation and Digital Signal Processing Students' Research Group and Dr. Kulpa decided to organize the consecutive second and third editions of the Signal Processing Symposium, which was a part IEEE-SPIE

Symposium on Photonics, Electronics and Web Engineering, SPS 2005 and SPS 2007 gathered more than 100 participants and were assessed as very successful events, which led the Radar Group of ISE to organize for the fourth time Signal Processing Symposium SPS 2009 together with WILGA. The main goal of the symposium was to create a forum for students and scientists to present their latest research results, new trends in science and technology, and exchange ideas during technical and evening sessions. The sixth SPS meeting was a part of the 24th SPIE-IEEE Symposium on Advanced Photonics and Electronics Systems and Web Engineering. The SPS 2009 conference was organized by the Institute of Electronic Systems, Warsaw University of Technology together with Industrial Institute of Telecommunications S.A., Military University of Technology, RADWAR S.A, Space Research Center of Polish Academy of Sciences, Foundation for Development of Radio communication and Multimedia Technologies, IEEE Signal Processing Society Poland Chapter, and IEEE AESS Poland Chapter. The next SPS meeting is scheduled to be organized jointly with WILGA in 2011.

SPIE – PSP WILGA 2011

The organizers of WILGA 2011 Symposium, to be held 23–29 May, warmly invite interested students to participate in this exceptional and very friendly research event oriented to host young researchers from Poland and all over Europe.

Professor Jan Rayss and Doctor Jan Wójcik, UMCS Lublin (Poland)

This Volume is dedicated to the memory of Professor Jan Rayss, and Doctor Jan Wójcik, Chairs of Optical Fibre Technology Laboratory, Faculty of Chemistry, at Maria Curie – Skłodowska University in Lublin, internationally renowned key figures in optical fibre technology in Poland. Prof. J. Rayss passed away on 24 May 2010 after a long fight with cancer. We obtained this sad news during the WILGA 2010 Symposium. Dr Jan Wójcik passed away after a long and hard illness two months later on 26 July 2010.

Professor Jan Rayss and Dr. Jan Wójcik were very active founding members of SPIE Poland Chapter and its follower organization the Photonics Society of Poland. They organized the Krasnobród edition of Optical Fibres and Their Applications Conference, interleaved with Białowieża edition every year and a half. Many volumes of Proc. SPIE were generated from these conferences under their guidance. During the 2005 SPIE Congress on Optics and Optoelectronics in Warsaw, Prof. J. Rayss was a Chair of Optical Fibre Technology Conference. The volume from SPIE Warsaw COO'2005 (Proc. SPIE 5951) was edited by him in cooperation with Brian Culshaw and Anna G.Mignani. Dr Jan Wójcik, together with Prof. Waldemar Wójcik of Lublin University of Technology, was an editor of several volumes of Proc. SPIE from these conference series, published under the title *Lightguides and Their Applications* (Proc. SPIE 3189, 4239, 5576, 6608). Optical Fibre Technology Conference, which was a crown meeting of Prof. J. Rayss and Dr. J. Wójcik, produced also a number of books in the UMCS series of research works. Optical fiber Ph.D. students from UMCS, most of them young handsome lady chemists, used to participate in WILGA Symposium, contributing with Prof. J. Rayss and Dr. J. Wójcik to the development of optical fibre technology and

chemistry. They authored and co-authored scores of papers in Proc. SPIE. They participated in a few EU Projects on Optical Fibre Technology, including NEMO. Prof. J. Rayss was also a vice-rector of the UMCS, while Dr. J. Wójcik was a Head of Optical Fiber Technology Laboratory. They will be sorely missed by all of us, members of the national research, academia, and industrial community of optical fibre technology, optoelectronics, and photonics.

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