

SERGEI TRETIAK

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Education

- 1999 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)

Appointments

- 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
1999 – 1999 Postdoctoral Associate, University of Rochester (Rochester, NY)
1994 – 1999 Graduate Student, University of Rochester (Rochester, NY)
1991 – 1994 Graduate Student, Institute of Spectroscopy of Russian Academy of Sciences

Publications

1. S. Kilina, S. Ivanov, and S. Tretiak "Effect of Surface Ligands on Optical and Electronic Spectra of Semiconductor Nanoclusters", *J. Am. Chem. Soc.*, **131**, 7717 – 7726 (2009)
2. F. Terenziani, C. Katan, M. Blanchard-Desce, E. Badaeva, and S. Tretiak, "Enhanced two-photon absorption of organic chromophores: theoretical and experimental assessments", *Adv. Mat.* (Review Article, journal cover page) **20**, 1-38 (2008).
3. C. Wu, S. Malinin, S. Tretiak, V. Chernyak, "Multiscale modeling of electronic excitations in branched conjugated molecules using exciton scattering approach," *Phys. Rev. Lett.* **100**, 057405 (2008).
4. S. Kilina, S. Tretiak, S.K. Doorn, Z. Luo, A. Piryatinski, A. Saxena, R.L. Martin, and A.R. Bishop, "Cross-polarized Excitons of Carbon Nanotubes", *Proc. Nat. Acad. Sci. USA*, **105**, 6797 (2008).
5. S. Tretiak, "Triplet absorption in carbon nanotubes: a TD-DFT study," *Nano Letters* (journal cover page), **7**, 2201-2206 (2007).
6. C. Wu, S. Malinin, S. Tretiak, and V. Chernyak, "Exciton scattering and localization in branched dendrimeric structures," *Nature Physics* **2**, 631-635 (2006).
7. 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).
8. S. A. Crooker, J. Hollingsworth, S. Tretiak, and V. I. Klimov, "Spectrally resolved dynamics of energy transfer in quantum-dot assemblies: Towards engineered energy flows in artificial materials," *Phys. Rev. Lett.*, **89**, 6802-6802 (2002).
9. S. Tretiak, A. Saxena, R. L. Martin, and A. R. Bishop, "Conformational dynamics of photoexcited conjugated molecules," *Phys. Rev. Lett.*, **89**, 97402 (2002).
10. S. Tretiak and S. Mukamel, "Density matrix analysis and simulation of electronic excitations in conjugated and aggregated molecules," *Chem. Rev.*, **102**, 3171 (2002).

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).

Collaborators: *within LANL*: V. Klimov, A. Shreve, D. Smith, R. L. Martin, A. Saxena, A. R. Bishop, S. D. Doorn, H.-L. Wang, A.V. Balatsky, A. Piryatinski, M.C. Challacombe, M. Sykora, S. Ivanov, A. Taylor. *outside LANL*: J. Perry (GaTech), J. Lupton (U. Utah), V. Chernyak (Wayne State U.), M. Blanchard-Desce (U. Rennes), G. Lanzani (Politecnico di Milano), G.D. Scholes (U. Toronto), A. Jorio (U. Federal de Minas Gerais, Brazil), S. Kußmelm (Max Plank), G. Bazan (UCSB), A. Roitberg (U. Florida).

Graduate and Postdoctoral Advisors:

Ph.D. Advisor: Prof. Shaul Mukamel (UC Irvine)

Postdoc Advisor: Dr. Alan Bishop (LANL)

Thesis Advisor and Postgraduate – Scholar Sponsor: Supervised 8 postdoctoral associates/fellows and mentored over 25 graduate students at LANL (T-1/CNLS) *Postdoc Advisees*: A. Masunov, 2001-2004, currently faculty at UCF, R. Magyar, 2003-2005, currently TSM at SNL; A. Piryatinski, 2002-2006, currently TSM at LANL; S. Goupalov, 2003-2004, currently faculty at JSU; M. Lucero, 2005-2006, M. Galperin, 2007-2008, currently faculty at UC San Diego; J. Tao, 2007-present; S. Kilina, 2008-present. (*Under*)*Graduate Advisees*: S. Goel (UCF), A. Furmanchuk (Jackson State), J. Ramirez (UF), C. Thacker (UF), Hao Li (Wayne State), E. Badaeva (UW), Th. Koerzdoerfer (Max Plank, Germany), V. Albert (UF), S. Difley (MIT), K. Velizhanin (LANL), C. Wu (Notre Dame), S. Kilina (LANL), C. Isborn (CalTech), P. Yang (PNNL), S. Ponomarev (Wesleyan), S. Kurennoy (UC Santa Barbara), C. Craig (Western Washington), E. Heatwole (Humboldt), K. Igumenshchev (U. Rochester), I. Franco (Northwestern), N. Kobko (CUNY), A. Moran (UNC), T. Humble (U. Oregon)

Synergistic Activities

- 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, 2009;
- Organizer of the CNLS Conferences “*Electronic and Vibrational Interactions in Carbon Nanotubes*”, Santa Fe, NM, 2007, the 29th CNLS Annual Conference “*Energy for 21st century*”, Santa Fe, NM, 2009;
- Co-Organizer of Telluride workshop on “*Nonequilibrium Phenomena, Nonadiabatic Dynamics and Spectroscopy*”, Telluride, CO, 2007, 2009.
- Member of LANL Postdoctoral Committee, Los Alamos National Laboratory, 2006-2009; Member of LDRD-ER review committee in Quantum Science (2007), Chemistry and Materials category (2005), and Technology category (2004) at Los Alamos National Laboratory;
- 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.).

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.

Selected recent invited talks (out of ~80):

Optical probes (OP-2009), Beijing, (2009); 237th ACS National Meeting, Salt Lake City (2009); 92nd OSA National Meeting, Rochester (2008); 235th ACS National Meeting, New Orleans (2008); APS March Meeting, New Orleans (2008); 48th Sanibel Symposium, St. Simons (2008); Molecular Photonics, Friday Harbor, (2007); Telluride Workshop, CO (2007); Gordon Research Conference on TDDFT (2007); 233th ACS National Meeting, Chicago, (2007); ICCMSE 2006, Greece (2006); MIT Chemistry (2006); Gordon Research Conference on Electronic Processes in Organic Materials (2006); International Symposium on Semiconducting Polymers, Taiwan (2006); PacificChem 2005, Honolulu (2005); Winter School in Theoretical Chemistry on Nanophotonics, Helsinki (2005); 230th ACS National Meeting, Washington DC (2005).