

## Ivan S. Grudinin, Ph.D.

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### Expertise

Research in nonlinear and quantum optics with microresonators, development of new technology. Full research cycle from proposal writing to presentation of results. Design and implementation of experimental projects, supporting theoretical models, numerical analysis and optimization. Development of proof-of-principle prototypes. Small team management.

### Skills

- Quantum and nonlinear optics, cavity optomechanics
- Optical microresonators: whispering gallery, microtoroids, photonic belt, crystalline and amorphous, THz/RF/polaritonic/plasmonic hybrid structures
- Frequency standards, WGM laser stabilization, atomic/optical clocks
- Microresonator Kerr frequency combs, dispersion engineering.
- UV, visible, IR, mid-IR and THZ optics
- Photolithography, UV/ozone cleaning, solgel, laser reflow, diamond turning
- Custom fiber and free beam optics design and optimization
- Supercomputing with MPI.
- C++, Java, Maple, Labview, LAMP, web design, virtual server
- Imaging/lens design and optimization (KDP-2, Code V)
- FEM (Comsol, FreeFem++), FDTD (meep), anisotropic ray tracing (Matlab)
- Analog and digital electronics design to support lab experiments
- Cryogenic and vacuum equipment - design and operation
- Design and fabrication of hardware for the experiments, machine shop skills
- Publishing and data presentation: LaTeX, MS Office, Origin, SciDavis.
- Basic German, fluent English, native Russian speaker.

### Education

- 2008 Ph.D., Physics, California Institute of Technology  
*Crystalline whispering gallery mode resonators for quantum and nonlinear optics*
- 2003 M.S., Physics, M.V. Lomonosov Moscow State University  
*Molecular Physics and Quantum Measurements.*  
R.V. Khokhlov award for the best student experimental research project.

### Employment

- 2011-present Research Technologist (staff), Communications Architectures and Research (332J), Quantum Science and Technology group, JPL
- 2008-2011 Postdoctoral researcher, Prof. K.J. Vahala group, Caltech
- 2003-2008 Associate member of technical staff, Quantum Science and Technology Group, Jet Propulsion Laboratory (JPL). Caltech Physics graduate student.
- 2003-2004 Research and teaching assistant, Thermal Noise Interferometer Group, LIGO, Caltech.
- 1997-2003 Research Student, Physics Department, Moscow State University, Russia.