

**The 9th International Conference
"Distributed Computing and Grid Technologies in Science
and Education"**

05-09 July 2021, Dubna, Russia

Monday, 05 July, 2021, MLIT Conference Hall

9.00-10.00	Registration at the MLIT Conference Hall
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Plenary

10.00-10.30	Opening session
10.30-11.10	JINR's strategic plan for long-term development Grigory Trubnikov (online)
11.10-11.30	Coffee
11.30-12.00	Information Technologies @ JINR development strategy Vladimir Korenkov
12.00-12.30	Филиал МГУ в г.Сарове - новый элемент суперкомпьютерного образования в России Vladimir Voevodin (online)
12.30-13.30	Lunch
13.30-14.15	System programming and cybersecurity Arutyun Avetisyan
14.15-15.00	Distributed scientific computing challenges and outlook Oxana Smirnova (online)
15.00-15.30	Coffee

17.00-18.30	Welcome Party
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Computing for MegaScience Projects Room 310

15.30-15.45	The ATLAS EventIndex using the HBase/Phoenix storage solution Elizaveta Cherepanova
15.45-16.00	Performance testing framework for the ATLAS EventIndex Elizaveta Cherepanova
16.00-16.15	Development of the ATLAS Event Picking Server Evgeny Alexandrov
16.15-16.30	Computing environment for the Super-Charm-Tau factory detector project Dmitriy Maximov
16.30-16.45	Simulation Model of an HPC System for Super Charm-Tau Factory Dmitry Wiens
16.45-17.00	Participation of Russian institutes in the processing and storage of ALICE data Andrey Zarochentsev

Big data Analytics and Machine learning Room - 407

15.30-15.45	Can I protect my face image from recognition? Nadezhda Shchegoleva (online)
15.45-16.00	On methods of the transfer learning in the classification of the biomedical images Eugene Shchetin (online)
16.00-16.15	Deep Learning Application for Image Enhancement Ahmed Elaraby (online)
16.15-16.30	Architecture of a generative adversarial network and preparation of input data for modeling gamma event images for the TAIGA-IACT experiment Yulia Dubenskaya (online)
16.30-16.45	The use of convolutional neural networks for processing stereoscopic IACT images in the TAIGA experiment Stanislav Polyakov (online)
16.45-17.00	Machine Learning for Data QuaMLITy Monitoring at CMS Experiment Ilya Gorbunov (online)

Distributed computing systems Conference Hall

15.30-15.45	IHEP tier-2 computing center: status and operation Viktor Kotliar (online)
15.45-16.00	INP BSU grid site Dmitry Yermak (online)
16.00-16.15	Research Cloud Computing Ecosystem in Armenia Artashes Mirzoyan (online)
16.15-16.30	COMPASS production system: Frontera experience Artem Petrosyan
16.30-16.45	Concurrently employing resources of several supercomputers with ParaSCIP solver by Everest platform Sergey Smirnov (online)
16.45-17.00	Опыт организации гибкого доступа к удаленным вычислительным ресурсам из среды JupyterLab с использованием технологий проектов Everest и Templet Sergey Vostokin (online)

Distributed computing applications Room 403

15.30-15.45	Программный интерфейс для функционального программирования для параллельных и распределенных систем Ivan Petriakov (online)
15.45-16.00	An intelligent environmental monitoring platform Alexander Uzhinskiy
16.00-16.15	The technology and Tools for the Building of Information Exchange Package Based on Semantic Domain Model Elena Yasinovskaya
16.15-16.30	Development of dashboards for the workflow management system in the ATLAS experiment Aleksandr Alekseev (online)
16.30-16.45	Lifecycle Management Service for the compute nodes of Tier1, Tier2 sites (JINR) Alexandr Baranov
16.45-17.00	WALT Platform for Web Application Development Ivan Sokolov

Tuesday 06 July, 2021, MLIT Conference Hall

Plenary

9.00-9.40	Evolution of the WLCG computing infrastructure for the High Luminosity challenge of the LHC at CERN Simone Campana (online)
9.40-10.10	Perspective and Strategy of IT Development at IHEP Qiulan Huang (online)
10.10-10.30	Coffee
10.30-11.15	Status of the DIRAC Interware Project Andrei Tsaregorodtsev (online)
11.15-12.00	dCache: Inter-disciplinary storage system Tigran Mkrтчyan (online)
12.00-12.20	Disaggregated infrastructure: future trend and current implementation in MMLIT JINR Govorun system. Alexander Moskovsky
12.20-12.40	Intel architecture, technology and products for HPC and GRID. How to create the most effective system. Nikolay Mester
12.40-13.30	Lunch

Computing for MegaScience Projects Conference Hall

13.30-13.45	Visualization of Experimental Data in Web-based Virtual ReaMLITy Štefan Korečko, Martin Vala, Martin Fekete (online)
13.45-14.00	Design and development of application software for MPD distributed computing infrastructure Igor Pelevanyuk
14.00-14.15	Web based Event Display server for MPD/NICA experiment Alexander Krylov
14.15-14.30	Performance Analysis and Optimization of MPDroot Slavomir Hnatic
14.30-14.45	Многопоточный режим моделирования событий в пакете BmnRoot Margarita Stepanova (online)
15.00-15.20	Coffee
15.20-15.35	Missing Mass Method for reconstruction of short-lived particles in the CBM and STAR experiments Pavel Kisel (online)
15.35-15.50	Neural Networks in Modeling Beam Dynamics using Taylor Mapping Nataliia Kulabukhova (online)
15.50-16.05	Grammar parser-based solution for the description of the computational graph within GNA framework Nikita Tsegelnik (online)
16.05-16.20	Improvements of the LOOT model for primary vertex finding based on the analysis of development results Ekaterina Rezvaya (online)
16.20-16.35	TrackNETv3 with optimized inference for BM@N tracking Anastasiia Nikolskaia (online)

Distributed computing, HPC and ML for solving applied tasks
Room 403

13.30-13.45	Concept of peer-to-peer caching database for transaction history storage as an alternative to blockchain in digital economy Mikhail Belov
13.45-14.00	Direct computational experiment in storm hydrodynamics of marine objects Alexander Degtyarev, Ivan Gankevich
14.00-14.15	Development of a tool for interactive detailing of areas of objects for the strength modeling system Egor Budlov
14.15-14.30	Detection of fertile soils based on satelMLITe imagery processing Valery Grishkin (online)
14.30-14.45	Potential of Neural Networks for Air QuaMLITy Sensor Data Processing and Analysis Jan Bitta
14.45-15.00	Air Pollution Modelling Using Spatial Analysis and Neural Networks Vladislav Svozilik
15.00-15.20	Coffee
15.20-15.35	Efficient gossip-based protocol in the Neo blockchain network Anna Shaleva (online)
15.35-15.50	Comparative analysis and applicabiMLITy determination for several DLT solutions Anar Faradzhov (online)
15.50-16.05	Deep learning for automatic RF-modulation classification M. Dima (online)
16.05-16.20	NARX neuromorphic software in ECG wave prediction T. Dima (online)
16.20-16.35	Explanation of NMR mobiMLITy of peptide dendrimers using distributed computing Oleg Shavykin
16.35-16.50	Fractal thermodynamics, big data and its 3D visualization Victor Tsvetkov
16.50-17.05	Extraction of traffic features in Software Defined Networks using an SDN Controller Sergey Volkov (online)
17.05-17.20	Разработка и исследование распределенных алгоритмов управления системами роевого интеллекта Артем Горемыкин
17.20-17.35	Применение методов машинного обучения для задачи распознавания русских дореволюционных печатных текстов Владислав Федоров
17.35-17.50	Statistical mechanics approach for deep-belief neural networks exploration R. Rudamenko (online)
17.50-18.05	IT for air quaMLITy management - mathematical modeling verified by special sampling and nuclear analytical methods and Air Pollution Management System (AQMS) Petr Jancik (online)
18.05-18.20	Optimization of the computation of the multidimensional integrals for estimation of the meson lifetime Daviti Goderidze

Quantum information processing
Room 310

13.30-13.45	Quantum control algorithm of imperfect knowledge bases of intelligent cognitive controllers Sergey Ulyanov
13.45-14.00	Quantum Machine Learning for HEP detectors simulations Florian Rehm (online)
14.00-14.15	Effective algorithm of calculating the wigner function for a quantum system with a polynomial potential Evgeny Perepelkin
14.15-14.30	Classical Fisher information for the state space of N-level systems through the Wigner function Vahagn Abgaryan
14.30-14.45	Describing quantumness of qubits and qutrits by Wigner function's negativity Astghik Torosyan
14.45-15.00	On the geometry of non-maximal strata qudit space with Bures metric Martin Bures
15.00-15.20	Coffee

Round table on IT technologies in education
Room 310

15.20-15.35	National Research and Education Network of Russia: directions of development in the context of expanding of international cooperation Alexey Abramov (online)
15.35-15.50	The concept of training IT professionals in cross-cutting digital technologies Evgenia Cheremisina
15.50-16.05	Обучение без учителя на данных узкой направленности агрегированных автоматически Ekaterina Pavlova
16.05-16.20	Using data from the labor market for analysis and education Irina Filozova
16.20-16.35	The analysis of the educational measurement results, and its providing as "software-as-a-service" solution in eLearning Julia Lavdina

**Big data Analytics and Machine learning.
Room 407**

13.30-13.45	Event index based correlation analysis for the JUNO experiment Tao Lin (online)
13.45-14.00	Mechanisms for identifying the patterns of the dynamics of scientific and technical publications on the example of the thematic direction "Robotics" Andrey Cherkasskiy
14.00-14.15	Data analysis platform for stream and batch data processing on hybrid computing resources Ivan Kadochnikov
14.15-14.30	Intelligent Networks: using convolutional LSTM models to estimate network traffic Joanna Waczynska (online)
14.30-14.45	Benchmark of Generative Adversarial Networks for Fast HEP Calorimeter Simulations Florian Rehm (online)
14.45-15.00	Identification of news text corpora influencing the volatility of financial instruments Alexey Stankus
15.00-15.20	Coffee
15.20-15.35	Classification of lung X-rays with pneumonia disease using deep learning models Eugene Shchetin (online)
15.35-15.50	Forecasting and assessment of land conditions using neural networks Anastasiia Khokhriakova, Valery Grishkin (online)
15.50-16.05	Using distributed computing systems to solve the problem of image classification using deep neural networks Ilya Kurochkin (online)
16.05-16.20	High resolution image processing and land cover classification for hydro-geomorphological high-risk area monitoring Giorgia Miniello (online)
16.20-16.35	SQL query execution optimization on Spark SQL Gleb Mozhaiskii

Wednesday 07 July, 2021, MLIT Conference Hall

Plenary

9.00-9.45	From Quantum Speed-up to Supremacy and Advantage Cristian Calude (online)
9.45-10.30	Alexey Fedorov
10.30-10.50	Coffee
10.50-11.30	Clustering in ontology-based exploratory analysis of scientific productivity Pawel Lula (online)
11.30-12.00	Серверы Dell EMC PowerEdge ЛОКОМОТИВ ИТ-ИННОВАЦИЙ Nikita Stepanov
12.00-12.30	Опыт и возможности Softline в обеспечении инфраструктуры для научных исследований Сергей Монин
12.30-13.00	Вычислительные технологии класса энтерпрайз Valery Yegorshev
13.00-13.20	Afternoon coffee
13.20-14.00	RDIG-M Vasiliy Velikhov

Conference Hall

14.00-16.00	RDIG round table
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Room 403

14.00-16.00	DataManagement for supercomputers round table
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16.00-20.00	Boat and Picnic Party
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Thursday 08 July, 2021, MLIT Conference Hall

Plenary

9.00-9.45	Current status of the MICC: an overview Tatiana Strizh
9.45-10.30	PIK Data Centre status Andrey Kiryanov
10.30-11.00	Coffee
11.00-11.45	Offline Software and Computing for the SPD experiment Alexey Zhemchugov
11.45-12.30	IT solutions for JINR tasks on the “Govorun” supercomputer Dmitry Podgainy
12.30-13.30	Lunch

Research infrastructure

Conference Hall

13.30-13.45	Advantages of overlay scientific networks creation on top of RETN core optical transport network Andrey Ul'yanov (online)
13.45-14.00	Система массовой памяти МИВК ОИЯИ. Статус, перспективы. Vladimir Trofimov
14.00-14.15	Usage of time series databases in the Grafana platform for the NETIS service Evgeny Alexandrov
14.15-14.30	Monitoring System for the Russian Scientific Data Lake Prototype Aleksandr Alekseev (online)
14.30-14.45	JINR CMS Tier-1, LCG2 accounting system Ivan Kashunin
14.45-15.00	Development of effective access to the distributed scientific and educational e-infrastructure Grigore Secrieru (online)
15.00-15.30	Coffee
15.30-15.45	Data Center Simulation for the BM@N experiment of the NICA Project Daria Priakhina
15.45-16.00	A virtual testbed for optimizing the performance of a new type of accelerators Alexander Degtyarev, Alexander Bogdanov, Maria Mingazova
16.00-16.15	New hardware testing methodology at IHEP data center Victoria Ezhova (online)
16.15-16.30	Modeling network data traffic for vulnerability scan using the TrafficREWIND test bench infrastructure of TIER1 data centers at JINR Andrey Baginyan
16.30-16.45	IPv6 dual-stack deployment for the distributed computing center Viktor Kotliar (online)
16.45-17.00	Services of computational neurobiology tasks, based on the distributed modular platform «Digital Laboratory» NRC «Kurchatov Institute» Irina Enyagina (online)
17.00-17.15	Precomputation formal verification of HPC cluster applications using SOPN Petri nets Oleg Iakushkin
17.15-17.30	Transformer-based Model for the Semantic Parsing of Error Messages in Distributed Computing Systems in High Energy Physics Dmitry Grin (online)

Distributed computing systems
Room – 310

13.30-13.45	Some Aspects of the Workflow Scheduling in the Computing Continuum Systems Vladislav Kashansky (online)
13.45-14.00	The JINR distributed information and computing environment: participants, features and challenges Nikolay Kutovski
14.00-14.15	Usage of JINR SSO authentication and authorization system with distributed data processing services. Andrey Iachmenev
14.15-14.30	Modeling the process of executing an evolutionary algorithm on the desktop grid Nikolay Khrapov (online)
14.30-14.45	Развитие и совершенствование способов оценки качества технических систем в процессе эксплуатации Камиль Закирович Билятдинов (online)
14.45-15.00	The graph diameter of a distributed system with a given dominant set Пяа Kurochkin (online)
15.00-15.30	Coffee
15.30-15.45	Jira plugin for ALICE instance Andrey Kondratyev (online)
15.45-16.00	Remote Procedure Call protocol with support for higher-order functions Fedor Bukreev (online)
16.00-16.15	Применение мультиагентных систем при обработке видеоданных Анатолий Каляев
16.15-16.30	Распределенные отказоустойчивые вычисления с SBN-Python на реальном кейсе компании Дмитрий Терещенко

**Data Management, Organization and Access
Room 407**

13.30-13.45	Russian data lake prototype as an approach towards national federated storage for Megascience. Andrey Kiryanov
13.45-14.00	Load balancing strategies in grid-systems Sergei A. Mamaev
14.00-14.15	Approach to remote participation in the iter experimental program. Experience from model of russian remote participation center Oleg Semenov
14.15-14.30	The algorithm for solving the problem of synthesis of the optimal logical structure of distributed data in architecture of grid service Elena Nurmatova (online)
14.30-14.45	The development of a new conditions database prototype for ATLAS RUN3 within the CREST project Mikhail Mineev
14.45-15.00	Development of the Condition Database for the experiments of the NICA complex Konstantin Gertsenberger
15.00-15.30	Coffee
15.30-15.45	Development of the Event Metadata System for the NICA experiments Peter Klimai (online)
15.45-16.00	Tape libraries as a part of JINR MICC mass storage system Алексей Голунов
16.00-16.15	Complete decentralization of distributed data storages based on blockchain technology Andrey Demichev (online)
16.15-16.30	Data Knowledge Base current status and operation Viktor Kotliar (online)

HPC
Room 403

13.30-13.45	Population annealing method and hybrid supercomputer architecture Lev Shchur (online)
13.45-14.00	Multi-GPU training and parallel CPU computing for the machine learning experiments using Ariadne library Egor Shchhavelev (online)
14.00-14.15	Implementing the Graph Model of the Spread of a Pandemic on GPUs Vladimir Sudakov (online)
14.15-14.30	Developing a Toolkit for Task Characteristics Prediction Based on Analysis of Queue's History of a Supercomputer Mahdi Rezaei (online)
14.30-14.45	Research of improving the performance of explicit numerical methods on the x86 and ARM CPU Vladislav Furgailo (online)
14.45-15.00	Analysis of the effectiveness of various methods for parallelizing data processing implemented in the ROOT package. Tatyana Solovjeva
15.00-15.30	Coffee
15.30-15.45	OpenMP computing of a reference solution for coupled Lorenz system on [0,400] Ivan Hristov (online)
15.45-16.00	Overlapping Computation and Communication in Matrix-Matrix Multiplication Algorithm for Multiple GPUs Yea Rem Choi, Vsevolod Nikolskiy, Vladimir Stegailov
16.00-16.15	Verifiable application-level checkpoint and restart framework for parallel computing Ivan Gankevich
16.15-16.30	Development of information systems for theoretical and applied tasks on the basis of the HybriLIT platform Yuri Butenko
16.30-16.45	Интеллектуальный анализ данных для повышения эффективности использования высокопроизводительной гетерогенной вычислительной платформы HybriLIT Ekaterina Polegaeva
16.45-17.00	The grid-characteristic method for applied dynamic problems Vasily Golubev (online)

Friday 09 July, 2021, MLIT Conference Hall

Plenary

09.00-09.45	Plenary report
09.45-10.30	Plenary report
10.30-11.00	Coffee
11.30-12.00	Information technologies based on DNA. Nanobioelectronics Victor Lakhno
12.00-12.30	Accounting and monitoring infrastructure for Distributed Computing in the ATLAS experiment Aleksandr Alekseev (online)
12.30-13.00	Plenary report
13.00-14.00	Lunch

15.30-16.30	CLOUSING
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Data Management, Organization and Access Conference Hall

14.00-14.15	Increasing the accuracy of the diagnosis of mental disorders based on heterogeneous distributed data Alexander Degtyarev, Alexander Bogdanov
14.15-14.30	Error detection in data storage systems and distributed voting protocols Alexei Uteshev (online)
14.30-14.45	Passwordless Authentication Using Magic Link Technology Iurii Matiushin
14.45-15.00	Risk model of application of lifting methods Aleksandr Dik (online)
15.00-15.15	Solving the problems of Byzantine generals using blockchain technology Jasur Kiyamov (online)

Virtualization Room – 310

14.00-14.15	Quantitative and qualitative changes in the JINR cloud infrastructure Nikolay Kutovskiy
14.15-14.30	The use of distributed clouds for scientific computing Igor Pelevanyuk
14.30-14.45	Минимизация образов корневых файловых систем Docker контейнеров Irina Nikolaeva
14.45-15.00	Resource Management in Private Multi-Service Cloud Environments Nikita Balashov
15.00-15.15	Evaluating Different Options for Scientific Computing in Public Clouds Oleg Sukhoroslov (online)
15.15-15.30	Применение новых технологий виртуализации в учебном процессе David Satsradze (online)

HPC
Room – 403

14.00-14.15	Features of HPC resources for HEP	Artem Petrosyan
14.15-14.30	Energy analysis of plasma physics algorithms	Igor Chernykh
14.30-14.45	VM based Evaluation of the Scalable Parallel Minimum Spanning Tree Algorithm for PGAS Model	Vahag Bejanyan (online)
14.45-15.00	Data storage systems of "HybriLIT" Heterogeneous computing platform for scientific research carried out in JINR: filesystems and RAIDs performance research	Aleksander Kokorev
15.00-15.15	HPC workload balancing algorithm for co-scheduling environments	Ruslan Kuchumov (online)
15.15-15.30	Characteristics of Nvidia CUDA and AMD ROCm Platforms Affecting Performance Portability	Vsevolod Nikolskiy

Big data Analytics and Machine learning.
Room – 407

14.00-14.15	Neural network approach to the problem of image segmentation for morphological studies at LRB JINR	Alexey Stadnik
14.15-14.30	Algorithms for behavioral analysis of laboratory animals in radiobiological research at LRB JINR	Alexey Stadnik
14.30-14.45	On deep learning for option pricing in local volatility models	Sergey Shorokhov (online)
14.45-15.00	Analytical platform for socio-economic studies	Sergey Belov
15.00-15.15	Применение методов машинного обучения для кросс-классификации алгоритмов и задач многомерной непрерывной оптимизации	Андрей Чепурнов
15.15-15.30	Multi-instance learning for Rhetoric Structure Parsing	Sergey Volkov (online)