

Alexei S. Lagoutchev,  
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**Objectives:**

- Experimental researcher in the field of nonlinear spectroscopy, its applications to studies of the adsorbed species and real-time monitoring of interfacial layers.
- Designer of high intensity laser probes, associated development of ultra-short pulsed laser sources, light frequency converters, modular setups for nonlinear spectroscopy, experimental cells and high sensitivity light detection equipment.

**Education:**

Ph.D. "Candidate in physics/mathematics" degree, 1992  
Institute of General physics, Moscow, Russia.

M.S.-Physics, Physics Department of the Moscow 1982  
State University, Moscow, Russia.

**Work experience:**

Research Associate, Department of Chemistry, 09/97-current  
University of Illinois at Urbana-Champaign.

Experimental femtosecond sum-frequency generation spectroscopy studies,  
spectroscopical and electrochemical cell design, Ti:Sapphire and OPA  
femtosecond laser installation design and maintenance.

Postdoctoral Visiting Associate, Institute of 12/93-07/97  
Atomic and Molecular Sciences,  
Academia Sinica, Taipei, Taiwan.

Experimental picosecond sum-frequency generation spectroscopy studies.  
Picosecond laser and OPA installation design and maintenance. Modelling  
molecular vibrations with Gaussian package.

Senior Scientific Associate, Heterophase Optical 03/82-12/93  
Processes Laboratory, Institute of General Physics,  
Russian Academy of Sciences.

Laser-assisted gas mixture isotopic separation in capillaries, tunable CO<sub>2</sub> and CO  
laser design, mass-spectroscopic monitoring of gas flows, vacuum cell design.

Part Time Teaching Assistant, Mathematics, 09/85-07/86  
Moscow College for Communication Systems.  
Teaching mathematics to undergraduates.

Graduate student, General Physics and Wave 01/79-03/82  
Processes Department, School of Physics,  
Moscow State University.

Computer simulation of laser beam propagation in the atmosphere in the presence  
of random wind.

**Major Skills and Strengths:**

- experimental nonlinear spectroscopy, spectroscopical fluid;
- vacuum and electrochemical cell design;
- designing and building nonlinear optical installations with laser and OPA sources;
- data collection and positioning automation;
- data analysis and computer modeling;
- experimental group leadership;
- teaching on graduate and undergraduate levels;
- CAD mechanical design and working with machine shops;
- close familiarity with electronics, supervising circuit design by engineers;
- excellent communication abilities and conflict resolution skills;
- language skills: English - fluent, Russian - native, German - reading.

**Publications (33 in total):**

1. **Alexei Lagutchev**, Aaron Lozano, Prabuddha Mukherjee, Selezion A. Hambir, Dana D. Dlott. Compact broadband vibrational sum-frequency generation spectrometer with nonresonant suppression. *Spectrochimica Acta, Part A: Molecular and Biomolecular Spectroscopy*, 2010, Vol. 75A(4), pp. 1289-1296.
2. Scott K. Shaw, **Alexei Lagutchev**, Dana D. Dlott, Andrew A Gewirth. Sum-Frequency Spectroscopy of Molecular Adsorbates on Low-Index Ag Surfaces: Effects of Azimuthal Rotation. *Analytical Chemistry*, 2009, Vol. 81(3), pp. 1154-1161.
3. **Alexei Lagutchev**, Selezion A. Hambir, and Dana D. Dlott. Nonresonant Background Suppression in Broadband Vibrational Sum-Frequency Generation Spectroscopy. *Journal of Physical Chemistry C*, 2007, Vol. 111(37), pp. 13645-13647.
4. Zhaohui Wang, Jeffrey A. Carter, **Alexei Lagutchev**, Yee Kan Koh, Nak-Hyun Seong, David G. Cahill, Dana D. Dlott. Ultrafast Flash Thermal Conductance of Molecular Chains. *Science*, 2007, Vol. 317, pp. 787-790.
5. **Lagutchev, A.**; Lu, G. Q.; Takeshita, T.; Dlott, Dana D.; Wieckowski, A. Vibrational sum frequency generation studies of the  $(2 \times 2) \rightarrow (\sqrt{19} \times \sqrt{19})$  phase transition of CO on Pt(111) electrodes. *Journal of Chemical Physics*, 2006, Vol. 125(15), 154705/1-154705/10.
6. Kim, Hackjin; **Lagutchev, Alexei**; Dlott, Dana D. Surface and interface spectroscopy of high explosives and binders: HMX and estane. *Propellants, Explosives, Pyrotechnics*, 2006, Vol. 31(2), pp. 116-123.
7. G.Q. Lu, **A. Lagutchev**, Dana D. Dlott, A. Wieckowski. Quantitative vibrational sum-frequency generation spectroscopy of thin layer electrochemistry: CO on a Pt electrode. *Surface Science*, 2005, Vol. 585, pp. 3-16.
8. **Alexei S. Lagutchev**, James E. Patterson, Wentao Huang and Dana D. Dlott. Ultrafast Dynamics of Self-Assembled Monolayers Under Shock Compression: Effects of molecular and substrate structure. *J. Phys. Chem. B*, 2005, Vol. 109, pp. 5033-5044.

**Conferences (27 in total):**

1. **Alexei Lagutchev**. Tunable IR pulse generation with optical parametric amplifiers. 5th Annual Chautauqua on Nonlinear Optics, West Lafayette, IN, June 28-July 2, 2010.
2. **Alexei Lagutchev**. Challenge of estimating optical field in monomolecular film adsorbed on metal surface. Nano-Optics and Plasmonics Conference, Gaithersburg, MD, April 19-22, 2010.
3. **Alexei Lagutchev**. Experimental issues in detection of weak light signals. 4th Annual Chautauqua on Nonlinear Optics, West Lafayette, IN, June 1-5, 2009.
4. **Alexei Lagutchev**, Guo-Qiang Lu, Tomohiro Takeshita, Rachel Behrens, Andrzej Wieckowski and Dana Dlott. Probing Buried Electrochemical Interfaces with Multiplex Broadband Sum Frequency Generation Spectroscopy. 62nd International Symposium on Molecular Spectroscopy, The Ohio State University, Columbus, USA, June 2007.
5. **Alexei Lagutchev** and William Clark. Nonlinear Femtosecond Vibrational Spectrometer. 62nd International Symposium on Molecular Spectroscopy, The Ohio State University, Columbus, USA, June 2007.
6. **Alexei S. Lagutchev**, James E. Patterson, Wen-Tao Huang, Guo-Qiang Lu, Andrzej Wieckowski, Dana D. Dlott. Real-Time Monitoring of Surface Layers by Sum-Frequency Generation Spectroscopy. Gordon Research Conference on Multiphoton Processes, Tilton, New Hampshire, USA, June 2006.

**Immigration status:** permanent resident of USA (green card holder).

**Professional societies:** American Physical Society;  
Optical Society of America, Senior Member

**Hobbies:** nordic skiing, sailing, photography.

**References:** available on request