

## PREFACE

The aim of the 28<sup>th</sup> Cracow Epiphany Conference was to review recent advances in astroparticle physics. The conference was organised by the Henryk Niewodniczański Institute of Nuclear Physics, Polish Academy of Sciences. Although we initially planned for an in-person meeting, due to persisting Covid-19 pandemic the conference was held fully on-line on 10–14 January 2022. It hosted 123 participants.

The main focus of the conference was on high-energy cosmic ray particles and radiation, as well as their sources. Reviews and recent results of direct cosmic ray measurements, and multi-wavelength and multi-messenger observations of astrophysical sources of high-energy particles and radiation were presented. The meeting also included reports on novel advancements in theory and modeling of particle acceleration processes, testing cosmic ray acceleration in plasma physics laboratory experiments, dark matter searches, and related results in high-energy particle physics. These topics were covered in 48 invited review talks, 19 contributed presentations, and 29 presentations given by early-career scientists.

The present proceedings volume covers most aspects discussed at the conference, *i.e.*:

- High-energy cosmic ray measurements.
- Gamma-ray and multi-wavelength astronomy.
- Cosmic particle acceleration and transport.
- Astrophysical neutrinos.
- Dark matter searches.
- High-energy particle physics.

The electronic materials from the conference are also available at:

<https://indico.cern.ch/event/1034990/>

We thank the members of the Scientific Organizing Committee for their help in setting up the conference program. We also thank the directorate and administration of the Henryk Niewodniczański Institute of Nuclear Physics, Polish Academy of Sciences for their assistance in organising the conference. Special thanks go to the staff members of the Division of Particle and Astroparticle Physics and the Department of Computer Networks. We also appreciate *Acta Physica Polonica B* for their help in preparing this proceedings volume.

Local Organizing Committee:

*Jacek Niemiec (chair)*

*Dariusz Góra*

*Tadeusz Lesiak*

*Andrzej Siódmok*

*Henryk Wilczyński*