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Editors

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Introduction

Wilga Symposium used to be a multidisciplinary and multi-conference meeting of young scientists and engineers. Wilga meetings and workshops aimed primarily at Ph.D. students and freshly graduated researchers. It was organized since 1995 two times a year, featuring winter and spring/summer editions. Since 2002 Wilga papers are published in the Proceedings of SPIE. The major topical track of Wilga used to be Photonics Applications. This track was extended to related fields and embraced coupling of photonics to other subjects like mechatronics, optoelectronics, laser technologies, electronics, communications, image processing, and information technologies.

Due to this coupling more complex and bigger systems were considered with core solutions containing photonics. Wilga meetings were also related with other optical, optoelectronic, and photonic conferences organized locally but of international extent. These conferences were Optical Fibers and Their Applications, with papers published in Proceedings of SPIE since 1986, and Laser Technology with papers published in Proceedings of SPIE since 1987.

The WILGA winter and summer meetings on Photonics Applications were initiated by the PERG-ELHEP Research Laboratory at the Institute of Electronic Systems of Warsaw University of Technology, Poland in 1995. The meetings started to be numbered with the winter edition of 1998, thus this year the summer edition 2024 was the 52nd jubilee. The Photonics Engineering Research Group joined forces with the Electronics Laboratory for High Energy Physics Experiments Laboratory at IES WUT to start organizing international research meetings on the integration of photonics, electronics, and mechatronics in demanding advanced applications. To start a new series of conferences is not always easy. In this particular case, the factors that strongly supported the beginning process for these meetings had domestic and international cooperation with young research teams, friendly cooperation with key research organizations, international support from SPIE and IEEE, and domestic support from the Association of Polish Electrical Engineers.

The essential factor was involvement of the initiating laboratory as well as international cooperation from laboratories like Deutsches Elektronen Synchrotron DESY in Hamburg, Germany; CERN in Geneve, Switzerland; Fermilab near Chicago, USA; and later with TJNAF in Newport News, USA; ITER in Cadarache, France; FAIR/GSI in Darmstadt, Germany; etc. Since 2002 SPIE – The International Society for Optics and Photonics generously agreed to support the WILGA Symposium and publish the proceedings of these young researchers' meetings in the Proceedings of SPIE. The volumes were published annually from joint winter and summer editions of WILGA Symposium under the common title Photonics Applications in Astronomy, Communications, Industry, and High Energy Physics Experiments.

For a number of years, SPIE has generously funded awards for the best student presentation in WILGA. WILGA, the Photonics Applications Symposium, was held at a small village resort owned by Warsaw University of Technology, Poland and is located 50 kilometres up the Vistula River from Warsaw. During the 25 years of numbered editions of the WILGA Symposium on Photonics Application, the meetings gathered more than 6000 young researchers, among them the majority of Ph.D. students active in Photonics, who published more than 2000 papers in Proceedings of SPIE, and 1000 papers elsewhere.

Since 2022 Wilga Symposium was intentionally moved to Lublin, with the major organizers residing in the Lublin University of Technology. The WILGA 2021, 2022, and 2024 Symposia on Photonic Applications gathered, partly via virtual links, a significant number of scholars from Ukraine who submitted content for publication which is also reflected in this volume of Proceedings. Some of Ukrainian scholars were able to come personally to Lublin which is a beautiful academic city located in eastern part of Poland not far away from the Ukrainian border.

The topical areas of these recent Wilga meeting were divided to three main sections: biomedical applications; materials, metrology, and image processing; components, communications, and ICT for photonics. These areas were discussed with participants to promote cooperation with Ukrainian research institutions and individual researchers. The editors would like to thank all Wilga Symposium participants, who made also this SPIE volume of proceedings possible.

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