

John M. Jean

Professor
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Research Interests

Quantum statistical mechanics; phase-coherent dynamics in strongly-interacting donor-acceptor systems; philosophy of Quantum Theory; history of the EPR Paradox and Hidden Variable theories

Academic Positions

2019-present	Professor of Chemistry, Regis University
2008-2019	Associate Professor of Chemistry, Regis University
2006-2008	Assistant Professor of Chemistry, Regis University
1998-2005	Research Associate Professor of Molecular Biophysics, Washington University St. Louis School of Medicine
1990-1998	Assistant Professor of Chemistry, Department of Chemistry, Washington University, St. Louis

Education

University of Chicago and the James Franck Institute, Postdoctoral Fellow, 1987-1990
University of Texas at Austin, Ph.D. in Chemical Physics, 1987
University of Texas at Arlington, B.S. in Chemistry, 1979

Professional Organizations

American Physical Society (Division of Chemical Physics; Forum on History of Physics)
American Association for the Advancement of Science
Philosophy of Science Association
Fulbright Association

Honors / Awards

Faculty Lecturer of the Year, Regis College, 2016
Fulbright Lecturer in the Humanities, School of Letters, University of Lisbon, 2013
Keynote Speaker, Regis College Faculty Conference on Core Curriculum Development 2007
DuPont Graduate Fellowship, University of Texas 1981-1982

University Committees and Service Work

Chair, Academic Policies and Standards Committee (August 2008-May 2010)
Chair, Department of Chemistry (August 2008-August 2011, May 2014-present)
Member, Environmental Studies Program Advisory Committee (August 2009-May 2011)
Member, Faculty Search Committees (Department of Biology-2009-2010, Department of Physics 2009-2010, Department of Psychology 2008-2009, School of Pharmacy, 2008-2009)
Authored *Department of Chemistry Assessment Plan* (2009)
Authored *Department of Chemistry Strategic Plan* (2009-2010)
Developed revised upper-division Chemistry curriculum in response to new American Chemical Society Committee on Professional Training mandates for undergraduate curricula (2011)
Academic Unit Review Coordinator, Academic Policies and Standards Committee (August 2016-May 2017)
Member, Institutional Animal Care and Use Committee (IACUC) (Spring 2012-2016)
Member, Travel Study Committee (August 2015-May 2016)

Invited Lectures

Between idea and reality: How far can metaphysical theorizing take us in the interpretation of quantum theory? 40th Fulbright Association Conference, Washington D.C., Nov. 2017.

Models, measurement, and metaphysical baggage: 90 Years of quantum theory. Regis College Faculty Lecture of the Year, Nov. 2016.

Holism and non-separability in quantum mechanics: A brief history of the Einstein-Podolsky-Rosen paradox. Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, Caparica, Portugal. Dec. 2013.

Quantum Entanglement and Bell's Theorem, Faculdade de Ciências, Universidade de Lisboa, Lisbon, Portugal. Nov. 2013.

Fluorescence dynamics of 2-aminopurine in DNA oligomers. Faculdade de Ciências, Instituto Superior Técnico, Lisbon, Portugal. Nov. 2013

Teaching ethics and the technology of warfare in the 21st century. Faculdade de Letras, American Studies Program, Universidade de Lisboa, Oct. 2013.

Fretting about FRET: Theoretical and experimental studies of electronic energy transfer in 2-aminopurine-labeled DNA oligomers. University of Notre Dame, March 2009.

Thermal fluctuations and excitonic interactions in 5'-X-2AP-Y' trinucleotides and polyadenosine. National Meeting of the American Physical Society, Denver, CO, March 2007.

Conformational dynamics and rate processes in 2-aminopurine-labeled DNA, Symposium on Photodynamics in Biological Molecules - PacifiChem 2005 Conference, Honolulu, HI, December 2005.

Photophysics of 2-aminopurine in DNA, Department of Chemistry, University of Houston, March 2005.

Effects of structural fluctuations on charge-transfer and energy transfer in DNA, Department of Physics, University of Kansas, October, 2004.

Correlated electronic structure methods: Applications to DNA bases and base analogs, Center for Computational Biology, Washington University, May, 2003.

Time-dependent density functional study of DNA bases and DNA oligomers containing 2-aminopurine, 125th National Meeting of the American Chemical Society, New Orleans, LA, March, 2003.

Electronic structure and fluorescence dynamics of 2-aminopurine in DNA, Department of Chemistry, Auburn University, April, 2002.

Theoretical and experimental aspects of fluorescence correlation spectroscopy: Applications to high-throughput screening, Monsanto Corporation, St. Louis, MO, March 2002.

Fluorescence dynamics of 2AP-labeled nucleic acids, Biological Fluorescence Subgroup; Biophysical Society National Meeting, Boston, MA, Feb. 2001.

Probing nucleic acid structure and dynamics with fluorescent base analogs, Department of Chemistry, St. Louis University, November, 2000.

Vibrationally-coherent photobiology, Department of Chemistry, Ohio State University, May, 1997.

Vibrationally-coherent photobiology, Department of Chemistry, Vanderbilt University, February, 1997.

A crash course on density matrices and relaxation processes, Graduate Student Seminar Series; Department of Chemistry, Vanderbilt University, February, 1997.

Quantum coherence effects in ultrafast electron transfer reactions, Department of Chemistry, University of Oregon, February, 1997.

Picosecond Raman spectroscopy as a probe of vibrational energy transfer in solution, Department of Chemistry, University of Missouri, St. Louis, September, 1996.

Vibrationally coherent electronic curve crossing in condensed phases, 112th National Meeting of the American Chemical Society, Orlando, FL, August, 1996.

Probing the effects of structural rigidity on intra- and intermolecular vibrational dynamics: Picosecond Raman scattering from stilbene and its rigid electronic analogs, Department of Chemistry, University of Missouri, October, 1995.

Time- and frequency-resolved fluorescence as a probe of coherent dynamics in ultrafast electron transfer processes, 108th National Meeting of the American Chemical Society, Washington, D.C. August, 1994.

New insights into condensed phase barrier crossing: Picosecond resonance Raman scattering and fluorescence studies of trans-stilbene in solution, Department of Physics, Washington University, November, 1993.

Probing excited state vibrational dynamics in trans-stilbene with picosecond resonance Raman spectroscopy
Department of Chemistry, Trinity University, November, 1993.

Macroscopic and microscopic aspects of electronic energy transport in photosynthesis, Department of Chemistry, University of Illinois, Urbana-Champaign, December 1991.

Inclusion of Herzberg-Teller coupling effects in a time-domain theory of resonance Raman scattering, University of Chicago, James Franck Institute, March 1991.

Publications

J.M. Jean, B.P. Krueger, *Structural fluctuations and excitation transfer between adenine and 2-aminopurine in single-stranded deoxytrinucleotides*. **J. Phys. Chem. B.** 110, 2899 (2006).

L. Kurz, B. Fite, J.M. Jean, T.R. Erpelding, P.R. Callis. *Photophysics of tryptophan fluorescence: Link with the catalytic strategy of the citrate synthase from Thermoplasma acidophilum*. **Biochemistry** 44 1394 (2005).

J.M. Jean, *Stacking-unstacking dynamics of oligodeoxynucleotide trimers*. **Biochemistry** 43, 10277 (2004).

J.M. Jean, K.B. Hall, *2-Aminopurine Electronic Structure and Fluorescence Properties in DNA*. **Biochemistry**, 41, 13152 (2002).

J.M. Jean, K.B. Hall, *2-aminopurine fluorescence quenching and lifetimes: Role of base-stacking*. **Proc. Natl. Acad. Sci.** 98, 37 (2001).

J.M. Jean, K.B. Hall, *Theoretical study of the excited state properties and transitions of 2-aminopurine in the gas phase and in solution*. **J. Phys. Chem. A.** 104, 1930 (2000).

J.M. Jean, C. Clerte, K.B. Hall, *Global and local dynamics of the human U1A protein determined by tryptophan fluorescence*. **Protein Science** 8, 2110 (1999).

J. M. Jean, *Excitation effects on the quantum dynamics of condensed phase two-dimensional electronically nonadiabatic processes*. **J. Phys. Chem.** 102, 7549 (1998).

J. Qian, S.L. Schultz, J.M. Jean, *Separability of intra- and intermolecular vibrational relaxation processes in the S_1 state of trans-stilbene*. **J. Phys. Chem.** 101, 1000 (1997).

J. Qian, S.L. Schultz, J. Zdrodowski, J.M. Jean, *Picosecond anti-Stokes studies of intramolecular vibrational redistribution in trans-stilbene*. **Proc. XVth International Conference on Raman Spectroscopy** (1996).

J. M. Jean, *Vibrational coherence effects on electronic curve crossing*. **J. Chem. Phys.** 104, 5638 (1996).

J. Qian, S.L. Schultz, J.M. Jean, *Picosecond anti-Stokes studies of intramolecular vibrational redistribution in solution*. **Proc. VIIth International Conference on Time-Resolved Vibrational Spectroscopy**, Santa Fe, NM. (1996).

J. Qian, S.L. Schultz, J.M. Jean, *Observation of intramolecular vibrational redistribution and vibrational cooling in the S_1 state of trans-stilbene and 2-phenylindene*. **Chem. Phys. Lett.** 233, 9 (1995).

- J.M. Jean, G.R. Fleming, *Competition between energy and phase relaxation in electronic curve crossing processes*. **J. Chem. Phys.** 103, 2092 (1995).
- J.M. Jean, *Time and frequency-resolved spontaneous emission as a probe of coherence effects in ultrafast electron transfer reactions*. **J. Chem. Phys.** 101, 10464 (1994).
- J. Qian, S.L. Schultz, G.R. Bradburn, J.M. Jean, *Picosecond resonance Raman studies of ultrafast vibrational dynamics of S₁ trans-stilbene in solution*. **J. Luminescence** 61, 727 (1994).
- J. Qian, S.L. Schultz, G.R. Bradburn, J.M. Jean, *Picosecond resonance Raman studies of vibrational cooling of trans-stilbene in alcohols and alkanes*. **J. Phys. Chem.** 97, 10638 (1993).
- D.C. Todd, G.R. Fleming, J.M. Jean, *Calculation of absorption and emission spectra: A study of cis-stilbene*. **J. Chem. Phys.** 97, 8915 (1992).
- J.M. Jean, R.A. Friesner, G.R. Fleming, *Application of a multi-level Redfield theory to electron transfer in condensed phases*. **J. Chem. Phys.** 96, 5827 (1992).
- Y.W. Jia, J.M. Jean, M.M. Werst, C.-K Chan, G.R. Fleming, *Simulations of the temperature dependence of energy transfer in the PSI core antenna*. **Biophys. J.** 63, 259 (1992).
- D.C. Todd, J.M. Jean, S.J. Rosenthal, D. Yang, G.R. Fleming, *Fluorescence upconversion study of cis-stilbene isomerization*. **J. Chem. Phys.** 93, 8658 (1990).
- J.M. Jean, D.C. Todd, S.J. Rosenthal, A.J. Ruggiero, G.R. Fleming, *Dynamics of cis-stilbene isomerization*. in **Ultrafast Phenomena VII**, ed. C.B. Harris & E.P. Ippen, G.A. Mourou, A.H. Zewail, Springer-Verlag, Berlin (1990).
- J.M. Jean, R.A. Friesner, G.R. Fleming, *Classical and quantum models for activationless reaction dynamics*. **Ber. Bunsenges. Phys. Chem.** 95, 253 (1990).
- M. Belhadj, J.M. Jean, R.A. Friesner, J. Schoonover, W.H. Woodruff, *Theoretical analysis of resonance Raman spectra from the blue copper protein azurin*. **J. Phys. Chem.** 94, 2160 (1990).
- J.M. Jean, C.-K. Chan, L. Mets, R.S. Alberte, G.R. Fleming, T.G. Owens, *Energy transfer in photosynthesis*. **Proc. International Conference on Energy and Electron Transfer (Prague)** Vol. 2, 64-68 (1990).
- J.M. Jean, C.-K. Chan, G.R. Fleming, *Excitation transport and trapping on spectrally disordered lattices*. **Biophys. J.** 56, 1203 (1989).
- M. Belhadj, J.M. Jean, R.A. Friesner, J. Schoonover, W.H. Woodruff, *Theoretical simulation of low-temperature resonance Raman spectra from blue copper proteins*. **Proc. Raman Centennial Conference, Calcutta, India** (1988).
- J.M. Jean, C.-K. Chan, G.R. Fleming, *Electronic energy transfer in photosynthetic bacterial reaction centers*. **Isr. J. Chem.** 28, 169 (1988).

J.M. Jean, R.A. Friesner, *An accurate and efficient decoupling approximation for temperature-dependent multimode resonance Raman spectra*. **J. Chem. Phys.** 85, 2353 (1986).

R.A. Friesner, B.M. Pettitt, J.M. Jean, *Calculation of temperature-dependent multimode resonance Raman lineshapes for harmonic potentials*. **J. Chem. Phys.** 82, 2918. (1985).

G.T. Babcock, J.M. Jean, L.N. Johnston, G. Palmer, W.H. Woodruff, *Flow-flash time-resolved resonance Raman spectroscopy of the oxidation of reduced and mixed-valence cytochrome oxidase by dioxygen*. **J. Inorg. Biochem.** 23, 243 (1985).

G.T. Babcock, J.M. Jean, L.N. Johnston, G. Palmer, W.H. Woodruff, *Time-resolved resonance Raman scattering of transients formed during the oxidation of cytochrome oxidase by dioxygen*. **J. Am. Chem. Soc.** 106, 8305 (1984).