Ivan Gordeev
Curriculum Vitae

Personal Website
gordeev.page

Links
researchgate.net

github.com
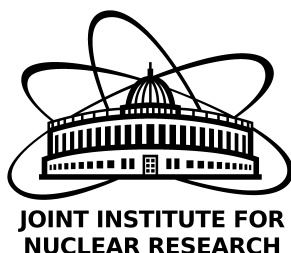
Languages
Russian ★★★★★
English ★★★★☆

Alma Mater

Dubna State University

JOINT INSTITUTE FOR NUCLEAR RESEARCH

General Information

Full Name: Ivan Sergeevich Gordeev
Sex: Male
Date of Birth: 21th July 1996
Place of Birth: Russian Federation
Nationality: Russian
Marital Status: Married

Professional career

2023 – present **Researcher** — Joint Institute for Nuclear Research
Researcher at the Laboratory of Radiation Biology. Radiation Research Department of the base facilities. Joint Institute for Nuclear Research (Dubna, Russia)

2021 – present **University Lecturer** — Dubna State University
Lecture courses: "Physics and technology of accelerators", "Processing and analysis of scientific data using high-level programming language". Dubna State University (Dubna, Russia)

2020 – 2023 **Junior Researcher** — Joint Institute for Nuclear Research
Junior Researcher at the Laboratory of Radiation Biology. Section of Radiation Research. Research group for studying radiation fields of JINR basic facilities and environment. Joint Institute for Nuclear Research (Dubna, Russia)

2017 – 2020 **Laboratory Assistant** — Joint Institute for Nuclear Research
Laboratory Assistant at the Laboratory of Radiation Biology. Section of Radiation Research. Research group for studying radiation fields of JINR basic facilities and environment. Joint Institute for Nuclear Research (Dubna, Russia)

Education

28.11.24 **PhD in Physics and Mathematics** — Joint Institute for Nuclear Research
Awarded the academic degree of Doctor of Philosophy (PhD) in Physics and Mathematics by decision of the Dissertation Council of the Joint Institute for Nuclear Research for IT and Computational Physics (Dubna, Russia)

2018 – 2020 **MSc (with honours) in Physics** — Dubna State University
Dubna State University. Department of Biophysics. Faculty of Natural and Engineering Sciences (Dubna, Russia)
Specialization: Radiation Biophysics and Astrobiology
Thesis title: "Monte Carlo Simulation of Radiation Fields Inside the Spacecraft and Calculation of Astronaut Doses on the Earth-Mars Flight"
GPA: 5.00 / 5.00

2014 – 2018 **BSc (with honours) in Physics** — Dubna State University
Dubna State University. Department of Biophysics. Faculty of Natural and Engineering Sciences (Dubna, Russia)
Specialization: Human and Environmental Radiation Safety
Thesis title: "Simulation of Radiation Fields Inside Spacecraft in the Earth's Environment"
GPA: 4.95 / 5.00

Activities & Awards

28.11.24   **PhD thesis defense**   Dissertation Council of the JINR for IT and Computational Physics
Successful defense of the thesis: "Modelling of mixed radiation fields in spacecraft and on charged particle accelerators". Supervisor Dr. habil. A. N. Bugay.
Abstract: The PhD thesis presents the methodology and results of computer modelling of the spacecraft's internal radiation field during missions outside the Earth's magnetosphere, aimed at predicting the radiation risk to astronauts. The simulations were carried out using the Monte Carlo FLUKA code. New approaches were developed to reproduce a mixed radiation field with similar characteristics under terrestrial conditions using heavy charged particle accelerators. A mathematical model of a specialized simulator was developed and implemented in the gcrs software package. It is demonstrated that the proposed GCR simulator scheme enables unique experimental research in space radiobiology and can be implemented on the applied research beamlines of the NICA Complex at JINR. Link to the PhD materials: `https://dissertations.jinr.ru/en/Dissertations/Materials/252`

28.7-21.9.24   **Supervision in Student Program**   Joint Institute for Nuclear Research
Supervision in the START JINR Student Program 2024 at Joint Institute for Nuclear Research. Russia, Dubna
Results: Under my supervision, student Anthony Walwyn Cadenas from University of Havana (Cuba) successfully accomplished his work on the topic: "Treatment planning and dosimetry at the SARRP facility" during his 8 weeks stay. Link to the report: `https://students.jinr.ru/uploads/report_files/report_student_2074_project_411.pdf`

23-25.04.24   **International scientific forum**   Samarkand State University
The Third International Forum "Physics - 2024" hosted by the Samarkand State University. Poster presentation: "A New Type of Particle Accelerator-Based Simulator of Cosmic Radiation Fields". Samarkand, Uzbekistan.
Results: Certificate of participation

24-28.10.22   **Scientific conference**   Joint Institute for Nuclear Research
Participation in the XXVI International Scientific Conference of Young Scientists and Specialists (Dubna, Russia). Topic of report: "A new type of ground-based simulator of inner radiation field of a spacecraft in deep space"
Results: Certificate of Attendance

7-9.10.22   **Scientific-popular festival NAUKA 0+**   Lomonosov Moscow State University
Lecturer in the scientific-popular festival NAUKA 0+ (Moscow, Russia). Topic: "From Monte Carlo to Mars: Radiation inside an interplanetary spacecraft". Festival programme: `https://festivalnauki.ru/upload/iblock/82c/dvb26kc53fc1n1cew2sxytxrqigj5nf7/fn2022_program.pdf` (page 42).
Results: Certificate of Attendance

24-25.02.22   **First Prize JINR award**   Joint Institute for Nuclear Research
First Prize award by the decision of the 131$^{\text{st}}$ session of the JINR Scientific Council for best papers in the field of applied physics research (Dubna, Russia). Topic: "Calculation and modeling of the radiation field inside a spacecraft beyond Earth's magnetosphere"
Results: First Prize award

21.9.21   **Online videoconference**   GSI Helmholtz Center for Heavy Ion Research
Participation in the ESA–FAIR Space Radiation Summer School special videoconference (Darmstadt, Germany)
Results: Certificate of Attendance

19-22.7.21   **Online PHITS course**   Japan Atomic Energy Agency (JAEA)
Participation in the advanced course on PHITS (Tokai, Japan)
Results: Certificate of the PHITS advanced course attendance

1-5.2.21 **Online PHITS course** Japan Atomic Energy Agency (JAEA)
Participation in the basic course on PHITS (Tokai, Japan)
Results: Certificate of the PHITS basic course attendance

5-16.10.20 **Online FLUKA training** The European Organization for Nuclear Research (CERN)
Attended the FLUKA Beginners' Online Training. Switzerland, Meyrin.
Results: Certificate of the FLUKA basic course attendance

15-16.4.19 **Scientific-practical conference** Dubna State University
Participation in the XXVI annual regional scientific-practical conference of
students, postgraduates and young specialists at Dubna State University
with the topic of report: " Calculation of the radiation fields from the GCR
inside the spacecraft during interplanetary flights ". Russia, Dubna
Results: Best Student Presentation Award

3.12.18 **Scientific-popular student conference** Dubna State University
Participation in the scientific-popular student conference in English:
" Universe of Science. Challenges and Solutions " at Dubna State Univer-
sity with the topic of report: " Breaking the Wall of Cosmic Radiation using
Particle Accelerator "
Results: Best Student Presentation Award and nomination for " The Best
Communicative Skills and Best Presentation "

22.10.18 **University competition** Dubna State University
Participant of the " Best students of the Dubna State University " competition
Results: Best Student of the Dubna State University Award

17-19.10.18 **International Conference** International Conference Hall in Dubna
Participant of the meeting of the International Conference " Modern Prob-
lems of Space Radiobiology and Astrobiology "
Results: Co-author of the conference report: " Modeling Radiation Fields
Inside Spacecraft at JINR's Nuclotron "

23.7-13.9.18 **Summer Student Program** GSI Helmholtz Center for Heavy Ion Research
Participation in the HGS-HIRe Summer Student Program 2018 at GSI. Ger-
many, Darmstadt
Results: skills received in using MC transport code FLUKA, in work with
ROOT framework. The skills of scientific writing and presentation, as well as
teamwork skills and communication in a foreign language were improved.
Attended a number of lectures on various fields of physics. Got acquainted
with the main facilities of the GSI (UNILAC, ESR, HADES, HILITE) and
the FAIR project. A report on the work in the research group was written:
" Comparison of MCNPX, GEANT4 and FLUKA Simulations of the Radia-
tion Situation Inside a Spacecraft in Deep Space ", and a presentation was
made on the closing section. The report is published in the proceedings of
the 2018 HGS-HIRe Summer Student Program

26.1-5.2.18 **Personnel exchange program (Winter School)** Kindai University
Participation in the personnel exchange program "Monodukuri Engineer in
Japan and Russia" winter student school at Kindai University. Japan, Osaka
Results: Communication skills in a foreign language were improved. Got
acquainted with Japanese culture, manufactory and Monodukuri technique

2.10.17 **International pitch competition** Visit Centre of Joint Institute for Nuclear Research
Participation in the " Falling Walls Lab Dubna ", international Lab season
stage at Joint Institute for Nuclear Research. Russia, Dubna
Results: Certificate of participation

16.12.16 **Scientific-popular student conference** Dubna State University
Participation in the scientific-popular student conference in English
" Discovering the Mysteries of Science " at Dubna State University with the
topic of report: " Feynman Diagrams ". Russia, Dubna
Results: Second Best Presentation Award and nomination for the " Best
Pronunciation "

Publications

1. I. S. Gordeev & A. N. Bugay
   Computer Physics Communications, vol. 305 (2024)
   "Computer modeling of a new type galactic cosmic rays simulator"
   DOI: 10.1016/j.cpc.2024.109346

2. I. S. Gordeev & G. N. Timoshenko
   Physics of Particles and Nuclei Letters, vol. 19, pp. 402 – 407 (2022)
   "Albedo of Neutrons of Relativistic Energies"
   DOI: 10.1134/S1547477122040136

3. A. V. Butenko, I. S. Gordeev, A. D. Kovalenko, M. Paraipan,
   E. M. Syresin, and G. N. Timoshenko
   Physics of Particles and Nuclei Letters, vol. 19, pp. 123 – 128 (2022)
   "Prediction of Radiation Environment around NICA Complex"
   DOI: 10.1134/S1547477122020042

4. I. S. Gordeev & G. N. Timoshenko
   Life Sciences in Space Research, vol. 30, pp. 66 – 71 (2021)
   "A new type of ground-based simulator of radiation field inside a spacecraft in deep space"
   DOI: 10.1016/j.lssr.2021.05.002

5. G. N. Timoshenko & I. S. Gordeev
   Physics of Particles and Nuclei Letters, vol. 18, pp. 799 – 805 (2021)
   "Reference Radiation Field for GCR Chronic Exposure Simulation"
   DOI: 10.1134/S1547477121070128

6. G. N. Timoshenko & I. S. Gordeev
   Planetary and Space Science, vol. 199 (2021)
   "Computation of linear energy transfer of space radiation in biological tissue analog"
   DOI: 10.1016/j.pss.2021.105190

7. G. N. Timoshenko & I. S. Gordeev
   Physics of Particles and Nuclei Letters, vol. 17, n. 7, pp. 951 – 957 (2020)
   "Calculating the Linear Energy Transfer Distribution in Radiobiological Experiments on the U400M Cyclotron"
   DOI: 10.1134/S1547477120070055

8. G. N. Timoshenko & I. S. Gordeev
   Physics of Particles and Nuclei, vol. 51, n. 5, pp. 988 – 993 (2020)
   "Estimation of the Astronaut's Doses inside the Spacecraft Habitable Module in Deep Space"
   DOI: 10.1134/S106377962005007X

9. G. N. Timoshenko & I. S. Gordeev
   Physics of Particles and Nuclei Letters, vol. 17, n. 3, pp. 379 – 388 (2020)
   "Forecasting Radiation Environment around the NICA Booster"
   DOI: 10.1134/S1547477120030152

10. G. N. Timoshenko & I. S. Gordeev
    Journal of Astrophysics and Astronomy, vol. 41 (2020)
    "Simulation of radiation field inside interplanetary spacecraft"
    DOI: 10.1007/s12036-020-9620-3

11. G. N. Timoshenko, A. R. Krylov, M. Paraipan, I.S. Gordeev
    Radiation Measurements, vol. 107, pp. 27 – 32 (2017)
    "Particle Accelerator-Based Simulation of the Radiation Environment on Board Spacecraft for Manned Interplanetary Missions"
    DOI: 10.1016/j.radmeas.2017.10.006

Preprints

1. Ivan Gordeev
   SSRN preprint (2025)
   "Microdosimetry-Based Characterisation of X-Ray Irradiators and Dose Enhancement Factor Study for Cell Monolayer Irradiation"
   Available at SSRN: `http://dx.doi.org/10.2139/ssrn.5165976`

2. Ivan Gordeev
   ArXiv e-prints [cs.HC, hep-ex] (2020)
   "FitsGeo – Python package for PHITS geometry development and visualization"
   arXiv:2008.03298

Patents

1. G. N. Timoshenko & I. S. Gordeev
   Patent №2761376 (RU) (2021)
   "A device for modeling mixed radiation fields on high energy heavy ion beams for the purposes of experimental radiobiology"

Registered Software

1. I. S. Gordeev
   Certificate of state registration of a software №2024661642 RU (2024)
   "GCRs Spectra program for calculating the spectra of primary particles of galactic cosmic rays at specific solar activity"

2. I. S. Gordeev
   Certificate of state registration of a software №2024618617 RU (2024)
   "A data visualization program for a computer model of an irradiation facility model simulating a mixed radiation field at charged particle accelerators"

3. I. S. Gordeev
   Certificate of state registration of a software №2023667527 RU (2023)
   "A program for optimization of parameters of an irradiation facility model simulating a mixed radiation field at charged particle accelerators"

Software in Use

Ubuntu OS: FLUKA&Flair, PHITS, GEANT4, ROOT, GnuPlot, Jupyter Notebook, LaTeX, GIMP, Inkscape, PyCharm, Visual Studio Code, Git

Windows OS: Microsoft Office applications, Origin, Mathcad, Autodesk Inventor, Auto-CAD

About me

I specialize in radiation fields modeling for accelerator shielding and dosimetry. My work focuses on using Monte Carlo transport codes such as FLUKA and PHITS for radiation transport simulations, along with expertise in GEANT4, ROOT, and programming languages such as Python, C++, and Fortran. I am passionate about radiation safety, computational modeling, and the development of shielding strategies for accelerators.

My key character traits are perseverance and the ability to learn quickly. One of my favorite physicists is Richard Feynman, and I'm especially inspired by one of his famous quotes: "What I cannot create, I do not understand". I see this expression as my personal credo. To me, it means that if you can't create something—whether it's in your mind or in real life, through an experiment—you can't truly understand it. Deep understanding requires inventing new approaches and developing models that describe the problem at hand. After long, persistent reflection and attempts to solve a problem, a solution eventually emerges. So, let's create in order to understand!