

Andrei Piryatinski

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Education:

December 1997 ***Ph. D. in Physics***
Department of Physics and Astronomy, the University of Toledo,
Toledo, OH.

*Thesis: Nonlinear Absorption and Luminescence in Organic
Molecular Crystals*

June 1992 ***M. S. in Physics***
Department of Physics, Kiev State University, Kiev, Ukraine.

*Thesis: Light Self-Diffraction on Impurity Centers in Cubic
Crystals*

Research Interests:

- ***Quantum optics and plasmonics:*** Theory of strongly coupled quantum emitters such as semiconductor heterostructures and/or organic chromophores in optical and plasmonic cavities. Critical cavity polariton dynamics, BEC, superradiance, lasing. Quantum photon emission and scattering properties, entanglement production and control.
- ***Electronic and Vibrational Processes in Semiconductor, Metal, and Molecular Nanostructures:*** Ultrafast electronic and vibrational dynamics in semiconductor and/or metal nanostructures, carbon nano-tubes, macromolecules, molecular aggregates, molecular crystals. Photoinduced multiexciton processes in semiconductor nanostructures, with applications to lasing and photovoltaic materials. Nonadiabatic quantum mechanical/semiclassical molecular dynamics in the vicinity of electronic surface crossings, and induced photophysics in biomolecules and organo-metallic complexes.
- ***Ultrafast Nonlinear (Multidimensional) Spectroscopies:*** Theoretical investigation of nonlinear (multidimensional) spectroscopic signatures of photoexcited electronic and vibrational dynamics (structural and environmental fluctuations) in semiconductor, metal, and molecular nanostructures. Simulations of resonant optical, IR, and Raman four-wave-, and six-wave-mixing responses from nanostructures.

Professional Experience:

- March 2006 – Present **Technical Staff Member**, Physics of Condensed Matter and Complex Systems Group, Theoretical Division, Los Alamos National Laboratory, Los Alamos, NM.
- Sept. 2002 – March 2006 **Postdoctoral Research Associate**, Center for Nonlinear Studies, and Theoretical Chemistry & Molecular Physics Group, Theoretical Division, Los Alamos National Laboratory, Los Alamos, NM.
- Sept. 2000 – Aug. 2002 **Research Associate**, Institute for Theoretical Chemistry, Department of Chemistry, University of Wisconsin-Madison, Madison, WI.
- Dec. 1997 – Aug. 2000 **Postdoctoral Fellow**, Department of Chemistry, University of Rochester, NY.
- Sept. 1993 – Dec. 1997 **Research/Teaching Assistant**. Department of Physics and Astronomy, University of Toledo, OH.
- Sept. 1992 – Aug. 1993 **Research Assistant** Laboratory of Laser Spectroscopy, Institute for Semiconductor Physics, Ukrainian Academy of Sciences, Kiev, Ukraine.

Mentoring Experience:

- Sept. 1993 – Dec. 1997 **Department of Physics and Astronomy, University of Toledo:** Calculus based recitation and lab section in physics for natural science students and engineers.
- 2004 – present **Los Alamos National Laboratory:** Mentoring GRA students and postdocs. Total 5 postdocs. Co-advisor on one Ph.D. thesis.

Professional activities and memberships:

- **Member** of American Physical Society (APS).
- *Adjuncts Professor, Department of Physics, University of New Mexico*
- *Affiliated Scientist at the Center for Integrated Nanotechnologies (CINT), LANL*
- **Co-organizer:** “Arizona / Los Alamos Days 2003” joint University of Arizona and Center for Nonlinear Studies (Los Alamos National Laboratory) annual workshop. Tucson (Arizona), February 2003.
- **Co-Organizer:** “Quantum and Semiclassical Molecular Dynamics of Nanostructures” Center for Nonlinear Studies workshop, Los Alamos, July 15-17, 2004.

- **Co-Organizer:** “2009 Workshop on Wave Function Engineering and Coherent Control in Nanostructured Materials” Center for Nonlinear Studies & Center for Integrated Nanotechnologies, Los Alamos, February 25-27, 2009.
- **Co-Organizer:** “Non-Equilibrium Statistical Physics: from molecular materials to theoretical engineering. Honoring Professor Vladimir Chernyak 60th Birthday” Telluride, CO July 4-8, 2016.
- **Co-Organizer:** “Exciton-Photon Interactions for quantum systems” Telluride, CO June 10-14, 2019.
- **Co-Organizer:** “Exciton-Photon Interactions for quantum systems” Telluride, CO June 10-14, 2021.
- **Organizing Committee:** 2020 Conference on Excited State Processes (LANL, CNLS Sponsored) Santa Fe NM June 8-11, 2020.
- **Coordinator:** Center for Nonlinear Studies (Los Alamos National Laboratory) Colloquium Series. September 2003 – October 2004, October 2006 – 2008.
- **Refereeing for journals:** Physical Review Letters, Physical Review B, Physics Letters A, Chemical Physics Letters, Journal of Chemical Physics, Journal of Physical Chemistry, Nano Letters.
- **Refereeing for funding agencies:** LANL LDRD, National Science Foundation (NSF), Israeli Science Foundation

Honors and awards:

2006 The Postdoctoral Distinguished Performance Honorable Mention, LANL.

References: Available upon request