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 degree (kandidat nauk)** — Joint Institute for Nuclear Research
PhD thesis in Physics and Mathematics: “Modelling of mixed radiation fields in spacecraft and on charged particle accelerators”, supervisor Dr. habil. A. N. Bugay. Place of defence: JINR Dissertation Council 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 degree** JINR Dissertation Council for IT and Computational Physics
Successful defense of the dissertation: “Modelling of mixed radiation fields in spacecraft and on charged particle accelerators” in Physics and Mathematics at Joint Institute for Nuclear Research. Russia, Dubna
Abstract: The PhD thesis presents the methodology and results of computer modelling of the spacecraft’s internal radiation field during flights outside the Earth’s magnetosphere for predicting the radiation risk of astronauts. The simulation of the interaction of galactic cosmic rays (GCR) with the spacecraft model was performed by the Monte Carlo FLUKA program. Based on the results of the modelling, new approaches were developed to reproduce a mixed radiation field with similar characteristics in terrestrial conditions using heavy charged particle accelerators. A mathematical model of the special simulator was developed and implemented in the gcrs software code. The initial data necessary for the development of the GCR simulator model were obtained using the FLUKA and PHITS Programs. It is shown that the scheme of the GCR simulator proposed in the PhD thesis will allow for further 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 **Scientific conference** Samarkand State University
The Third International Forum “Physics - 2024” on the basis of 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

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 tutorial** Japan Atomic Energy Agency (JAEA)
Participation in the advanced course on PHITS (Tokai, Japan)
Results: Certificate of Attendance

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

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

17.4.18 **Scientific-practical conference** Dubna State University
Participation in the XXV annual regional scientific-practical conference of students, postgraduates and young specialists at Dubna State University with the topic of report: "Simulation of Radiation Fields Inside Spacecraft in the Earth's Environment". Russia, Dubna
Results: Publication in the conference proceedings, certificate of participation

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 **Pitch competition** Visit Centre of Joint Institute for Nuclear Research (JINR)
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

OS Knowledge

Linux ★★★★★
Windows ★★★★★

Programming Skills

Python ★★★★★
Bash ★★★★☆
Fortran ★★★☆☆
C++ ★★★☆☆

Registered Softwares

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 radiation 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"

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"

Preprints

1. I. S. Gordeev, A. N. Bugay
   Preprint of the Joint Institute for Nuclear Research [E11-2024-17] (2024)
   "Computer modeling of a new type galactic cosmic rays simulator"

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

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, AutoCAD, Photoshop

Hobbies

DIY, computer modeling, Arduino-based modeling.

About me

My key character traits are perseverance, honesty, and the ability to learn fast. One of my favorite physicists is Richard Feynman and I really like one of his famous quotes: "What I Cannot Create, I Do Not Understand". I perceive this expression as my credo. And I interpret it in the way that if you can't "create" something, no matter how: in your mind, or in real life — performing an experiment, then you can't understand it properly. To understand something better you always need to invent new approaches and develop new models describing actual problem. After a long and persistent reflection and attempts to solve the problem a solution comes. So, let's create in order to understand!