

PREFACE

The 6th Conference of the Polish Society on Relativity (POTOR-6) was organized by the Szczecin Cosmology Group on behalf of the Polish Society on Relativity.

In the latest years, this series of events has become a regular annual meeting for the Polish scientists active in the field of gravity and related topics, including cosmology, given that the conferences are open to international invited speakers and participants.

It was a great honor for the Szczecin Cosmology Group to be the host of the 2019 event, due to the prestige of the Polish Society on Relativity, and because it sounded like a further recognition to the efforts put by its members to make Szczecin an important node of the scientific studies in relativity and cosmology in Poland.

The Szczecin Cosmology Group was initially established at the University of Szczecin in the early 1990s because of the initiative of Prof. Mariusz P. Dąbrowski with the support of late Prof. Jerzy Stelmach and now emeritus Prof. Janusz Garecki. Since then, it has grown up till the present team, made of three permanent members (in addition to Prof. Dabrowski, two recently appointed Associate Professors, Adam Balcerzak and Vincenzo Salzano), one senior member (Dr. Tomasz Denkiewicz), and five on-going Ph.D. students, from all over Europe, making it a very open and cosmopolitan team. Apart from a productive research activity finalized in a multiple series of scientific papers published in the most renowned journals, the group has also led the organization of several international conferences. In particular, the group has organized four topical COSMOFUN (COSMOlogy and FUNdamental interactions) events: COSMOFUN 2005 (Pomeranian Workshop in FUNdamental COSMOlogy), GRASSCOSMOFUN'09 (GRASSmanian Conference in FUNdamental COSMOlogy), MULTICOSMOFUN 2012 (MULTIverse and FUNdamental COSMOlogy), and VARCOSMOFUN'16 (VARying constants and FUNdamental COSMOlogy).

The POTOR-6 conference has covered all aspects of classical relativity as well as related fields including contemporary theories of unification and quantum gravity. A list of topics included: theoretical and numerical relativity; black holes: classical and quantum aspects; relativistic cosmology; early universe, dark matter, and dark energy problems; gravitational waves; approaches to quantum gravity; quantum cosmology; relation of relativity and superstring theory. This provided the conference was able to cover a diverse area of topics which were rooted in relativity.

The meeting was attended by about 80 people, and among them, as invited plenary speakers, some of the most eminent scientists in their respective fields. As a selection: Prof. Jorge Pullin, among the top experts in loop quantum gravity; Prof. Hermann Nicolai, Director of the Max Planck Institute for Gravitational Physics in Potsdam, Germany, known for his works on supergravity; Prof. Tsvi Piran, with his contribution to numerical relativity in connection with black holes and related gravitational waves production; Prof. Masaru Shibata, Director at Max Planck Institute for Gravitational Physics and Head of the division “Computational Relativistic Astrophysics”.

The proceeding volume is organized into topics, following the daily programme of the conference. Thus, the reader will find, in this order: “Classical Relativity, Compact Objects, Gravitational Waves” (introduced by contributions from Prof. Massimo Tinto and Prof. Tsvi Piran, plenary speakers); “Quantum gravity, Quantum Field Theory and Related Topics” (introduced by a plenary speaker, Prof. Joseph Conlon); “Testing Relativity, Astrophysics”; “Strings, Branes, Holography”; “Extended Gravity” (introduced by a plenary speaker, Prof. Salvatore Capozziello); “Cosmology”.

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