On 29-31 March, the Meshcheryakov Laboratory of Information Technologies hosted the international scientific conference “Parallel Computational Technologies (PCT) 2022”, the sixteenth in a series of annual conferences dedicated to the development and application of parallel computing technologies and machine learning in versatile areas of science and technology. The conference is organized by the Ministry of Science and Higher Education of the Russian Federation and the Supercomputer Consortium of Russian Universities.

More than 110 scientists from Belarus, Brazil, Egypt, Mongolia, Romania, Slovakia took part in the conference. Russia was represented by participants from 40 universities, research centers, IT and industrial companies. The conference was organized in nine sessions, where issues associated with the application of cloud, supercomputer and neural network technologies in science and technology, including applications, hardware and software, specific models, languages, libraries and packages, were discussed. 7 plenary, 38 sessional and 10 poster talks were delivered.

JINR Director, RAS Academician G.V. Trubnikov opened the conference with a report on the history of the Institute, its scientific program, present and future. He underlined that information technology is one of the dynamically developing areas of knowledge, which plays a cardinal role in the implementation of JINR’s ambitious program. MLIT Director V.V. Korenkov spoke in detail about the status and prospects for the development of the JINR computer complex, i.e. the Multifunctional Information and Computing Complex. He also highlighted that MLIT provided and would proceed to provide high-quality IT services and support to scientists participating in JINR’s projects both on the territory of Dubna and beyond.

The talk “Supercomputer technologies, artificial intelligence and Big Data” by V.V. Voevodin (RCC MSU), a leading Russian specialist in computer technology, high-performance computing and parallel programming, evoked great interest among the audience. The 36th edition of Top50 of the CIS’s most powerful computers (http://top50.supercomputers.ru/list) was announced during the report.

At the conference, there were plenary talks on mathematical modeling using supercomputer and parallel technologies, in particular, K.A. Barkalov (Lobachevsky University, UNN) spoke about the kinetic modeling of the reaction of isobutane alkylation with mixed olefins and sulfuric acid using the asynchronous global optimization algorithm. A.E. Chistyakov (DSTU) in his report presented methods and algorithms for the predictive modeling of the consequences of natural and man-made disasters in shallow waters, such as the Sea of Azov, as well as for the prediction of the silting of shipping lanes. I.G. Chernykh (ICM&MG SB RAS) devoted his report to the supercomputer modeling of the carbon burning subgrid process in the problems of the evolution of white dwarfs and the explosion of type Ia supernovae or thermonuclear supernovae.

A number of talks at the conference were made by representatives of the IT industry, leading manufacturers and suppliers of hardware and software, who were sponsors of the conference. Among them were Karma Group and RSC Group. Their reports provided an IT development analysis and presented trends in the development of storage systems, computer communications, novel computing architectures, as well as touched upon the issues of the design of large-scale computing centers. The Special Technological Center was also the conference partner, and information support was provided by the PARALLEL.RU Center, the “Poisk” newspaper and the “CAD/CAM/CAE Observer” journal.

A separate session was dedicated to the integrated supercomputer infrastructure (ISI). In September last year, JINR, the Interdepartmental Supercomputer Center of the RAS and Peter the Great St. Petersburg Polytechnic University signed an agreement on the integration of their

supercomputers into a unified scalable research infrastructure based on the National Research Computer Network of Russia. During the session, there were delivered talks on modern IT solutions for providing shared-use centers, on the implementation of the ISI on the “Govorun” supercomputer of JINR, on the experience of using the ISI for event generation and reconstruction within the MPD experiment. The session ended with a tour of the Multifunctional Information and Computing Complex of MLIT JINR.

A competition of reports by young scientists under the age of 30 was organized within the conference with the financial support of Karma Group. At the first stage, the program committee of the conference selected the best articles from those submitted to the competition. At the second stage, young scientists presented their works at the youth session of the conference. During this session, the jury chose the winners of the competition, who were awarded diplomas and cash bonuses.

On working days of the conference, there was organized a supercomputer exhibition, where RSC Group and Karma Group presented their latest developments in the field of high-performance computing.

The participants of the conference were impressed by a bus sightseeing tour of Dubna, during which they visited the town’s significant places, and by an excursion to the interactive exposition “JINR Basic Facilities” in the “Mir” Cultural Center, where they were able to see the models of JINR’s basic facilities and learn the principles of their operation.

At the closing of the conference, words of gratitude were expressed to the organizing committee for the high level of holding the conference.

The presentations of the talks and photos are available at the conference website http://agora.guru.ru/pavt2022/. Selected proceedings of the conference will be published in Springer’s Communications in Computer and Information Science series and in the Computational Mathematics and Software Engineering series of the Bulletin of South Ural State University.

The next PCT’2023 conference will take place at ITMO University, Saint Petersburg.