

Budapest and Gyöngyös, Hungary, November 30, 2023.

**Preface to the Proceedings of
52nd International Symposium on Multiparticle Dynamics (ISMD 2023)**



Between 21 and 26 August 2023, 129 physicists from 32 countries across 5 continents attended the 52nd International Symposium on Multiparticle Dynamics held on the Károly Róbert Campus of the Hungarian University of Agriculture and Life Sciences in Gyöngyös, Hungary. Over the one-week period, a total of 128 scientific reports were delivered at the international conference organised jointly by the Wigner Research Centre for Physics, Budapest, the Károly Róbert Campus of the Hungarian University of Agriculture and Life Sciences (MATE KRC, Gyöngyös), and the Eötvös Loránd University (ELTE, Budapest).

Numerous current research topics related to multiparticle dynamics were presented at ISMD 2023 in Hungary, including

- Collectivity in high energy collisions: jets and flows
- Cosmic ray and astroparticle physics
- Femtoscopy
- Forward physics: Diffraction, odderon and pomeron
- Hadronic final states in high p_T interactions
- Multiparticle correlations and fluctuations
- Proton structure, small-x and large-x physics
- Physics of X17 and other beyond standard model states
- Other important new developments in HEP
- Science outreach in Tokaj, Hungary.

Three out of the above ISMD 2023 topics attracted particularly large interest. **The greatest international interest was generated by the latest research results concerning the subatomic particle candidate known as X17, which had been discovered at the Hungarian Research Network Institute for Nuclear Research (ATOMKI) located in Debrecen, Hungary.**

The nearly perfect fluid behavior, observed experimentally in high energy collisions of elementary proton-proton and heavy ion collisions has drawn also great attention, even excursion time has been shortened to allow time for presenting the new experimental and theoretical results in this section. MDPI Universe sponsored the best young speaker and best poster prizes of ISMD 2023 and both winners selected were presenting results related to this topic of collectivity in small and large colliding systems at high energies. **Ms. Archita Rani Dash Ph.D.** (University of Münster, Münster, Germany) has been selected as **the best junior speaker of ISMD 2023** by the vote of the International Advisory Committee and the Board of Elders for her talk entitled „Recent Jet Measurements in Pb-Pb Collisions with ALICE”. Similarly, **Mr. Dániel Kincses, Ph.D.** (Eötvös University, Budapest, Hungary) has been selected as **the best poster speaker of ISMD 2023**, for his flash/poster talk entitled „Pion interferometry with Lévy stable sources in $\sqrt{s_{NN}} = 200$ GeV Au+Au collisions at STAR”.

The third highlighted topic of ISMD 2023 was related to the solution of a 50 years old particle physics puzzle, the statistically significant experimental observation of odderon exchange, predicted theoretically by B. Niclescu and L. Lukaszuk in 1973.

In addition to the intensive professional work, the participants of ISMD2023 got an insight to the rich natural beauty, cultural and gastronomic values of Gyöngyös and the Mátra hills, as well as the Eger and Tokaj wine regions of Hungary.

ISMD 2023 was closed with a science outreach section, where secondary school students from Croatia, Hungary, Mexico, Poland and The Netherlands participated online.

All the ISMD 2023 presentations are archived at

<https://indico.cern.ch/e/ismd23> .

The organization of ISMD 2023 would have been nearly impossible without the support of **several civil, local and international sponsors.** We would like to express our gratitude [to all the ISMD 2023 sponsors](#) for their invaluable support and generosity.

Sponsors of 52nd International Symposium on Multiparticle Dynamics (ISMD 2023) included

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As mentioned in the ISMD 2023 opening talk of the Chair of ISMD 2023, the allegory for the Hungarian Academy of Sciences is a painting by J. Ender, entitled *“From Darkness, The Light”*. [This painting](#) is also the symbol of that Institution and the main motif constituting its logo. The central figure on this painting is a young goddess with a laurel wreath on her head. In her right hand she is holding up a golden cup, her other hand is resting on a large shield. The goddess is surrounded by a dark landscape, and the sky above this landscape is filled with dark clouds. At the same time, rays of sunlight are bursting through the gloom and shining on the beautiful goddess. Two eagles are also coming, and the first one is approaching the gold cup.

[This painting](#), as well as the organization of ISMD 2023 with a special emphasis on encouraging and supporting junior participants, inspired the Chair to write a poem as an allegory for ISMD 2023. The title of this poem is the same as that of the painting of J. Ender: *“From Darkness, The Light”*.

It is our pleasure to include this poem to this preface to the proceedings of ISMD 2023:

From Darkness

Don't come to talk,
Don't "prove" by a plot.
Don't measure
incalculable things.
Don't calculate
immeasurable things.
Don't discourage,
Don't clip students' wings.

Csörgő Tamás
2020. 12. 16. 2023. 09. 12.

The Light

**Do encourage students,
Give them wings.
Do calculate
Measurable things.
Do measure to
Clarify the fact.
Plot to highlight,
Come to interact.**

Finally, we would like to thank to all the speakers and participants of ISMD 2023, who came to this meeting, who delivered their talks and poster presentations, who participated in the inspiring discussions and in particular to those, who also managed to write-up their contributions to the conference proceedings.

Prof. Tamás Csörgő, MAE, Chair of ISMD 2023,
Prof. Máté Csanád, MYAE, Scientific Secretary and
Dr. Tamás Novák, Ph.D, Co-chair of ISMD 2023.