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Ryszard S. Romaniuk
Krzysztof S. Kulpa
Editors

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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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