

DMITRY A. DUEV

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EDUCATION

- 2010 – 2012 **Ph.D. in Astronomy**, Department of Physics, Lomonosov Moscow State University (MSU), Russia. Specialization: astrometry and celestial mechanics. Thesis: “Astrometric Applications of Space Very Long Baseline Interferometry”.
- 2004 – 2010 **Specialist** (roughly equivalent to **B.Sc. + M.Sc.**), Department of Physics, Lomonosov Moscow State University (MSU), Russia, Specialty: astronomy. Specialization: astrometry. Diploma with honors. GPA: 4.0/4.0, Summa cum laude. Thesis: “Investigation of the Tropospheric Impact on Signal Delay in Radio Astronomical Observations”.

WORK EXPERIENCE

- 2018 – pres. **Research Scientist**, Department of Astronomy, California Institute of Technology, Pasadena, CA, USA.
- 2015 – 2018 **Postdoctoral Scholar in Astronomy**, Department of Astronomy, California Institute of Technology, Pasadena, CA, USA.
- 2013 – 2015 **Postdoctoral Researcher, Support Scientist**, Science Operations and Support group and Space Science and Innovative Applications group, Joint Institute for VLBI ERIC (JIVE), Dwingeloo, The Netherlands.
- 2010 – 2012 **Visiting Researcher, trainee**, Space Science and Innovative Applications group, Joint Institute for VLBI in Europe (JIVE), Dwingeloo, The Netherlands.
- 2010 – 2013 **Engineer** (part-time), Laboratory of Gravimetry, Sternberg Astronomical Institute, Lomonosov Moscow State University (SAI MSU), Moscow, Russia.
- 2009 **Researcher** (part-time) Dorodnitsyn Computing Centre of the Russian Academy of Sciences (CC RAS), Moscow, Russia.
- 2006 – 2008 **Technician** (part-time), Laboratory of Gravimetry, Sternberg Astronomical Institute, Lomonosov Moscow State University (SAI MSU), Moscow, Russia.

SELECTED TECHNICAL SKILLS

Knowledge/experience: algorithms, data structures, networking, testing, API design, large databases, distributed systems, machine learning, deep learning

Github profile: <https://github.com/dmitryduev>

Operating systems	GNU/Linux (RHEL, Fedora, Ubuntu, OpenSUSE), MacOS, Windows
Programming	Python, MATLAB, C++, C, Fortran, JavaScript, PHP, bash
Containerization	Docker, Docker-compose, Kubernetes
Streaming/messaging	Kafka
Version control	git, svn
Full-stack web dev.	Python (Flask, aiohttp, CherryPy), JavaScript (Node.js, Socket.io), HTML/CSS
Machine learning	TensorFlow, Keras, PyTorch, scikit-learn
Databases	MongoDB, PostgreSQL, redis
Document preparation	LATEX, BibTEX, MS Office
Astronomical software	Radio astronomy observations scheduling (SCHED) and data reduction (AIPS, CASA); geodetic data reduction (BERNESE)

OBSERVING EXPERIENCE

Radio, VLBI European VLBI Network (EVN), Very Long Baseline Array (VLBA), Long Baseline Array (LBA)

Optical, IR Kitt Peak 2.1m (adaptive optics observations with Robo-AO, over 100 nights), Keck-II (NIRC2, ESI)
Miscellaneous GPS/GLONASS and gravimetric field surveys

SCIENTIFIC INTERESTS

Astroinformatics Distributed data processing systems, high performance computing, GPU computing, machine/deep learning, mathematical methods in data processing and analysis
Radio astronomy Interferometric and Doppler measurements of spacecraft. Standard, near-field and space VLBI, signal delay modelling, propagation effects, phase calibration methods, imaging. VLBI and Doppler data processing and analysis for the use in planetary science, interplanetary plasma physics, geodesy, and fundamental physics.
Optical/NIR astronomy Astrometry of asteroids with adaptive optics, imaging of Solar system planets with adaptive optics

PUBLICATIONS

60+ publications (including 20+ refereed publications) with 400+ cumulative citations according to Google Scholar:
<https://scholar.google.com/citations?user=wkew9IAAAAJ>

INVITED SEMINAR TALKS AND COLLOQUIA

2017/10 Harvard-Smithsonian Center for Astrophysics (CfA), Cambridge, MA, USA. Host: Peter Veres
2016/05 NASA Jet Propulsion Laboratory (JPL), Pasadena, CA, USA. Host: Slava G. Turyshev
2016/02 National Radio Astronomy Observatory (NRAO), Socorro, NM, USA. Host: Paul Demorest
2015/02 California Institute of Technology, Pasadena, CA, USA. Host: Shrinivas R. Kulkarni
2013/10 ASTRON Netherlands Institute for Radio Astronomy, Dwingeloo, The Netherlands. Host: Leonid Gurvits
2012/05 ESA European Space Operations Center (ESOC), Darmstadt, Germany. Host: Trevor Morley
2011/11 ASTRON Netherlands Institute for Radio Astronomy, Dwingeloo, The Netherlands. Host: Leonid Gurvits

SELECTED CONFERENCE PRESENTATIONS

1. ZTF Alert Stream (ZTF summer school, Caltech, Pasadena, CA, USA, 2018)
2. Supporting ZTF TDA: The Caltech effort (ZTF collaboration meeting, Caltech, Pasadena, CA, USA, 2018)
3. Spacecraft tracking (VLBI Futures meeting, Texas Tech, TX, USA, 2018)
4. Robo-AO Kitt Peak: the first dedicated adaptive optics observatory (Astroinformatics-2017, Cape Town, South Africa)
5. Radio Occultation Experiments with Venus Express and Mars Express using the Planetary Radio Interferometry and Doppler Experiment (PRIDE) Technique (AGU Fall Meeting-2017, USA)
6. PRIDE-JUICE: Ground-based VLBI observations of spacecraft (EPCS-2017, Riga, Latvia)
7. Precise radio Doppler and interferometric tracking of spacecraft in service of planetary science (DPS/EPSC-2016)
8. Robo-AO Kitt Peak: status of the system and deployment of a sub-electron read noise IR camera to detect low-mass companions (SPIE, USA, 2016)
9. Testing General Relativity with spacecraft Doppler tracking (Boutiques and Experiments-2016, Caltech, USA)
10. Advancing spacecraft Doppler and interferometric data processing technique for planetary science (First International Workshop on VLBI Observations of Near-field Targets, IGG, Bonn, Germany, 2016)
11. Reliability and performance of the EVN (EVN TOG meeting, NASA's DSCC, Robledo de Chavela, Spain, 2015)
12. Scintillation of spacecraft radio signals on the interplanetary plasma (EGU General Assembly 2015, Vienna, Austria)
13. Planetary Radio Interferometry and Doppler Experiment (PRIDE) for Planetary Atmospheric Studies (EGU GA-2015)
14. Radio Science Observations of the Mars Express December 2013 Phobos Flyby and Implications for the Satellite's Gravity Field (AGU Fall Meeting-2014)
15. Enhancing Gaia's astrometric accuracy by means of near-field VLBI (EWASS-2014, Geneva, Switzerland)
16. Progress in VLBI Tracking of GNSS Satellites at GFZ (IVS General Meeting-2014)
17. The Wettzell-Onsala G130128 Experiment (IVS General Meeting-2014)
18. Testing the orbit determination accuracy of RadioAstron using Doppler and VLBI measurements (EVN Symposium, Cagliari, Italy, 2014)

19. Scintillation of Venus and Mars Express radio signal on interplanetary and ionosphere plasma (EVN Symposium, Cagliari, Italy, 2014)
20. Studying Venus' atmosphere and ionosphere with PRIDE (EPSC-2014)
21. Near-field VLBI and its applications to Space Science Missions (EPSC-2014)
22. Vertical structure of Venus polar thermosphere from in-situ data of the Venus Express Atmospheric Drag Experiment (VExADE) (COSPAR-2014)
23. VLBI with RadioAstron as a target and as an instrument (NAC-2013, Lommel, Belgium)
24. Near-field VLBI Correlation (Bonn-Dwingeloo Neighbourhood meeting, Bonn, Germany, 2013)
25. The FP7-ESPaCE project for ephemerides of natural satellites and spacecraft (EPSC-2013)
26. PRIDE for studying the thermosphere of Venus (EPSC-2013)
27. PRIDE for the JUICE mission (EPSC-2013)
28. Status of the Planetary Radio Interferometry and Doppler Experiment (PRIDE) with planetary missions (2MS3, Space Research Institute, Moscow, Russia, 2012)
29. Spacecraft VLBI and Doppler tracking of Venus Express (EPSC-2012)
30. PRIDE and MarcoPolo-R: VLBI applications for Near-Earth Asteroids science (EPSC-2012)
31. Ultra Near-field VLBI experiments (YERAC-2012, Pushchino, Russia)
32. VLBI observations of spacecraft with EVN radio telescopes (NAC-2012, Ameland, The Netherlands)
33. Near-field VLBI experiments (NOVA Fall School, Dwingeloo, The Netherlands, 2011)
34. Status of the Planetary Radio Interferometry and Doppler Experiment (PRIDE): Applications for the Phobos-Soil and other planetary missions (2MS3, Space Research Institute, Moscow, Russia, 2011)
35. Propagation Effects and PRIDE (ESPaCE meeting, Dwingeloo, The Netherlands, 2011)
36. VLBI observations of spacecraft with EVN radio telescopes (YERAC-2011, Jodrell Bank Centre for Astrophysics, UK)
37. Near-field VLBI observations of spacecraft (ASTRON/JIVE Astrofest, Exloo, The Netherlands, 2011)
38. Near-field VLBI experiments with EVN radio telescopes (URSI-BeNeLux Forum, ESA-ESTEC, 2011)
39. VLBI observations of GLONASS satellites (Lomonosov Conference, MSU, 2011)
40. Single baseline GLONASS observations with VLBI: preliminary results (EVGA meeting, MPIfR, Bonn, Germany, 2011)
41. A tropospheric signal delay model for radio astronomical observations (EVGA meeting, MPIfR, Bonn, Germany, 2011)
42. Tropospheric delay modelling for VLBI observations (Lomonosov Conference, MSU, 2010)
43. Tropospheric phase noise effect on VLBI observations of in-beam sources (Lomonosov Conference, MSU, 2009)

SERVICE FOR COMMUNITY

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| 2013 – pres. | Journal referee for Astronomy and Computing, Journal of Geodesy, Planetary and Space Science |
| 2017 | Time allocation committee member for Caltech Optical Observatories |
| 2014 | Astronomy colloquium organizer at ASTRON/JIVE |

TEACHING EXPERIENCE

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| 2015 | Graduate level course "Space-Borne Astrophysics" (MSU) |
| 2012 | Graduate level course "Radio Astrometry" (MSU) |

MISCELLANEOUS: SELECTED AWARDS, ACHIEVEMENTS, AND ADDITIONAL EDUCATION

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| 2012 – 2018 | Massive Open Online Courses (MOOC): Deep Learning Specialization (deeplearning.ai); Algorithms: Design and Analysis, Machine Learning, Cryptography (Stanford); Digital Signal Processing (Ecole Polytechnique Federale de Lausanne); Learning from Data (CaltechX); Autonomous Navigation for Flying Robots (TUMx); Quantum Mechanics and Quantum Computation (BerkeleyX); Introduction to Computer Science and Programming (MITx) |
| 2012 | Best Ph.D. student award, Department of Physics, MSU |
| 2010 | Laureate of the President of Russia's research grant as a member of a group of the CC RAS scientists |
| 2008 – 2010 | Laureate of the M.V. Keldysh Scholarship of the Department of Physics, MSU |
| 2008 | Participation in the ASTRON/JIVE Summer Student Programme, Dwingeloo, The Netherlands |
| 2008 | German Academic Exchange Service (DAAD) scholarship winner Participation in the Summer School at the FU Berlin, Germany |

LANGUAGES

Russian: native, **English:** fluent, **Dutch:** intermediate, **German:** intermediate