Vyacheslav Fedorov

Personal Data

Place and Date of Birth:	Novosibirsk, Russia | 28 April 1998
Address:	Uchenicheskaya str. 2A — 171, 630068, Novosibirsk, Russia
Phone:	+7 960 7924340
Marital status:	Married with one children
Nationality:	Russian
email:	fuodorov1998@gmail.com
Website:	fuodorov.github.io

Summary of Qualification

I began to practice general astrophysics and radio astronomy at the Pushchino Radio Astronomy Observatory in the summer of 2015. In the fall of 2015, I entered the M.A. Lavrentiev physics and mathematics school at Novosibirsk State University (NSU). In 2017, I practiced at the Vega educational automated astrophysical complex at NSU as a student at NSU. At the invitation of the fall of 2017, I began to work as a laboratory assistant in the atmospheric research department of NSU in the space experiment laboratory, where I investigated the possibility of creating an IR horizon sensor for an ultra-small spacecraft and at the same time practiced teamwork and programming in Python and C++.

Since the fall of 2018, I have been practicing the Budker Institute of Nuclear Physics (BINP). I am engaged in the transportation of a high-current electron beam in a linear induction accelerator LIA–20. I work closely with the ASTRA and WARP PIC-codes, with the SAM program, and also develop the Python library KENV and REDPIC. I studied the Python syntax in depth and was interested in machine learning.

Since 2020 I have been studying at ITMO University in the field of Optoelectronic devices and systems.

Work Experience

Current — Laboratory assistant in BINP, Novosibirsk

Sep 2018 — *Transportation of a high-current electron beam in LIA–20*

The article "Transportation of a high-current electron beam in a linear induction accelerator LIA–5" is written. Released KENV Python library. Learned to work with PIC-codes ASTRA and WARP. We are developing our own PIC-code in Python. Improved programming skills in Python, in particular, I chose Jupiter Notebooks for scientific tasks. I gain knowledge of the beam dynamics in the accelerators.

Sep 2018 — Laboratory assistant in NSU, Novosibirsk

Sep 2017 — *Creating an IR horizon sensor for an ultra-small spacecraft*

A report is presented on the possibility of creating an IR horizon sensor for an ultra-small spacecraft, in particular, a sample of an IR horizon sensor and a test bench are made, test software for an IR sensor is written, and successful tests have been carried out on a test bench. Learned to work in a development team with Git, acquired programming skills in Python and C++. Gained knowledge about orientation systems and radiation protection of spacecraft.

Computer Skills

Basic Knowledge:	HTML, CSS, JS, Linux
Intermediate Knowledge:	C, C++, PostgreSQL, Mathcad, Compas-3D, AutoCAD
Advanced Knowledge:	Python, MATLAB, GitHub, LaTeX, ASTRA, WARP, SAM

Languages

Russian:	Mothertongue
English:	Intermediate Knowledge
German:	Intermediate Knowledge

Papers

March 2020 — D. Nikiforov, M. Blinov, V. Fedorov, A. Petrenko et al., **"Transportation of a high-current electron beam in a linear induction accelerator LIA–5"**
Particles and Nuclei, Letters | Publication

June 2018 — V. Fedorov and M. Zadorozhny, **"Study of the possibility of creating a horizon sensor for the orientation system small spacecraft based on IR temperature sensor"**
Labwork in NSU | Publication

Dec 2017 — V. Fedorov and A. Yatsky, **"Experimental study of high-frequency ignition parameters glow discharge"**
Labwork in NSU | Publication

Dec 2016 — V. Fedorov, O. Bragin, L. Prokopyeva, **"Statistical processing of measurement results"**
Labwork in NSU | Publication

Qualifications

Spring 2019 — Driving license (category B), **driving school "Lights"**, Novosibirsk

Spring 2017 — German language courses (A2), **Goethe Institut**, Novosibirsk

Summer 2016 — German language courses (A1), **Goethe Institut**, Novosibirsk

Spring 2016 — All-Russian Olympiad in Astronomy, **MSU**, Saransk

Spring 2012 — SAMBO Mayor Cup, **sports school "Source"**, Novosibirsk

Education

Current Sep 2020	Engineer student, **ITMO University**, St. Petersburg Progress: 1/6 course | Major: Opto-electronic devices and systems
Current Nov 2020	School of Data Analysis, **Yandex**, Moscow Thesis: "Python Developer"
August 2020	Terascale Summer School, **Deutsches Elektronen-Synchrotron**, Hamburg Thesis: "Particle- and astro-particle physics" | Advisor: Olaf Behnke
July 2020 Sep 2016	Physics student, **Novosibirsk State University**, Novosibirsk Progress: 3/4 course | Major: Physics of accelerators Thesis: "Transportation of a high-current electron beam in a linear induction accelerator LIA–20" | Advisor: Danila Nikiforov GPA: 4.84/5 | Detailed List of Exams
July 2016 Sep 2015	General high school education, **M.A. Lavrentiev physics and mathematics school at Novosibirsk State University**, Novosibirsk GPA: 4.91/5 | Detailed List of Exams
August 2015	Summer physics and mathematics school in **M.A. Lavrentiev physics and mathematics school at Novosibirsk State University**, Novosibirsk Thesis: "Olympiads mathematics and physics" Advisor: Mikhail Afanasyev | Certificate
June 2015	Summer school of young astrophysicist in **Pushchino Radio Astronomy Observatory**, Pushchino Thesis: "Theoretical and observational astrophysics" Advisor: Vladimir Samodurov | Certificate
Spring 2015	School of communication skills of **center "Spring"**, Novosibirsk Thesis: "Secrets of effective communication" Advisor: Catherine Belousova | Certificate
May 2015 Sep 2014	Distance education center of **Lomonosov Moscow State University** Thesis: "The basics of astronomy in tasks" Advisor: Natalya Shatovskaya | Certificate

Several Facts About Me

I am interested in beam dynamics in linear accelerators and astrophysics.
I prefer Python to other programming languages.
I have experience in public speaking (up to 50 spectators).
I have a rank in chess and Russian wrestling Sambo.
My favorite book is Anna Karenina by Tolstoy.

References

Feb 2020

Dr. Alexey Petrenko, **BINP**, Novosibirsk

I know Vyacheslav Fedorov as a well-qualified physicist...

I know Vyacheslav for about one year since we started working on simulations of intense space charge dominated beams at Budker INP. Vyacheslav Fedorov's work is focused on the theoretical part of our project, namely the development of a fast beam envelope code and its benchmarking against more detailed Particle-in-Cell codes (like WARP and ASTRA) as well as experimental data. This work was very successful and over less than a year Vyacheslav was able to develop an analytical and numerical framework implemented as a modern Python library: kenv. This code proved to be a very useful tool in the design and operations of several high-current accelerators.

| Read completely

Jan 2020

Dr. Pavel Logatchov, **BINP**, Novosibirsk

While working in BINP Vyacheslav showed himself as a promising young specialist and researcher...

With his active participation, a code based on the solution of the Kapchinsky-Vladimirsky system of equations was developed. Now this code is actively used to tune a high-current linear accelerator in BINP. In addition, he have high programming scills on Python. The last task that he solved on Python was to use a genetic algorithm for unfolding electron beam parameters using spot size measurement from solenoid scan.

| Read completely

Certificate of Novosibirsk State University

Student: Fedorov Vyacheslav Vasilievich

Name of subject	Academic Hrs.	Grade
I. Semester		
Introduction to Technique of Physical Experiment	70	Excellent
English	88	Excellent
Physical Education	16	Passed
Mechanics and the Theory of Relativity	298	Excellent
Measuring Laboratory Course	106	Excellent
Higher Algebra and Analytic Geometry	158	Excellent
Basics of Mathematical Analysis	266	Excellent
Introduction to Information Technology	70	Passed
II. Semester		
English	88	Good
History of Russia	70	Passed
Physical Education	16	Passed
Molecular Laboratory Course	106	Excellent
Basics of Mathematical Analysis	266	Good
Molecular Physics	194	Excellent
Higher Algebra and Analytic Geometry	158	Excellent
Basics of programming	106	Good
Additional chapters of mathematical analysis	34	Passed
Astrophysical Workshop	16	Passed
The emergence of basic mathematical concepts	16	Excellent
III. Semester		
English	70	Excellent
Complex Variable Theory	138	Excellent
Electromagnetic Workshop	108	Excellent
Physical Education	16	Passed
Programming Laboratory Course	106	Excellent
Differential Equations	120	Excellent
Radio Electronics	106	Passed
Basics of Functional Analysis	138	Excellent
Electricity and Magnetism	242	Excellent
IV. Semester		
Radio Electronics Laboratory Course	70	Excellent
English	70	Good
Physical Education	16	Passed
Laboratory Course of Physical Optics	106	Excellent
Computer Simulation of Physical Phenomena	70	Excellent
Analytical Mechanics	140	Excellent
Electrodynamics and Optics	206	Excellent
Basics of Functional Analysis	138	Excellent
Radio Electronics	106	Excellent
Differential Equations	120	Excellent

Name of subject	Academic Hrs.	Grade
V. Semester		
Astronomy	70	Excellent
Philosophy	70	Excellent
English	70	Good
Vector and tensor analysis	106	Excellent
Engineering Tools of Automation in Scientific Researches	16	Excellent
Cycle accelerators	70	Excellent
Electrical optics and beam physics	68	Excellent
Microwave electrodynamics	110	Good
Methods of Mathematical Physics	140	Excellent
Quantum Mechanics	174	Excellent
Physics of Continuous Medium	140	Excellent
VI. Semester		
Practice in the Institute	26	Passed
Atomic Laboratory Course	108	Excellent
Philosophy	108	Good
Linear accelerators	108	Excellent
	Gpa	**4.84/5**

Certificate of secondary education

The structural subdivision of Novosibirsk State University - Specialized Educational and Scientific Center of the University, Novosibirsk

Student: Fedorov Vyacheslav Vasilievich

Name of subject	Grade
Russian language	Excellent
Literature	Excellent
Mathematics	Excellent
History	Good
Social Studies	Excellent
Physics	Excellent
Chemistry	Excellent
Biology	Excellent
German language	Excellent
Computer science	Excellent
Physical Culture and Life Support	Excellent
Astronomy	Passed
Specialized Course in Mathematics	Passed
Specialized Course in Physics	Passed
Gpa	**4.91/5**