Konstantin Viktorovich Gertsenberger



PhD in Computer Science · software systems for physics experiments

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Date of birth: 3 June 1983, Dubna · Marital status: married

SUMMARY

- Head of the Software Group of the Scientific Experimental Department of Nuclear Physics with Heavy Ions at the NICA complex, Laboratory of High Energy Physics (VBLHEP), JINR, and software coordinator of the BM@N experiment of the NICA megaproject. In software development since 2003 (23 years), 17 of them at JINR. The scientific work is devoted to software development, HPC and implementation of information systems for the experiments of the NICA (Nuclotron-based Ion Collider fAcility) complex.
- Scientific publications: 92; presentations at scientific events: 46 as speaker and 45 as co-author.

EDUCATION

- **05.11.2014:** PhD degree in computer science (“Mathematical and software support for computing machines, complexes and computer networks”), National Research Nuclear University MEPhI. The PhD thesis is “Methods and tools of the parallel software development for image and signal processing” (the software part in C#, WPF, MPI, OpenMP).
- **2006 – 2009:** Postgraduate student in “Mathematical and software support for computing machines, complexes and computer networks”, Department of Cybernetics, MEPhI (completed in April 2009).
- **2000 – 2006:** Specialist degree, system engineer in “Computing machines, complexes, systems and networks”, Department of Cybernetics, MEPhI, graduated with honors. The theme of the thesis is “Expanding the functionality of the IPPLabMSCo library for solving tasks of parallel image processing”. Special state scholarship of the Government of the Russian Federation (2004/2005).

JOINT INSTITUTE FOR NUCLEAR RESEARCH (SINCE 09.2009)

- **07.2019 – current:** Head of the Software Group No. 1, Scientific Experimental Department of Nuclear Physics with Heavy Ions at the NICA complex, VBLHEP. Development of software for the BM@N experiment of the NICA project.
- **02.2017 – 07.2019:** Senior researcher: MultiPurpose Detector (MPD) department; since 06.2017 the Department of Nuclear Physics with Heavy Ions at the NICA complex, VBLHEP.
- **05.2014 – 02.2017:** Researcher, sector No. 3 of the MultiPurpose Detector (MPD) department, VBLHEP.
- **09.2009 – 05.2014:** Junior researcher, MultiPurpose Detector (MPD) department, VBLHEP.

EXECUTIVE AND SCIENTIFIC MANAGEMENT

- **since 2019:** Software coordinator of the international collaboration of the BM@N experiment of the NICA project.
- **since 2019:** Member of the Executive Committee of the BM@N experiment.
- **since 2021:** Member of the Scientific and Technical Council, Laboratory of High Energy Physics, JINR.
- **since 2024:** Member of the coordination group on computing for the experiments at the NICA accelerator complex.
- **since 2020:** One of the scientific supervisors of the MIPT master's programme “Software development and application in physics research”.
- **2018:** Member of the scientific commission on the VBLHEP development strategy.

- **2019 – current:** Organization of the software sections of the BM@N collaboration meetings (from the 4th to the 15th); programme and organizing committee member of the collaboration meetings, the JINR Schools on Information Technologies (2024, 2025) and the conference “Elementary particle physics and cosmology 2021”.

SCIENTIFIC ACTIVITY

- **06.2017 – current:** JINR Scientific Experimental Department of Nuclear Physics with Heavy Ions at the NICA complex, VBLHEP: experimental and simulated data processing and visualization, software development, HPC and implementation of information systems for the BM@N experiment of the NICA project.
- **09.2009 – 06.2017:** JINR Scientific Experimental Department of MultiPurpose Detector, VBLHEP: experimental and simulated data processing and visualization, software development, HPC and implementation of information systems for the MPD experiment of the NICA collider.
- **09.2006 – 09.2009:** National Research Nuclear University MEPhI, laboratory “Robotics”: creating software computing complexes for parallel processing of multimedia information (RFBR grant).

PARTICIPATION IN RESEARCH GRANTS

- **2019 – 2022:** Head, RFBR grant No. 18-02-40125 “Development of Information Systems for online and offline data processing for the experimental setups of the NICA complex”.
- **2019 – 2021:** Executor, RFBR grant No. 18-02-40102 “Development and improvements of the methods and algorithms for simulation and reconstruction data obtained in the experiments BM@N and MPD of the NICA project”.
- **2009 – 2011:** Executor, RFBR grant No. 09-07-00459-a “Development of a calculation technique and parallel software for verifying the characteristics of non-stationary electromagnetic fields”.

AWARDS

- **2025:** 2nd JINR prize for 2024 in the section “Scientific methodical and technical works”.
- **2023:** JINR Honorary Diploma.
- **2021:** JINR Certificate of Honour.
- **2018:** VBLHEP scholarship named after academician M. A. Markov for young scientists.
- **2018, 2017:** 2nd VBLHEP prize in the direction “Particle and nuclear physics, development of a physics program and modeling of processes for NICA”.
- **2017:** 2nd JINR prize for young scientists in the nomination “Scientific methodical and technical works”.
- **2016:** Winner of the young scientists and specialists competition of the Moscow region state programme “Housing”.
- **2015:** 1st JINR prize for young scientists for applied scientific and technical work.
- **2015:** VBLHEP scholarship named after academician V. I. Veksler for young scientists.
- **2015:** Diploma for the best talk of young scientists in the section “Non-relational databases and heterogeneous repositories”, NEC'2015, Montenegro.
- **2016, 2012, 2011:** JINR grants for young scientists.
- **2005:** Special state scholarship of the Government of the Russian Federation.

WORK EXPERIENCE (UP TO THE SCIENTIFIC ACTIVITY)

- **10.2003 – 09.2009:** Software engineer, “SystemProm” (Moscow). The topic is “Development of the automated system for processing, storage and verification of images of printed circuit boards”: developing parallel algorithms and software for image processing (09.2003 – 01.2006, project support until the end of 2006; PL: C++, MFC, MPI); the diploma thesis was defended on this topic. 09.2006 – 09.2009: development of modules for a geoinformation system (PL: C++, C#).
- **11.2008 – 04.2009:** External software engineer, “Intelligence” Ltd. (Moscow). The topic is “Parallelization of magnetic fields processing and visualization refinement”. PL: C++.
- **07.2006 – 12.2008:** Software engineer (Moscow). The topic is “Development of the digital filters and specialized software for parallel signal processing on the cluster system”. Responsible executive and head of the development team of 6 people: development of the parallel part. PL: C++, MPI, OpenMP.

- **03.2006 – 06.2006:** Software engineer, Moscow Research Television Institute. The topic is “Non-algorithmic refinement of the software for face and license plate recognition from the camera images”. PL: Borland Delphi.
- **12.2005 – 08.2006:** Software engineer (Moscow). The topic is “Refinement of the corporate database interface based on Adabas DBMS”. PL: Software AG Natural.

TEACHING EXPERIENCE

- **09.2020 – current:** Associate professor (2nd semester), Dubna State University. The subject is “Methods for processing and analysing data from experimental facilities in the CERN ROOT environment”.
- **09.2006 – 09.2009:** Teaching assistant, National Research Nuclear University MEPhI. The subjects are “Computer graphics”, “Databases”, “Architecture of information systems”, “Methods and tools for multimedia information processing”.
- **2007 – 2022:** Scientific leadership: 12 defended graduation theses (MEPhI, Dubna State University, St. Petersburg State University) and course works.

INVITED TALKS, LECTURES AND SEMINARS

- **2026:** MSCHEP2026, Listvyanka, Lake Baikal: Experimental Data Processing and Computing Software for BM@N at NICA.
- **2022, 2023, 2025:** JINR Schools on Information Technologies: “Software systems for data processing of the BM@N experiment at NICA”.
- **2023, 2024:** Lecture “Why pay a programmer in a large physics experiment”: JINR Scientists' Club; INP, Almaty, Kazakhstan.
- **2023:** 65th All-Russian scientific conference of MIPT; MEPhI–JINR workshop.
- **2019 – 2021:** Seminars on the software of the NICA experiments: MIPT, St. Petersburg State University, MEPhI; lectures at the International School “Big Data Analytics”, Dubna State University.
- **2019:** International School of Nuclear Physics “JINR Days in Bulgaria”, Borovets: The NICA project at JINR: challenges and status.
- **2018:** Neutrino Week, IPHC, Strasbourg, France: FairROOT framework for HEP experiments at accelerators.
- **2011 – 2018:** Scientific seminars: RCC MSU (2011), MCST and INEUM (2013), VBLHEP JINR (2015, 2018).

TECHNICAL KNOWLEDGE

- Operating systems: Linux (bash), MS Windows.
- Programming: OOP, Git/GitLab/SVN, C++ (CERN ROOT, Boost, MFC), C# (WPF), Python, basics of Java and ASM, Borland Delphi. Profilers: Google perftools (gprof), Intel Parallel Studio.
- Parallel programming: MPI/MPICH, OpenMP, pthreads, SLURM/Torque/SGE.
- Databases: BPWin, ERWin, SQL, PostgreSQL (PL/pgSQL), Oracle (PL/SQL basics), MS SQL Server (Transact-SQL basics), Entity Framework/LINQ, ADO/.NET basics, Software AG Natural.
- IT solutions: Grafana, Docker Compose.

FIELDS OF SPECIAL INTEREST

- Scientific computing, HPC, development of parallel software for multicores and distributed systems, development of information systems, architecture and design of software systems.

PERSONAL SKILLS

- Language skills: English – Intermediate, German – beginner, Russian – native.
- Easy to train, quickly learn new programming languages and technologies, disciplined, hardworking, responsible, experience in team leading and teamwork in large international collaborations.

Updated: November 2026