

## Sergei Tretiak

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### **Personal:**

*Citizenship:* US *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 (Scientist Level 4)
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
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:**

LANL Fellows Prize (2010), 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 conference series at the Center for Nonlinear Studies (CNLS), LANL: "*Excited State Processes in Electronic and Bio Nanomaterials (ESP)*", 2001, 2003, 2005, 2007, 2009, 2011.
- Organizer of Telluride workshop on "*Nonequilibrium Phenomena, Nonadiabatic Dynamics and Spectroscopy*", Telluride, CO, 2007, 2009, 2011.
- Co-organizer of the session "Physical Chemistry of Interfaces and Nanomaterials" for the SPIE Nano Science and Engineering conference, San Diego, CA, 2007-2011.
- Organizer of the CNLS Conferences: "*Statistical Physics of Macromolecules: from electronic structure to fluid mechanics*", Santa Fe, NM, 2004; "*Electronic and Vibrational Interactions in Carbon Nanotubes*", Santa Fe, NM, 2007; "*Energy for 21<sup>st</sup> century*", Santa Fe, NM, 2009.
- Manager of the Theoretical Division P/T Colloquium, Los Alamos National Laboratory, 2001-2005;
- Member of LANL Postdoctoral Committee, Los Alamos National Laboratory, 2006-2009.
- Member of LDRD-ER review committee in Chemistry and Materials category (2005), in Technology category (2004), Los Alamos National Laboratory.
- Member of CNLS Executive Committee, Los Alamos National Laboratory, 2004-present.
- 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.).
- Member of Editorial Board Advances in Physical Chemistry,
- Affiliated with ACS/APS/MRS.

### **Mentoring of junior researchers:**

Supervised 10 postdoctoral associates (A. Masunov, 2001-2004, currently faculty at USF, 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, 2007-2010, currently faculty at Tulane University; S. Kilina, 2008-2010, currently faculty at NDSU,

K. Velizhanin, 2010-2012, currently TSM at LANL; H. Li (2011-present), A. Zhugayevich (2011-present), and mentored over 40 summer GRA students at T-1/CNLS

### Current collaborations:

*within LANL:* V. Klimov, D. L. Smith, R. L. Martin, A. Saxena, A. R. Bishop, B. Crone, S.K. Doorn, H. Htoon, D. Dattelbaum, H.L. Wang, S.D. McGrain, A.V. Balatsky, A. Piryatinski, D. Mozyrsky.

*outside LANL:* S. Mukamel (UC Irvine), G.C. Bazan (UC Santa Barbara), 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), A. Shreve (UNM).

### Selected recent invited and keynote talks (out of about 120):

243th ACS National Meeting, San Diego, CA (2012), 52th Sanibel Symposium, St. Simons, GA (2012), 242th ACS National Meeting, Denver, CO (2011), PacifiChem, Honolulu HI (2010); CCTCC-19, Jackson, MS, (2010); Raman Spectroscopy (ICORS-2010), Boston, MA, (2010); CECAM, Ireland, (2010); Optical probes (OP-2009), Beijing, (2009); 237th ACS National Meeting, Salt Lake City (2009); Telluride Workshop, CO (2007, 2009, 2011); MIT (2009, 2006); 92<sup>nd</sup> OSA National Meeting, Rochester (2008); 235th ACS National Meeting, New Orleans (2008); APS March Meeting, New Orleans (2008); 48th Sanibel Symposium, St. Simons (2008).

### Relevant Publications (out of ~140, citation index ~4200, H-index 36)

Current citation metric (public): <http://www.researcherid.com/rid/B-5556-2009>

- 1 J. Clark, T. Nelson, S. Tretiak, G. Cirmi, and G. Lanzani, "Femtosecond Torsional Relaxation", *Nature Physics*, **8**, 225-231 (2012).  
Featured in: *News & Views, Nature Physics* 8, 179 (2012) 'A lightning-fast change'
- 2 T. Nelson, S. F. Alberti, V. Chernyak, A. Roitberg, and S. Tretiak, "The NA-ESMD modeling of photoinduced dynamics in conjugated molecules", *J. Phys. Chem. B*, **115**, 5402 (2011).
- 3 S. Kilina, E. Badaeva, S. Tretiak, A. Piryatinski, A. Saxena, and A.R. Bishop, "Bright and Dark Excitons in Semiconductor Carbon Nanotubes: Insights from electronic structure calculations", *Phys. Chem. Chem. Phys.* (journal cover page) **21**, 4113 - 4123 (2009).
- 4 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).
- 5 C. Wu, S. Malinin, S. Tretiak, and V. Chernyak, "Multiscale modeling of electronic excitations in branched molecules using exciton scattering approach," *Phys. Rev. Lett.* **100**, 057405 (2008).
- 6 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).
- 7 S. Tretiak, "Triplet absorption in carbon nanotubes: a TD-DFT study," *Nano Letters* (journal cover page), **7**, 2201-2206 (2007).
- 8 C. Wu, S. Malinin, S. Tretiak, and V. Chernyak, "Exciton scattering and localization in branched dendrimeric structures," *Nature Physics* **2**, 631-635 (2006).  
Featured in: *News & Views, Nature Physics* 2, 591 (2006) 'Simplifying organic complexity'
- 9 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).
- 10 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).
- 11 S. Tretiak, A. Saxena, R. L. Martin, and A. R. Bishop, "Conformational dynamics of photoexcited conjugated molecules," *Phys. Rev. Lett.*, **89**, 97402 (2002).
- 12 S. Tretiak and S. Mukamel, "Density matrix analysis and simulation of electronic excitations in conjugated and aggregated molecules," *Chem. Rev.*, **102**, 3171 (2002).
- 13 S. Mukamel, S. Tretiak, Th. Wagersreiter, and V. Chernyak, "Electronic coherence and collective optical excitations of conjugated molecules," *Science*, **277**, 781 (1997).