

## Seogjoo Jang, Ph.D.

### Contact Information:

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**Citizenship:** South Korea

**Immigration status:** Permanent Resident, USA

### Employment:

Assistant Professor (Sep. 2005 - Present )  
Department of Chemistry and Biochemistry  
Queens College, City University of New York

### Other positions:

Doctoral Faculty  
Department of Chemistry (Oct. 2005 - Present)  
Department of Physics (Jan. 2009 - Present)  
Graduate Center, City University of New York  
Guest Scientist (Sep. 2005 - Present)  
Brookhaven National Laboratory, Upton, NY

### Education

University of Pennsylvania (July 1995 - Dec. 1999)	Philadelphia, PA
Ph.D., Theoretical Physical Chemistry	
Georgia Institute of Technology (Sep. 1994 - June 1995)	Atlanta, GA
Graduate program in physical chemistry, graduate courseworks in physics	
Seoul National University (Mar. 1989 - Aug. 1993)	Seoul, Korea
MS, Theoretical Physical Chemistry (Leave of absence due to military service, 1990-1992)	
Seoul National University (Mar. 1985 - Feb. 1989)	Seoul, Korea
BS, Chemistry; Physics courses: 35 credits; Mathematics courses: 33 credits	

### Experience

Brookhaven National Laboratory (Jan. 2003 - Aug. 2005)	Upton, NY
Goldhaber Distinguished Fellow	
Massachusetts Institute of Technology (Nov. 1999 - Dec. 2002)	Cambridge, MA
Postdoctoral Fellow/Associate	
Korean Military Service (Oct. 1990 - Mar. 1992)	Seoul, Korea

### Awards

Faculty Early Career Development Award (2009 - 2014)	National Science Foundation
Goldhaber Distinguished Fellowship (2003 - 2005)	Brookhaven National Lab.
Chairman's Award for academic excellence (1996)	University of Pennsylvania

### Recent Publications (Sep. 2005 - Present)

1. **Seogjoo Jang**, "Theory of coherent resonance energy transfer for coherent initial condition," *Journal of Chemical Physics*, *accepted* (2009)
2. **Seogjoo Jang**, Yuan-Chung Cheng, David R. Reichman, and Joel D. Eaves, "Theory of coherent resonance energy transfer," *Journal of Chemical Physics* **129**, 101104 (2008)
3. Vijayakumar Ramalingam, Maciej E. Domaradzki, **Seogjoo Jang**, and Rajeev S. Muthyala, "Carbonyl groups as molecular valves to regulate chloride binding to squaramides," *Organic Letters* **10**, 3315 (2008)
4. **Seogjoo Jang**, "Generalization of the Förster resonance energy transfer theory for quantum mechanical modulation of the donor-acceptor coupling," *Journal of Chemical Physics* **127**, 174710 (2007)
5. **Seogjoo Jang**, Marshall D. Newton, and Robert J. Silbey, "Multichromophoric Förster resonance energy transfer from B800 to B850 in the light harvesting complex 2: Evidence for subtle energetic optimization by purple bacteria," *Journal of Physical Chemistry B* **111**, 6807 (2007)
6. **Seogjoo Jang** and Marshall D. Newton, "Closed form expressions of quantum electron transfer rate based on the stationary phase approximation," *Journal of Physical Chemistry B* **110**, 18996 (2006)
7. **Seogjoo Jang**, "Path-integral centroid dynamics for general initial conditions: A nonequilibrium projection operator formulation," *Journal of Chemical Physics* **124**, 064107 (2006)

## Current Research Support

1. **Seogjoo Jang**, "Theoretical modeling of the pump-probe anisotropy of coherent resonance energy transfer dynamics," PSC-CUNY grant; July 2009 - June 2010 (\$2,930)
2. **Seogjoo Jang**, "Coarse-grained computational modeling of conjugated polymers," Research Enhancement Grant, Queens College; July 2009 - June 2010 (\$11,000)
3. **Seogjoo Jang**, "Coarse-grained computational modeling of conjugated polymers at nanometer length scale," User Proposal for linux cluster in the Center for Functional Nanomaterials, Brookhaven National Laboratory; Sep. 2009 -Dec. 2009
4. **Seogjoo Jang**, "Computational modeling and theory development of charge flow dynamics in photosynthetic units and conjugated polymer systems," Department of Energy, Office of Basic Energy Sciences, Chemical Sciences Research Programs; Sep. 2009 - Aug. 2012 (\$247,473)
5. **Seogjoo Jang**, "Synergistic theory development and computational modeling of the energy flow dynamics in soft optoelectronic molecules," National Science Foundation, CAREER award; May 2009 - Apr. 2014 (\$600,000)
6. **Seogjoo Jang**, "Theoretical investigation on the microscopic basis of the two-state model of the excess electron in saturated hydrocarbon liquids based on path integral simulation," American Chemical Society Petroleum Research Foundation, Type G grant; July 2007 - Aug. 2010 (\$40,000)

## Past Research Support

1. **Seogjoo Jang**, "Theoretical development and application of path integral centroid methods for quantum dynamics simulation of condensed phase systems," PSC-CUNY grant; July 2008 - June 2009 (\$3,770)
2. **Seogjoo Jang**, "Feynman path integral simulation of an excess electron in hydrocarbon liquids," Research Enhancement Funding, Queens College; Nov. 2007 - May 2008 (\$15,000)
3. Zhonghua Yu and **Seogjoo Jang**, "Single Molecule Spectroscopy of Conjugated Organic Oligomers: A Joint Experimental and Theoretical Study," CUNY Collaborative Research Grant; Sep. 2006 -Aug. 2008 (\$40,000)
4. **Seogjoo Jang**, "Quantum dynamical modeling and computation of the charge transport through single DNA duplexes," PSC-CUNY grant; July 2006 - Dec. 2007 (\$2,600)

## Teaching

Seminar (Spring, 2006)	Graduate Center, CUNY
Introduction to Spectroscopy (Spring, 2006)	Graduate Center, CUNY
Physical Chemistry II(Spring, 2006)	Queens College, CUNY
Physical Chemistry II(Spring, 2007)	Queens College, CUNY
Seminar (Spring, 2007)	Queens College, CUNY
Introductory Quantum Chemistry (Fall, 2007)	Graduate Center, CUNY
Lectures on Spectroscopy (Spring, 2008)	Graduate Center, CUNY
Physical Chemistry I (Fall, 2008)	Queens College, CUNY
Seminar (Fall, 2008)	Queens College, CUNY
Physical Chemistry II (Spring, 2009)	Queens College, CUNY
Chemical Thermodynamics and Kinetics (Fall, 2009)	Queens College, CUNY

## Mentoring    Postdoctoral Researcher

Dr. Lei Yang, Queens College (Nov. 2008 - Present)

### Graduate Students

Marta Kowalczyk, Chemistry Graduate Student, Queens College (Jan. 2007 - Present)

Murali Devi, Physics Graduate Student, Queens College (Apr. 2008 - Present)

Xun Huang, Chemistry Graduate Student, Queens College (July 2009 - Present)

### Undergraduate and Master's Students

Michael Kirschenbaum, Undergraduate Student, Queens College (Jan. 2006 - Dec. 2007)

Andres Montoya Castillo, Undergraduate Student, Honors College, CUNY (June 2007 -May 2009) & Master's program, Physics Department, Queens College, CUNY

Jin Bakalis, Chemistry Undergraduate Student, Queens College, CUNY (June 2009 - Present)

Alexis Estrada, Chemistry Undergraduate Student, Queens College, CUNY (June 2009 - Present)

Daniel Sangobawno, Chemistry Undergraduate Student, Queens borough Community College, CUNY (June 2009 - Present)

### High School Students

Michael Kaplan, Bronx High School (Jan. 2007 -Jan. 2009)

Cheska Hong, Great Neck High School (July 2009 - Present)

## PhD Dissertation Committee

Luxi Li, Queens College, Mentor: Cherice Evans (Spring, 2006 - Present)

Xianbo Shi, Queens College, Mentor: Cherice Evans (Spring, 2006 - Present)

Saliha Aite, City College, Mentor: Zhonghua Yu (Fall, 2006)

Marta Kowalczyk, Queens College, Mentors: Seogjoo Jang and Harry Gafney (Spring, 2008 - Present)

## Invited Talks and Seminars (Sep. 2005 - Present)

1. Conference on Quantum Information and Quantum Control, Fields Institute, Toronto (Aug. 2009)
2. Brooklyn College, CUNY, Brooklyn, NY (Apr. 2008)
3. Graduate Center, CUNY, New York, NY (June 2007)
4. University of California at Riverside, Riverside, CA (Feb. 2007)
5. Queensborough Community College, Bayside, NY (Dec. 2006)
6. SUNY at Stonybrook, Stonybrook, NY (Oct. 2006)
7. City College, CUNY, New York, NY (Oct. 2006)
8. Yonsei University, Seoul, South Korea (Sep. 2006)
9. Korea University, Seoul, South Korea (Aug. 2006)
10. Seoul National University, Seoul, South Korea (Aug. 2006)
11. Pohang University of Science and Technology, Pohang, South Korea (Aug. 2006)

## Oral Presentations (Sep. 2005 - Present)

1. American Chemical Society National Meeting, Philadelphia (Aug. 2008)
2. American Chemical Society National Meeting, Boston (Aug. 2007)
3. American Chemical Society National Meeting, Atlanta (Mar. 2006)

## Workshop Participation (Sep. 2005 - Present)

1. Workshop on efficient conversion of solar energy to electricity and fuels: Critical research directions and tutorial, Boulder, Colorado (Aug. 2008)
2. Workshop on Multi-Teraflop Computing in Biology, Materials, and Energy Science, Stony Brook, SUNY (Sep. 2005)

## Invitational Review Activity (Sep. 2005 - Present)

1. The Journal of Chemical Physics
2. Physical Review B
3. The Journal of American Chemical Society
4. Physical Review Letters
5. PSC-CUNY grant proposals
6. NSF proposals
7. CUNY Collaborative grant proposals
8. Physical Chemistry textbook by Atkins and de Paula, 9th Edition, Freeman and Company
9. Physical Chemistry Chemical Physics, a journal of Royal Society of Chemistry

## Organization of Meetings (Sep. 2005 - Present)

1. Korean-American Math and Science Olympiad, Queens College (Nov. 2007 & 2008)
2. Workshop on Computation, Simulation, and Modeling of molecular processes, Graduate Center (2007- 2008)
3. "Computational chemistry for the health of humanity and the planet," 2008 mid-Atlantic regional meeting of the American Chemical Society, Queensborough community college (May 2008)

## Recent Synergistic Activities (Sep. 2005 - Present)

1. Deputy Chair, Department of Chemistry and Biochemistry, Queens College, CUNY (July 2009 - Present)
2. Personnel and Budget Committee, Department of Chemistry and Biochemistry, Queens College, CUNY (May 2009 - Present)
3. Executive Committee, Chemistry Graduate Program, City University of New York (May 2009 - Present)
4. Senior Vice President, New York Metro Chapter of Korean-American Scientists and Engineers Association (May 2009 - Present)
5. Chair, Topical group on Computers in Chemistry, New York Section of the American Chemical Society (Dec. 2008 - present)
6. Graduate Admission Committee (Mar. 2006 - Oct. 2008), Queens College, CUNY
7. Faculty Hiring Committee (2005, 2006), Queens College, CUNY
8. Academic Senate, Queens College, CUNY (2007 - 2008)
9. Organization of a CUNY theory meeting named ATaCCC (Association of Theoretical and Computational Chemists at CUNY) (2006-2008)
10. Soft Materials Steering Committee, the New York Academy of Sciences (2006 - Present)
11. Co-Chair, Computational Chemistry Program, 2008 mid-Atlantic regional meeting of the American Chemical Society

## Affiliations

American Chemical Society (2001 - )  
American Physics Society (2004 - 2006)  
American Association for the Advancement of Science (1999 - 2002, 2006 - )  
Referee for Physical Review Letters (2004 - )  
Referee for the Journal of Chemical Physics (2004 - )  
Referee for Physical Review B (2005 - )  
Sigma Xi, the Scientific Research Society (2006 - )

## Other Invited Seminars or Conference Presentation (Before Sep. 2005)

University of Central Florida, Orlando	Orlando, FL(Feb. 2005)
Queens College of the City University of New York	Queens, NY (Jan. 2005)
Boston College	Boston, MA (Jan. 2005)
Syracuse University	Syracuse, NY (Jan. 2005)
University of North Carolina, Charlotte	Charlotte, NC (Nov. 2004)
DOE solar photochemistry research conference	Airlie, VA (June 2004)

University of California, Davis	Davis, CA (Feb. 2004)
Illinois Institute of Technology	Chicago, IL (Jan. 2004)
Boston University	Boston, MA (Jan. 2004)
Virginia Polytechnic Institute	Blacksburg, VA (Jan. 2004)
Wayne State University	Detroit, MI (Dec. 2003)
ACS Meeting	New York, NY (Sep. 2003)
DOE solar photochemistry research conference	Tahoe City, CA (June 2003)
Electronic Processes in Organic Materials (Gordon Conference)	Newport, RI (Aug. 2002)
Brookhaven National Laboratory	Upton, NY (May 2002)
McMaster University	Hamilton, Canada (Jan. 2002)
University of Notre Dame	Notre Dame, IN (Dec. 2001)
Quantum Control (Gordon Conference)	Hadley, MA (July 2001)
American Conference on Theoretical Chemistry	Boulder, CO (July 1999)
West Coast Theoretical Chemistry Conference	Richland, WA (June 1998)
High Energy Density Matter Meeting	Monterey, CA (May 1998)
American Conference on Theoretical Chemistry	Park City, UT (July 1996)

### Other Workshop and Conference Participation (Before Sep. 2005)

Center for Functional Nanomaterials User's Meeting, BNL, NY (May 2004); International Workshop on Field Theory Methods in Correlated Nanoscale Systems, BNL, NY (Aug. 2003); ACS Meeting, Boston, MA (Sep. 2002); ACS Meeting, San Diego (Mar. 2001); Molecular Electronic Spectroscopy and Dynamics (Gordon Conference) New London, NH (July 2000); Time Dependent Quantum Dynamics Workshop, Brianhead, UT (Mar. 1999)

## Full Publications by Seogjoo Jang

- 31.\* **Seogjoo Jang**, “Theory of coherent resonance energy transfer for coherent initial condition,” *Journal of Chemical Physics*, *accepted* (2009)
- 30.\* **Seogjoo Jang**, Yuan-Chung Cheng, David R. Reichman, and Joel D. Eaves, “Theory of coherent resonance energy transfer,” *Journal of Chemical Physics* **129**, 101104 (2008)
- 29.\* Vijayakumar Ramalingam, Maciej E. Domaradzki, **Seogjoo Jang**, and Rajeev S. Muthyala, “Carbonyl groups as molecular valves to regulate chloride binding to squaramides,” *Organic Letters* **10**, 3315 (2008)
- 28.\* **Seogjoo Jang**, “Generalization of the Förster resonance energy transfer theory for quantum mechanical modulation of the donor-acceptor coupling,” *Journal of Chemical Physics* **127**, 174710 (2007)
- 27.\* **Seogjoo Jang**, Marshall D. Newton, and Robert J. Silbey, “Multichromophoric Förster resonance energy transfer from B800 to B850 in the light harvesting complex 2: Evidence for subtle energetic optimization by purple bacteria,” *Journal of Physical Chemistry B* **111**, 6807 (2007)
- 26.\* **Seogjoo Jang** and Marshall D. Newton; “Closed form expressions of quantum electron transfer rate based on the stationary phase approximation,” *Journal of Physical Chemistry B* **110**, 18996 (2006)
- 25.\* **Seogjoo Jang**; “Path-integral centroid dynamics for general initial conditions: A nonequilibrium projection operator formulation,” *Journal of Chemical Physics* **124**, 064107 (2006)
24. **Seogjoo Jang** and Marshall D. Newton; “Theory of torsional non-Condon electron transfer: A generalized spin-boson Hamiltonian and its nonadiabatic limit solution,” *Journal of Chemical Physics* **122**, 024501 (2005)
23. **Seogjoo Jang**, Marshall D. Newton, and Robert J. Silbey; “Multichromophoric Förster resonance energy transfer,” *Physical Review Letters* **92**, 218301 (2004)
22. Eitan Geva, **Seogjoo Jang**, and Gregory A. Voth; “Quantum Rate Theory: A Path Integral Centroid Perspective,” in *Encyclopedia of Materials Modeling: Vol. I, Fundamental Models and Methods*, S. Yip, Editor (Springer-Verlag, 2005)
21. **Seogjoo Jang** and Robert J. Silbey; “Single complex line shapes of the B850 band of LH2,” *Journal of Chemical Physics* **118**, 9324 (2003)
20. **Seogjoo Jang** and Robert J. Silbey; “Theory of single molecule line shapes of multichromophoric macromolecules,” *Journal of Chemical Physics* **118**, 9312 (2003)
19. **Seogjoo Jang** and Jianshu Cao ; “Optimal quantum control in dissipative environments : General formalism and perturbative limits,” in *Laser Control and Manipulation of Molecules (ACS Symposium Series)* **821**, 132 (2002)
18. **Seogjoo Jang**, Jianshu Cao, and Robert J. Silbey ; “On the temperature dependence of molecular line shapes due to linearly coupled phonon bands,” *Journal of Physical Chemistry B* **106**, 8313 (2002)
17. **Seogjoo Jang**, Jianshu Cao, and Robert J. Silbey ; “Fourth order quantum master equation and its Markovian bath limit,” *Journal of Chemical Physics* **116**, 2705 (2002); **117**, 10428 (2002)
16. **Seogjoo Jang**, Younjoon Jung, and Robert J. Silbey ; “Nonequilibrium generalization of Förster-Dexter theory for excitation energy transfer,” *Chemical Physics* **275**, 319 (2002)
15. **Seogjoo Jang**, Soonmin Jang, and Gregory A. Voth ; “Applications of higher order composite factorization schemes in imaginary time path integral simulations,” *Journal of Chemical Physics* **115**, 7832 (2001)
14. **Seogjoo Jang**, Sara E. Dempster, and Robert J. Silbey ; “Characterization of the static disorder in the B850 band of LH2,” *Journal of Physical Chemistry B* **105**, 6655 (2001)
13. Sara E. Dempster, **Seogjoo Jang**, and Robert J. Silbey ; “Single molecule spectroscopy of disordered circular aggregates: A perturbation analysis,” *Journal of Chemical Physics* **114**, 10015 (2001)

12. **Seogjoo Jang** and Jianshu Cao ; “Nonadiabatic instanton calculation of multistate electron transfer reaction rate: Interference effects in three and four states systems,” *Journal of Chemical Physics* **114**, 9959 (2001)
11. David R. Reichman, Pierre-Nicholas Roy, **Seogjoo Jang**, and Gregory A. Voth ; “A Feynman path centroid dynamics approach for the computation of time correlation functions involving nonlinear operators,” *Journal of Chemical Physics* **113**, 919 (2000)
10. **Seogjoo Jang** and Gregory A. Voth ; “A relationship between centroid dynamics and path integral quantum transition state theory,” *Journal of Chemical Physics* **112**, 8747 (2000)
9. **Seogjoo Jang**, Charles D. Schwieters, and Gregory A. Voth ; “A modification of path integral quantum transition state theory for asymmetric and metastable potentials,” *Journal of Physical Chemistry A* **103**, 9527 (1999)
8. Soonmin Jang, **Seogjoo Jang**, and Gregory A. Voth ; “Quantum molecular dynamics simulations of low-temperature high energy density matter : Solid p – H<sub>2</sub>/Li and p – H<sub>2</sub>/B,” *Journal of Physical Chemistry A* **103**, 9512 (1999)
7. Pierre-Nicholas Roy, **Seogjoo Jang**, and Gregory A. Voth ; “Feynman path centroid dynamics for Fermi-Dirac statistics,” *Journal of Chemical Physics* **111**, 5303 (1999)
6. **Seogjoo Jang** and Gregory A. Voth ; “A derivation of centroid molecular dynamics and other approximate time evolution methods for path integral centroid variables,” *Journal of Chemical Physics* **111**, 2371 (1999)
5. **Seogjoo Jang** and Gregory A. Voth ; “Path integral centroid variables and the formulation of their exact real time dynamics,” *Journal of Chemical Physics* **111**, 2357 (1999)
4. **Seogjoo Jang** and Gregory A. Voth ; “Response to Comment on Simple reversible Molecular Dynamics algorithms for Nosé-Hoover chain dynamics,” *Journal of Chemical Physics* **110**, 3626 (1999)
3. **Seogjoo Jang** and Gregory A. Voth ; “Lithium impurity recombination in solid *para*-hydrogen: A path integral quantum transition state theory study,” *Journal of Chemical Physics* **108**, 4098 (1998)
2. **Seogjoo Jang** and Gregory A. Voth ; “Simple reversible Molecular Dynamics algorithms for Nosé-Hoover chain dynamics,” *Journal of Chemical Physics* **107**, 9514 (1997)
1. **Seogjoo Jang**, Kook Joe Shin, and Sangyoub Lee ; “Effects of excitation migration and translational diffusion in the luminescence quenching dynamics,” *Journal of Chemical Physics* **102**, 815 (1995)