

Sergei Tretiak

Theoretical Division, T-12, Mail Stop B268, Los Alamos National Laboratory, Los Alamos, NM 87545
 Phone: (505) 667-8351, Fax: (505) 665-3909, E-mail: serg@lanl.gov
 Web: <http://www.t12.lanl.gov/home/serg>

Personal:

Citizenship: Russia

Status in the USA: Permanent Resident

Marital Status: Married with two children

Education:

1998 Ph.D. in Chemistry, University of Rochester (Rochester, NY); Advisor: Prof. Shaul Mukamel
 1994 M.S. in Physics (Highest Honors), Institute of Physics and Technology (Moscow, Russia)

Professional experience:

2001 – Present	Technical Staff Member, Theoretical Division, LANL
2005 – Present	Staff Scientist, Center for Integrated Nanotechnologies (CINT), LANL/SNL
2006 – 2007	CNRS invited professor position, UMR 6510, University of Rennes, France
1999 – 2001	Director's Postdoctoral Fellow, Theoretical Division, LANL
1998 – 1999	Postdoctoral Associate, University of Rochester (Rochester, NY)
1994 – 1998	Graduate Student, University of Rochester (Rochester, NY)
1991 – 1994	Graduate Student, Institute of Spectroscopy of Russian Academy of Sciences

Research interests:

Relation between optical and chemical properties of organic and semiconductor materials; Development of modern computational methods for molecular optical properties; time-dependent density functional theory and semiempirical methods; Nonlinear optical response of organic chromophores; Adiabatic and non-adiabatic molecular dynamics of the excited states; Collective electronic excitations and optical response of confined excitons in conjugated polymers, carbon nanotubes, semiconductor nanoparticles, and molecular aggregates; Charge and energy transfer in biological and artificial antenna complexes; Ultrafast nonlinear spectroscopy; Nonlinear dynamics of complex classical and quantum systems.

Awards and Honors:

Slansky Fellow Award (2001), LANL Director's Postdoctoral Fellow (1999-2001), Arnold Weissberger Fellow (1997-1998), Graduate Student Award in Computational Chemistry (1996), Elon Huntington Hooker Fellow (1996-1997), Sherman Clarke Fellow (1996-1997), Diploma with Honor, Moscow Institute of Physics and Technology (1994).

Professional service

- Organizer of the conferences in the Center for Nonlinear Studies (CNLS) at LANL: "*Excited State Processes in Electronic and Bio Nanomaterials (ESP)*", 2001, 2003, 2005, 2007;
- Organizer of Telluride workshop on "*Nonequilibrium Phenomena, Nonadiabatic Dynamics and Spectroscopy*", Telluride, CO, 2007;
- Organizer of the CNLS Conference "*Electronic and Vibrational Interactions in Carbon Nanotubes*", Santa Fe, NM, 2006;
- Organizer of the 24th CNLS Annual Conference "*Statistical Physics of Macromolecules: from electronic structure to fluid mechanics*", Santa Fe, NM, 2004;
- Manager of the Theoretical Division P/T Colloquium, Los Alamos National Laboratory, 2001-2005;
- Member of LANL Postdoctoral Committee, Los Alamos National Laboratory, 2006-present;
- Member of LDRD-ER review committee in Chemistry and Materials category (2005), in Technology category (2004), Los Alamos National Laboratory, 2005;
- Member of CNLS Executive Committee, Los Alamos National Laboratory, 2004-present;
- Member of CNLS public service committee, Los Alamos National Laboratory, 2001- 2003;
- Reviewer for about 20 major peer-reviewed journals and several funding agencies (NSF, Petroleum Research Fund (ACS), DOE BES, US Department of State for the Science Centers, etc.);
- Affiliations ACS/APS/MRS.

Training and mentoring of junior researchers:

Supervised 8 postdoctoral associates (A. Masunov, 2001-2004, currently junior faculty at USF, R. Magyar, 2003-2005, currently postdoc at NIST; A. Piryatinski, 2002-2006, currently TSM at LANL; S. Goupalov, 2003-2004, currently Postdoc at U. Utah; M. Lucero, 2005-2006, M. Galperin, 2007-present, J. Tao, 2007-present, S. Kilina, 2008-present) and mentored over 20 summer graduate/undergraduate students at T-12/CNLS

Current collaborations:

within LANL: V. Klimov, A. Shreve, D. Smith, R. L. Martin, A. Saxena, A. R. Bishop, G. Berman, S. D. Doorn, D. Dattelbaum, H.-L. Wang, S.D. McGrain, A.V. Balatsky, A. Piryatinski, M.C. Challacombe.

outside LANL: S. Mukamel (UC Irvine), G.C. Bazan (UC Santa Barbara), D. Alara (PennState U.), A. Myers-Kelley (UC Merced), J. Perry, (GaTech), J. Lupton (U. Utah), V. Chernyak (Wayne State U.), M. Blanchard-Desce (U. Rennes), F. Furche (U. Karlsruhe), O. Prezhdo (U. Washington), G. Lanzani (Politecnico di Milano), G.D. Scholes (U. Toronto), A. Jorio (U. Federal de Minas Gerais, Brazil).

Selected invited talks (out of about 50):

Molecular Photonics, Friday Harbor, WA (2007); Telluride Workshop, CO (2007); Gordon Research Conference on TDDFT (2007); 233th ACS National Meeting, Chicago, IL, (2007); ICCMSE 2006, Greece (2006); MIT Chemistry, MA (2006); Gordon Research Conference on Electronic Processes in Organic Materials (2006); International Symposium on Semiconducting Polymers, Taiwan (2006); PacificChem 2005, Honolulu, Hawaii (2005); Winter School in Theoretical Chemistry on Nanophotonics, University of Helsinki, Finland (2005); 230th ACS National Meeting, Washington DC (2005); Conference on Nonadiabatic Dynamics, Telluride (2004); Binational Consortium On Nonlinear Optics, UA (2004); The Third International Symposium on Optical Power Limiting, Arizona (2003); ACS National Meeting, New Orleans (2003); Gordon Research Conference on Computational Chemistry, New London (2002); MRS National Meeting, Boston (2001); ACS National Meeting, San Diego (2001).

Selected publications (out of about 90 - cited about 2000 times):

- 1 S. Kilina and S. Tretiak, "Excitonic and vibrational properties of single-walled semiconducting carbon nanotubes", *Adv. Func. Mat. (Feature Article, journal cover page)* **17**, 3405-3420 (2007).
- 2 S. Tretiak, "Triplet absorption in carbon nanotubes: a TD-DFT study," *Nano Letters (journal cover page)*, **7**, 2201-2206 (2007).
- 3 A.P. Shreve, E.H. Haroz, S.M. Bachilo, R.B. Weisman, S. Tretiak, S. Kilina, and S.K. Doorn, "Determination of Exciton-Phonon Coupling Elements in Single-Walled Carbon Nanotubes by Raman Overtone Analysis", *Phys. Rev. Lett.*, **98**, 037405 (2007).
- 4 S. Tretiak, S. Kilina, A.Piryatinski, A. Saxena, R.L.Martin and A.R. Bishop, "Excitons and Peierls distortion in conjugated carbon nanotubes," *Nano Letters*, **7**, 86 - 92 (2007).
- 5 C. Wu, S. Malinin, S. Tretiak, and V. Chernyak, "Exciton scattering and localization in branched dendrimeric structures," *Nature Physics* **2**, 631-635 (2006).
- 6 A. Gambetta, C. Manzoni, E. Menna, G. Cerullo, G. Lanzani, S. Tretiak, A.Piryatinski, A. Saxena, R.L. Martin and A.R. Bishop, "Real time observation of non-linear vibrational dynamics in semiconducting single wall carbon nanotubes," *Nature Physics* **2**, 515-520 (2006).
- 7 A. Masunov and S. Tretiak, "Prediction of two photon absorption properties for the large organic molecules using the time-dependent density functional theory," *J. Phys. Chem. B*, **108**, 899 (2004).
- 8 S. Tretiak, R.L. Martin, A. Saxena, A.R. Bishop, "Photoexcited breathers in conjugated polyenes: an excited state molecular dynamics study," *Proc. Natl. Acad. Sci. USA*, **100**, 2185 (2003).
- 9 S. Tretiak and S. Mukamel, "Density matrix analysis and simulation of electronic excitations in conjugated and aggregated molecules," *Chem. Rev.*, **102**, 3171 (2002).
- 10 S. Tretiak, A. Saxena, R. L. Martin, and A. R. Bishop, "Conformational dynamics of photoexcited conjugated molecules," *Phys. Rev. Lett.*, **89**, 97402 (2002).
- 11 S. Mukamel, S. Tretiak, Th. Wagersreiter, and V. Chernyak, "Electronic coherence and collective optical excitations of conjugated molecules," *Science*, **277**, 781 (1997).
- 12 S. Tretiak, V. Chernyak, and S. Mukamel, "Chemical bonding and size scaling of nonlinear polarizabilities of conjugated polymers," *Phys. Rev. Lett.*, **77**, 4656 (1996).