

PREFACE

The 29th International Conference on Ultrarelativistic Nucleus–Nucleus Collisions: Quark Matter 2022 was organized in Kraków, Poland, on April 4–10, 2022. The conference venue was the Auditorium Maximum of the Jagiellonian University. The main institutional organizers and sponsors were: the Faculty of Physics, Astronomy and Applied Computer Science of the Jagiellonian University, the Institute of Nuclear Physics of the Polish Academy of Sciences, and the Faculty of Physics and Applied Computer Science of the AGH University of Science and Technology.

The very process of the conference organization was disturbed first by the Covid-19 pandemic and then by the outbreak of the war in Ukraine. This forced a hybrid organization. Altogether 935 participants attended the conference (378 in-person and 557 online). The participants represented: Europe — 54%, America — 28%, Asia — 18%, Africa — 0.2%.

Quark Matter is a well-established international conference devoted to studying the properties of nuclear matter under extreme conditions of very high temperature and baryon number density. In laboratory conditions, such matter is produced in ultrarelativistic nucleus–nucleus collisions. Quark Matter conference serves as a platform for exchanging ideas between theoreticians and experimentalists worldwide.

The conference offered an opportunity to present the newest experimental results from the leading world laboratories including CERN (Switzerland) and Brookhaven National Laboratory (USA). In parallel, theoretical talks were given that offered explanations and interpretations of the properties of the analyzed new state of matter. The keynote talk was given by Frank Wilczek, the Nobel Prize Winner in 2004.

The conference participants were involved in intense scientific discussions of essential problems regarding the properties of matter under extreme conditions and of its fundamental theory, *i.e.*, Quantum Chromodynamics. This year several results referred also to the electromagnetic interactions governed by Quantum Electrodynamics. The first conference day was the Students' Day with a series of introductory lectures given by the world experts in the field. It was concluded with a lecture on quantum technologies given by Artur Konrad Ekert. In total, 197 presentations were given in plenary and parallel sessions. The poster session was organized in the online format, during which about 500 posters were presented with the full possibility of their individual presentation and discussion with all interested parties. Ten winners of the poster competition received a financial prize and had a chance to give flash talks at the last day of the conference.

During the last conference day the Zimanyi Medal was awarded to Sören Schlichting. The conference ended with a presentation of the next Quark Matter conference, which will be held in Houston, Texas, USA, September 3–9, 2023.

We acknowledge the Members of the International Advisory Committee for their valuable advice in shaping the conference scientific program. We are also grateful to the Members of the Local Organizing Committee for assistance in all aspects of organizational work. The efficient conduct of the event was possible thanks to the assistance of the Symposium Cracoviense company.

We acknowledge the support of the following institutions which made the participation of young scientists in Quark Matter 2022 possible: Nuclear Physics European Collaboration Committee (NUPECC), CERN, GSI Helmholtzzentrum fuer Schwerionenforschung GmbH, ExtreMe Matter Institute EMMI, Polish Academy of Sciences (PAN), Polish Academy of Arts and Sciences (PAU), National Centre for Nuclear Research (NCBJ), Jan Kochanowski University, University of Wrocław, University of Warsaw, Warsaw University of Technology, Polish Physical Society (PTF), CAEN S.p.A., and Kraków Convention Bureau.

Last but not least, we thank Professor Jacek Majchrowski, Mayor of the City of Kraków, for his Honorary Patronage of the conference.

The Editors

Wojciech Florkowski
Iwona Grabowska-Bołd
Krzysztof Kutak
Krzysztof Redlich
Barbara Wosiek

More information at:

<https://qm2022.symposium.pl/>,
<https://indico.cern.ch/event/895086/>