Curriculum Vitae of Prof. Christoph G. F. Rose-Petruck
January 2023

1 Name, position, academic department

Christoph Rose-Petruck, Associate Professor of Chemistry, Department of Chemistry, Brown University

2 Home Address

3 Education

Dr. rer. nat., Ludwig-Maximilians University München, Germany, May 1993. "Photoelectron-spectroscopic investigations for detecting ions in selected states and their reactions with molecules in the sub-thermal range." Thesis advisor: Professor Karl L. Kompa, in the Laser Chemistry Department of the Max-Planck Institute for Quantum Optics, Garching, Germany.

Diplom, Physics with specializations in electrical engineering and plasma physics, Technical University Hannover, Germany, Oct. 1988

Vordiplom, Georg-August University at Göttingen, Germany, Sept. 1984

4 Professional Appointments

Professor of Chemistry **July 2012 - present**
Department of Chemistry, Brown University, Providence

Ultrafast x-ray absorption measurements and related theoretical investigations of molecular dynamics in liquids with applications to inorganic and bioinorganic processes. High sensitivity x-ray imaging methods for material studies and bio-medical imaging. Development of nanomaterials for cancer imaging. CO_2 capture and up-conversion into feedstock for the chemical industry.

Visiting Professor of Biomedical and Clinical Technology **June 2011 - 2018**
Faculty of Biomedical Engineering
Czech Technical University, Kladno, Czech Republic

Development and application of higher performance x-ray imaging modalities for bio-medical research and clinical imaging.

Associate Professor of Chemistry **July 2005 – June 2012**
Department of Chemistry, Brown University, Providence

Ultrafast x-ray absorption measurements and related theoretical investigations of molecular dynamics in liquids with applications to inorganic and bioinorganic processes. X-ray diffraction studies of ultrafast phase transitions in crystals. Design, construction and application of ultrafast laboratory scale x-ray sources. Development of computational methods related to x-ray spectroscopic characterization of chemical systems. Applications of laser plasma x-ray sources for medical imaging.

President, Chief Science Officer **2003 – present**
Research Instruments Corporation, Providence, RI

Development and marketing of high-brightness x-ray sources and related equipment.

Manning Assistant Professor
and Assistant Professor of Chemistry **Sept. 2002 – June 2005**
Department of Chemistry, Brown University, Providence

Ultrafast x-ray absorption measurements and related theoretical investigations of molecular dynamics in liquids with applications to inorganic and bioinorganic processes. X-ray diffraction studies of ultrafast phase transitions in crystals. Design, construction and application of ultrafast laboratory scale x-ray sources. Development of computational methods related to x-ray spectroscopic characterization of chemical systems. Applications of laser plasma x-ray sources for medical imaging.

Assistant Professor of Chemistry **July 1998 – Sept. 2002**
Department of Chemistry, Brown University, Providence

Ultrafast x-ray absorption measurements and related theoretical investigations of molecular dynamics in liquids and biomembranes with applications to inorganic and bioinorganic processes. X-ray diffraction studies of ultrafast phase transitions in crystals. Design, construction and application of ultrafast laboratory scale x-ray sources. Development of computational methods related to x-ray spectroscopic characterization of chemical systems. Applications of laser plasma x-ray sources for medical imaging.

Research Associate **Feb. 1996 - June 1998**
Department of Chemistry and Biochemistry,
University of California, San Diego

X-ray diffraction studies of ultrafast phase transitions in crystals. Design and construction of ultrafast x-ray diffractometers and absorption spectrometers. Molecular dynamics simulations related to cluster ionization in ultrashort laser pulses. Development of novel ultrashort pulse laser components.

Postgraduate Research Chemist **March 1993 - Feb. 1996**
Department of Chemistry and Biochemistry,
University of California, San Diego

Design and construction of ultrafast electron and x-ray diffractometers. Development of multi-terawatt, 20 femtosecond laser components. Software development for computer simulation of ultrafast electron and light pulse optics. Numerical investigation of high intensity light propagation and interaction with matter. Development of x-ray techniques for medical imaging.

Research Associate **April 1992 - April 1993**
Research Assistant **April 1989 - March 1992**
Department of Laser Chemistry,
Max-Planck Institute for Quantum Optics, Garching, Germany

Measurements of absolute reaction cross sections of ions with small molecules at sub-thermal collision energies. Investigations of angular dependent emissions of photoelectrons after ionization by resonantly enhanced multiphoton ionization. Construction of a guided ion-beam apparatus for studying reactions of ions with small molecules at sub-thermal collision energies. Construction of a photoelectron time-of-flight spectrometer with high detection efficiency and high energy resolution. Development of software for complete automation of experimental procedures.

Marketing Consultant **June 1990 - June 1991**
Marketing Division,
Optische Werke G. Rodenstock, Munich, Germany

Screening of the market power of competitors in the area of technical optics.

Software Consultant **Oct. 1988 - Dec. 1988**
Development Center for Microelectronics, Siemens AG, Duesseldorf,
Germany

Development of software for the design of microchip layout on VAX8600 and Sun4.

Research Assistant **April 1987 - April 1988**
Institute for Atom and Molecule Physics, **Oct. 1985 - March 1986**
Technical University Hannover, Hannover, Germany

Development of electronics and computer hardware and software for automated data acquisition and electro-mechanical positioning. Improvement and operation of a photoelectron spectrometer.

Research Assistant **Oct. 1986 - March 1987**
Institute for Plasma Physics,
Technical University Hannover, Hannover, Germany

Detection of metal impurities in the discharge of excimer lasers by fluorescence spectroscopy. Time-resolved spectroscopy of the Xe**-Xe*-transition and comparison with simulations.

Research Assistant **April 1986 - Oct. 1986**
Institute for Biophysics,
Technical University Hannover, Hannover, Germany

Maintenance and performance tests of a magnetic mass spectrometer.

5 Publications

5.a Books and Monographs

5.b Chapters in Books

1. "Incoherent X-ray Plasma Sources," J. Rocca, C. Rose-Petruck, N. Fisch, H. Milchberg and M. Zolotorev, in *Report on Compact Light Sources to the US Department of Energy, Office of Basic Energy Sciences* May ed., edited by W. A. Barletta and M. Borland (2010).

2. "Ultrafast laser-pump x-ray probe measurements of solvated transition metal complexes," T. Lee, F. Benesch, C. Reich and C. G. Rose-Petruck, in *Femtochemistry VII*, edited by Jr. A.W. Castleman and M. Kimble (Elsevier, Washington, DC, 2005), p. 23 - 33.
3. "Thermodynamics and Kinetics, 2. ed.," C. Rose-Petruck, in *Basic Concepts of Chemistry*, 6 ed., edited by Leo J. Malone (John Wiley & Sons, New York, 2004), ISBN - 0-471-66723-4.
4. "Thermodynamics and Kinetics, 1. ed.," C. Rose-Petruck, in *Basic Concepts of Chemistry*, 6 ed., edited by Leo J. Malone (John Wiley & Sons, New York, 2003), ISBN - 0-471-45120-7.
5. "Ultrafast x-ray diffraction and absorption," C. P. J. Barty, M. Ben-Nun, T. Guo, F. Ráksi, C. Rose-Petruck, J. A. Squier, K. R. Wilson, V. V. Yakovlev, P. Weber, Z. Jiang, A. Ikhlef and J. C. Kieffer, in *Time Resolved Electron and X-ray Diffraction*, edited by P. M. Rentzepis and J. Helliwell (Oxford University Press, New York, 1998), p. 44.

5.a Patents and disclosure

1. "Modular Laser-Produced Plasma X-ray System," C. Rose-Petruck, US11,330,697 B2 (2021).

2. "Modular Laser-Produced Plasma X-ray System," C. Rose-Petruck and D. J. DeCiccio, US11,324,103 B2 (2021).

3. "X-Ray Spatial Frequency Heterodyne Imaging with Protein-Based Nanobubble Contrast Agents," C. Rose-Petruck, T. Douglas, D. Rand and M. Uchida, US10,307,527 (2019).

4. "In-situ X-ray scatter imaging techniques for the analysis of electrodes in batteries," C. Rose-Petruck, B. W. Sheldon, A. K. Stefan and F. Schunk, US10,833,374 (2017).

5. "Electrochemical processing of clathrate hydrates," C. Rose-Petruck, G. T. R. Palmore, D. DeCiccio and S. Ahn, US9,234,285 (2016).

6. "Methods, compositions and kits for imaging cells and tissues using nanoparticles and spatial frequency heterodyne imaging," C. Rose-Petruck, J. R. Wands, Z. Derdak, D. Rand and V. Ortiz, US9,316,645 (2016).

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5.a Refereed Journal Articles

1. "Electric Field Induced Release of Guest Molecules from Clathrate Hydrates and Its Consequences for Electrochemical CO2 Conversion," M. Lyu, Z. Li, M. van den Bossche, H. Jónsson and C. Rose-Petruck, Chemical Physics, 111839 (2023).

2. "Comparing the Accuracy of micro-focus x-ray technology to standard clinical ultrasound for locating small glass foreign bodies in soft tissue," S. Wu, T. Parkman, S. Dunsiger, A. Anderson, D. Deciccio, E. Lash, J. Fletcher, W. Galvin, F. Rose-Petruck, B. Becker and C. Rose-Petruck, Applied Sciences to be submitted (2023).

3. "Operando Imaging of the Evolution of Electrode Inhomogeneities in Unmodified Li-ion Cells," A. K. Stephan, R. Kumar, B. W. Sheldon and C. Rose-Petruck, Journal of Applied Physics to be submitted (2023).

4. "Competing HCOOH and CO Pathways in CO2 Electroreduction at Copper Electrodes: Calculations of Voltage-Dependent Activation Energy," M. Van den Bossche, C. Rose-Petruck and H. Jónsson, The Journal of Physical Chemistry C 125 (25), 13802-13808 (2021).

5. "Observation of Electric-Field-Induced Liberation of Guest Molecules from Clathrate Hydrate," Z. Li, M. Lyu, H. Jonsson and C. Rose-Petruck, J Phys Chem Lett 12 (42), 10410-10416 (2021).

6. "Addition to “Assessment of Constant-Potential Implicit Solvation Calculations of Electrochemical Energy Barriers for H2 Evolution on Pt”," M. Van den Bossche, E. Skúlason, C. Rose-Petruck and H. Jónsson, The Journal of Physical Chemistry C 123 (25), 15875-15875 (2019).

7. "Assessment of Constant-Potential Implicit Solvation Calculations of Electrochemical Energy Barriers for H2 Evolution on Pt," M. V. d. Bossche, E. Skulason, C. Rose-Petruck and H. Jonsson, Journal of Physical Chemistry C 123 (7), 4116-4124 (2018).

8. "Ultrafast X-ray Absorption Study of Longitudinal-Transverse Phonon Coupling in Electrolyte Aqueous Solution," Y. Jiao, B. Adams, A. O. Dohn, H. Jonsson and C. Rose-Petruck, PCCP 19, 27266-27274 (2017).

9. "Ultrafast X-ray measurements of the glass-like, high-frequency stiffness of aqueous solutions," Y. Jiao, B. Adams and C. Rose-Petruck, PCCP 19, 21095-21100 (2017).

10. "Picosecond-resolved x-ray absorption spectroscopy at low signal contrast using a hard x-ray streak camera," B. Adams, Y. Jiao and C. Rose-Petruck, Journal of Synchrotron Radiation 22 (4), 1022-9 (2015).

11. "Spatial Frequency Heterodyne Imaging of Aqueous Phase Transitions inside Multi-walled Carbon Nanotubes," F. Schunk, D. Rand and C. Rose-Petruck, PCCP 17, 31237 (2015).

12. "X-ray focusing scheme with continuously variable lens," B. Adams and C. Rose-Petruck, Journal of Synchrotron Radiation 22, 16-22 (2015).

13. "X-ray Scatter Imaging of Hepatocellular Carcinoma in a Mouse Model Using Nanoparticle Contrast Agents," D. Rand, Z. Derdak, J. R. Wands and C. Rose-Petruck, Scientific Reports 5, 15673 (2015).

14. "Electrochemical up-conversion of CO2 with clathrate hydrate electrolytes and Copper foam electrodes," D. DeCiccio, S. Ahn, S. Sen, F. Schunk, G. T. R. Palmore and C. Rose-Petruck, Electrochemistry Communications 52, 13-16 (2014).

15. "A Highly Sensitive X-ray Imaging Modality for Hepatocellular Carcinoma Detection," D. Rand, E. G. Walsh, Z. Derdak, J. R. Wands and C. Rose-Petruck, Physics in Medicine and Biology 60, 769 (2014).

16. "Spatial frequency heterodyne imaging in the soft x-ray water window," P. Bruza, D. Panek, M. Vrbová, V. Fidler and C. Rose-Petruck, Applied Physics Letters 104, 254101 (2014).

17. "X-Ray Spatial Frequency Heterodyne Imaging of Protein-Based Nanobubble Contrast Agents," D. Rand, M. Uchida, T. Douglas and C. Rose-Petruck, Optics Express 22 (19), 23290 - 23298 (2014).

18. "2-ps Hard X-Ray Streak Camera Measurements at Sector 7 Beamline of the Advanced Photon Source (invited)," M. Chollet, B. Ahr, D. A. Walko, C. Rose-Petruck and B. Adams, IEEE Journal of Selected Topics in Quantum Electronics 18 (1), 66-73 (DOI: 10.1109/JSTQE.2011.2105464) (2012).

19. "X-ray spatial frequency heterodyne imaging," B. Wu, Y. Liu, C. Rose-Petruck and G. J. Diebold, Applied Physics Letters 100, 061110 (2012).

20. "Hard X-ray streak camera at the advanced photon source," M. Chollet, B. Ahr, D. A. Walko, C. Rose-Petruck and B. Adams, Nuclear Instruments and Methods in Physics Research A 649 (1), 70 - 72 (2011).

21. "Nanomaterials for X-ray Imaging: Gold Nanoparticle Enhancement of X-ray Scatter Imaging of Hepatocellular Carcinoma," D. Rand, V. Ortiz, Y. L. Z. Derdak, J. R. Wands, M. Tatíček and C. Rose-Petruck, Nanoletters 11 (7), 2678-2683 (2011).

22. "Picosecond x-ray absorption measurements of the ligand substitution dynamics of Fe(CO)5 in ethanol," B. Ahr, M. Chollet, B. Adams, E. M. Lunny, C. M. Laperle and C. Rose-Petruck, PCCP 13 (Also PCCP Cover Page, April 2011) (13), 5590-5599 (2011).

23. "X-ray spatial harmonic imaging of phase objects," Y. Liu, B. Ahr, A. Linkin, G. J. Diebold and C. Rose-Petruck, Optics Letters 36, 2209 (2011).

24. "X-ray elastography: Modification of x-ray phase contrast images using ultrasonic radiation pressure," T. J. Hamilton, C. Bailat, S. Gehring, C. M. Laperle, J. Wands, C. Rose-Petruck and G. J. Diebold, Journal of Applied Physics 105 (10), 102001 (2009).

25. "X-ray Phase Contrast Imaging: Transmission Functions Separable in Cylindrical Coordinates," G. Cao, T. Hamilton, C. M. Laperle, C. Rose-Petruck and G. J. Diebold, J. Appl. Phys. 105, 102002 (2009).

26. "Low-density contrast agents for x-ray phase contrast imaging: the use of ambient air for x-ray angiography of excised murine liver samples," C. M. Laperle, P. Wintermeyer, E. Walker, D. Shi, M. A. Anastasio, C. Rose-Petruck, G. Diebold and J. R. Wands, Physics in Medicine and Biology 53, 6911–6923 (2008).

27. "Structure of Solvated Fe(CO)5: Complex Formation during Solvation in Alcohols," J. Lessing, X. Li, T. Lee and C. Rose-Petruck, J. Phys. Chem. A 112, 2282-2292 (2008).

28. "Propagation based differential phase contrast imaging and tomography of murine tissue with a laser plasma x-ray source," C. M. Laperle, P. Wintermeyer, J. R. Wands, D. Shi, M. A. Anastasio, X. Li, B. Ahr, G. J. Diebold and C. Rose-Petruck, Applied Physics Letters 91 (17), 173901 (2007).

29. "Ultrafast x-ray pulses emitted from a liquid mercury target," C. Reich, C. M. Laperle, X. Li, B. Ahr, F. Benesch-Lee and C. G. Rose-Petruck, Optics Letters 32 (4), 427 - 429 (2007).

30. "Ultrafast XAFS of transition metal complexes," T. Lee, C. Reich, C. M. Laperle, X. Li, M. Grant and C. G. Rose-Petruck, in Ultrafast Phenomena, Vol. XV, edited by R.J.D. Miller, A.M. Weiner, P. Corkum, and D.M. Jonas (Springer Verlag, Berlin, 2006), p. 719-721, ISBN -.

31. "Ultrasonically Modulated X-ray Phase Contrast Imaging," T. J. Hamilton, G. Cao, C. J. Bailat, J. Wands, S. Gehring, C. Rose-Petruck and G. J. Diebold, in IEEE International Symposium on Biomedical Imaging (IEEE, 2006, p. 1108- 1111.

32. "X-ray Phase Contrast Imaging: Transmission Functions Separable in Cartesian Coordinates," G. Cao, T. Hamilton, C. Rose-Petruck and G. J. Diebold, J. Am. Optical Soc. A 24, 1201-1208 (2006).

33. "Ultrafast table-top laser pump - x-ray probe measurement of solvated Fe(CN)64-," T. Lee, Y. Jiang, C. Rose-Petruck and F. Benesch, J. Chem. Phys. 122 (8), 084506/1 - 084506/8 (2005).

34. "Acoustic radiation pressure: a "phase contrast" agent for x-ray phase contrast imaging," C. J. Bailat, T. Hamilton, C. Rose-Petruck and G. J. Diebold, Applied Physics Letters 85 (19), 4517-4519 (2004).

35. "Acoustically Modulated X-ray Phase Contrast Imaging," T. Hamilton, C. J. Bailat, C. Rose-Petruck and G. J. Diebold, Physics in Medicine and Biology 49, 4985-4996 (2004).

36. "Molecular and compound-specific isotopic characterization of monocarboxylic acids in carbonaceous meteorites," Y. Huang, Y. Wang, M. R. Alexandre, T. Lee, C. Rose-Petruck, M. Fuller and S. Pizzarello, Geochimica et Cosmochimica Acta 69 (4), 1073 - 1084 (2004).

37. "Structure of solvated Fe(CO)5: A concerted XAFS, FTIR, and DFT study of solvation in fluorinated arenes," T. Lee, E. Welch and C. Rose-Petruck, J. Phys. Chem. A 108, 11768-11778 (2004).

38. "Generation of ultrashort hard-x-ray pulses with tabletop laser systems at a 2-kHz repetition rate," Y. Jiang, T. Lee and C. Rose-Petruck, J. Opt. Soc. Am. B 20 (1), 229 - 237 (2003).

39. "Structure of solvated Fe(CO)5: FTIR measurements and Density Functional Theory calculations," Y. Jiang, T. Lee and C. Rose-Petruck, J. Phys. Chem. A 107, 7524-7538 (2003).

40. "Structure of solvated Fe(CO)5: XANES and EXAFS measurements using ultrafast laser-driven and conventional x-ray sources," T. Lee, F. Benesch, Y. Jiang and C. Rose-Petruck, Chem. Phys. 299 (2-3), 233-245 (2003).

41. "Ultrafast laser-driven x-ray source for x-ray absorption spectroscopy of transition metal complexes," F. Benesch, T. Lee, Y. Jiang and C. Rose-Petruck, Optics Letters 29 (9), 1028-1030 (2003).

42. "High-average-power 2-kHz laser for generation of ultrashort x-ray pulses," Y. Jiang, T. Lee, W. Li, G. Ketwaroo and C. Rose-Petruck, Opt. Lett. 27 (11), 963 -965 (2002).

43. "Ultrafast x-ray measurement of laser heating in semiconductors: Parameters determining the melting threshold," A. Cavalleri, C. W. Siders, C. Rose-Petruck, R. Jimenez, C. Toth, J. A. Squier, C. P. J. Barty, K. R. Wilson, K. Sokolowski-Tinten, M. H. von Hoegen and D. von der Linde, Physical Review B 63 (19), 3306 (2001).

44. "A 50-EW/cm 2 Ti:sapphire laser system for studying relativistic light-matter interactions," B. C. Walker, C. Toth, D. N. Fittinghoff, T. Guo, D.-E. Kim, C. Rose-Petruck, J. A. Squier, K. Yamakawa, K. R. Wilson and C. P. J. Barty, Optics Express 5 (10), 196 - 202 (1999).

45. "Picosecond-milliangstrom lattice dynamics measured by ultrafast x-ray diffraction," C. Rose-Petruck, R. Jimenez, T. Guo, A. Cavalleri, C. W. Siders, F. Ráksi, J. Squier, B. Walker, K. R. Wilson and C. P. J. Barty, Nature 398, 310-312 (1999).

46. "Dispersion considerations in ultrafast CPA systems," D. N. Fittinghoff, B. C. Walker, J. A. Squier, C. S. Tóth, C. Rose-Petruck and C. P. J. Barty, IEEE J. Quant. Elect. 4 (2), 430-440 (1998).

47. "Hybrid vacuum-atmosphere compressor for high peak power, chirped pulse amplification lasers," B. Walker, J. Squier, D. Fittinghoff, C. Rose-Petruck and C. P. J. Barty, IEEE J. Quant. Elect. 4 (2), 441-444 (1998).

48. "Time-resolved x-ray diffraction of GaAs with a 20 fs, laser-driven plasma source," R. Jimenez, C. Rose-Petruck, T. Guo, K. R. Wilson and C. P. J. Barty, in Ultrafast Phenomena, Vol. XI, edited by T. Elsasser, J. G. Fujimoto, D. Wiersma, and W. Zinth (Springer Verlag, Berlin, 1998), p. 404 - 406, ISBN -.

49. "Ultrafast electron dynamics and inner-shell ionization in laser-driven clusters," C. Rose-Petruck, K. J. Schafer, C. P. J. Barty and K. R. Wilson, Phys. Rev. A 55, 1182 (1997).

50. "Generation of 18-fs, multiterawatt pulses using regenerative pulse shaping and chirped pulse amplification," C. P. J. Barty, T. Guo, C. Le Blanc, F. Ráksi, C. Rose-Petruck, J. A. Squier, K. R. Wilson, V. V. Yakovlev and K. Yamakawa, Opt. Lett. 21, 668-670 (1996).

51. "Regenerative pulse shaping and amplification of ultrabroadband optical pulses," C. P. J. Barty, G. Korn, F. Ráksi, C. Rose-Petruck, J. A. Squier, A.-C. Tien, K. R. Wilson, V. V. Yakovlev and K. Yamakawa, Opt. Lett. 21, 219 (1996).

52. "Regenerative pulse shaping: a new technique for ultrabroadband amplification," J. A. Squier, T. Guo, C. Le Blanc, G. Korn, C. Rose-Petruck, F. Ráksi, V. V. Yakovlev, K. Yamakawa and C. P. J. Barty, in Ultrafast Phenomena, Vol. X, edited by J. Fujimoto, W. Zinth, and P. F. Barbara (Springer Verlag, Berlin, 1996), p. 87, ISBN -.

53. "Sub-20-fs multiterawatt laser and ultrafast x-ray source," C. P. J. Barty, T. Guo, C. Le Blanc, C. Rose-Petruck, F. Ráksi, J. A. Squier, B. Walker, P. Weber, K. R. Wilson, V. V. Yakovlev and K. Yamakawa, in Ultrafast Phenomena, Vol. X, edited by J. Fujimoto, W. Zinth, and P. F. Barbara (Springer Verlag, Berlin, 1996), p. 77, ISBN -.

54. "Ultrafast ionization dynamics in laser-driven clusters," C. Rose-Petruck, K. J. Schafer, K. R. Wilson and C. P. J. Barty, in Ultrafast Phenomena, Vol. X, edited by J. Fujimoto, W. Zinth, and P. F. Barbara (Springer Verlag, Berlin, 1996), p. 435, ISBN -.

55. "A guided-ion beam study of the hydrogen atom transfer reaction of state-selected N2+ with H2 at collision energies ranging from sub-thermal to 2 eV (c.m.)," W. J. Knott, D. Proch, K. L. Kompa and C. Rose-Petruck, J. Chem. Phys. 102, 214 (1995).

56. "Next generation ultrashort pulse lasers: terawatts to petawatts," C. P. J. Barty, C. L. Gordon III, G. Korn, B. E. Lemoff, F. Ráksi, C. Rose-Petruck, J. Squier, K. R. Wilson, V. V. Yakovlev and K. Yamakawa, in Laser Interactions and Related Plasma Phenomena XII (AIP Press, New York, 1995, p. 939.

57. "Mode-locking matter with light," B. Kohler, J. L. Krause, F. Ráksi, C. Rose-Petruck, R. M. Whitnell, K. R. Wilson, V. V. Yakovlev, Y. Yan and S. Mukamel, J. Phys. Chem. 97, 12602 (1993).

58. "Photoelectron-spectroscopic investigations for the detection of state-selected ions and their reactions with molecules in the sub-thermal range," C. Rose, Max-Planck Institute for Quantum Optics, Germany, ISBN-ISSN: MPQ182 (1993).

59. "Photoelectron angular distributions and vibrational branching ratios of CO (2+1)-photon ionization via the B1S+ state," G. Sha, D. Proch, C. Rose and K. L. Kompa, J. Chem. Phys. 99, 4334 (1993).

60. "Dynamics of resonant multiphoton ionization and dissociation of nitrogen via the a1Pg (n=9) states probed with a novel electron/ion time-of-flight spectrometer," C. Rose, G. S. Ondrey and D. Proch, Int. J. Mass. Spectrom. Ion Proc. 113, 81 (1991).

61. "Resonant multiphoton ionization dynamics of N2 via the a1Pg (n=10-14) states: preparation of state-selected N2+ X 2S+g(n+=0-4) ions," G. S. Ondrey, C. Rose, D. Proch and K. L. Kompa, J. Chem. Phys. 95, 7823 (1991).

62. "A modular hard- and software package for data handling and its use in a differential collision experiment," C. Rose, A. Grün and H.-P. Neitzke, Meas. Sci. Techn 1, 220 (1990).

63. "A versatile safety device," A. Grün, H.-P. Neitzke, H.-J. Paul and C. Rose, J. Phys. E 22, 817 (1989).

5.b Non-Refereed Journal Articles

1. "LPXS: a high-performance, recirculating liquid-metal laser-driven plasma x-ray source," B. Adams, D. DeCiccio, M. Michon, P. Chmielniak, T. Parkman, G. Diebold, K. Bisogno and C. Rose-Petruck, in SPIE Optical Engineering + Applications (SPIE, 2021), Vol. 11837.

2. "Photothermal Modification of X-ray Phase Contrast Images," C. M. Laperle, G. Cao, T. J. Hamilton, C. Rose-Petruck and G. J. Diebold, in Photons Plus Ultrasound: Imaging and Sensing, edited by A. A. Oraevsky and L. V. Wang (SPIE Publishing, Bellingham, WA, 2007), Vol. 6437, p. 82.

3. "Ultrasonically Modulated X-ray Phase Contrast and Vibration Potential Imaging Methods," T. J. Hamilton, G. Cao, S. Wang, C. J. Bailat, C. K. Nguyen, S. Li, S. Gehring, J. Wands, V. Gusev, C. Rose-Petruck and G. J. Diebold, in Biomedical Thermoacoustics, Optoacoustics, and Acousto-optics, edited by A. A. Oraevsky and L. V. Wang (SPIE Publishing, Bellingham, WA, 2006), Vol. 6086, p. 1-11.

4. "Acoustically Modulated X-ray Phase Contrast and Vibration Potential Imaging," A. C. Beveridge, C. J. Bailat, T. J. Hamilton, S. Wang, C. Rose-Petruck, V. E. Gusev and G. J. Diebold, in Photons Plus Ultrasound: Imaging and Sensing 2005, edited by A.A. Oraevsky and L.V. Wang (SPIE Publishing, Bellingham, WA, 2005), Vol. 5697, p. 90 - 98.

5. "Ultrafast laboratory-based x-ray sources and their applications in chemical research," T. Lee, Y. Jiang, F. Benesch and C. Rose-Petruck, in Commercial and Biomedical Applications of Ultrafast Lasers V, edited by J. Neev, A. Ostendorf, and C. B. Schaffer (SPIE Publishing, Bellingham, WA, 2003), Vol. 4978, p. 77 - 91.

6. "Ultrafast tabletop x-ray sources and their application to XAFS-measurements of transition metal coordination complexes," T. Lee, Y. Jiang, F. Benesch, N. Song and C. Rose-Petruck, in Laser-Generated and Other Laboratory X-Ray and EUV Sources, Optics, and Applications, edited by G. A. Kyrala, A.M. J.-C. Gauthier, C. A. MacDonald, and A. M. Khounsary (SPIE Publishing, Bellingham, WA, 2003), Vol. 5196, p. 352 - 361.

7. "Ultrafast X-ray Absorption Spectroscopy: Observing the equilibrium structure and structural dynamics of solvated molecules," Y. Jiang, W. Li, T. Lee, G. Ketwaroo and C. Rose-Petruck, in Applications of X-rays Generated from Lasers and Other Bright Sources, edited by G. A. Kyrala and J.-C. J. Gauthier (SPIE Publishing, Bellingham, WA, 2001), Vol. 4504, p. 42 - 48.

8. "Ultrafast movies of atomic motion with femtosecond laser-based x-rays," C. W. Siders, A. Cavalleri, K. Sokolowski-Tinten, T. Guo, C. Tóth, R. Jimenez, C. Rose-Petruck, D. v. d. Linde, K. R. Wilson and C. P. J. Barty, in Soft X-ray Lasers and Applications, edited by F. W. Wise and C. P. J. Barty (SPIE Publishing, Bellingham, WA, 2000), Vol. 3776, p. 302.

9. "Picosecond-milliangstrom resolution dynamics by ultrafast x-ray diffraction," T. Guo, C. Rose-Petruck, R. Jimenez, F. Ráksi, J. Squier, B. Walker, K. R. Wilson and C. P. J. Barty, in Applications of X-rays Generated

from Lasers and Other Bright Sources, edited by G. A. Kyrala and J.-C. J. Gauthier (SPIE Publishing, Bellingham, WA, 1998), Vol. 3157, p. 84.

10. "X-ray diffraction study of laser-material interactions with an ultrafast table-top x-ray source," T. Guo, C. Rose-Petruck, R. J. Jimenez, J. A. Squier, B. C. Walker, K. R. Wilson and C. P. J. Barty, in In Situ Process Diagnostics and Intelligent Materials Processing, edited by P. A. Rosenthal, W. M. Duncan, and J. A. Woollam (Materials Research Society Symposium Proceedings, 1998), Vol. 502, p. 77.

11. "Multiterawatt femtosecond lasers for high field physics," C. P. J. Barty, C. L. Gordon III, B. E. Lemoff, F. Ráksi, C. Rose-Petruck, K. R. Wilson, V. V. Yakovlev and K. Yamakawa, in Fourth Tamura Symposium on Accelerator Physics, edited by T. Tajima (AIP Press, New York, 1996), Vol. 356, p. 310.

12. "Sub-20-fs multiterawatt lasers and x-ray applications," C. P. J. Barty, T. Guo, C. Le Blanc, F. Ráksi, C. Rose-Petruck, J. A. Squier, B. Walker, K. R. Wilson, V. V. Yakovlev and K. Yamakawa, in 5th International Conference on X-ray Lasers, edited by S. Svanberg and G. G. Wahlström (Institute of Physics Publishing, Bristol, 1996, p. 282-288.

13. "Techniques for controlling gain narrowing during ultrashort pulse amplification," K. Yamakawa, T. Guo, G. Korn, C. Le Blanc, F. Ráksi, C. Rose-Petruck, J. A. Squier, V. V. Yakovlev and C. P. J. Barty, in Generation, Amplification and Measurement of Ultrashort Laser Pulses III, edited by D. Reitze and W. White (SPIE Publishing, Bellingham, WA, 1996), Vol. 2701, p. 198.

14. "Ultrafast x-ray spectroscopy, a potential in situ approach for studying cluster science," T. Guo, F. Ráksi, C. Rose-Petruck, J. A. Squier, K. R. Wilson, V. V. Yakovlev and C. P. J. Barty, in Fullerenes, Recent Advances in the Physics and Chemistry of Fullerenes and Related Materials, edited by K. M. Kadish and R. S. Ruoff (The Electrochemical Society, Inc., 1996), Vol. 3, p. 771-778.

15. "Ultrashort pulse, ultrahigh peak power Ti:Sapphire lasers," C. P. J. Barty, T. Guo, C. Le Blanc, F. Ráksi, C. Rose-Petruck, J. A. Squier, K. R. Wilson, V. V. Yakovlev and K. Yamakawa, in Generation, Amplification and Measurement of Ultrashort Laser Pulses III, edited by D. Reitze and W. White (SPIE Publishing, Bellingham, WA, 1996), Vol. 2701, p. 84.

16. "Methods for generation of 10-Hz, 100-TW optical pulses," C. P. J. Barty, C. L. Gordon III, B. E. Lemoff, C. Rose-Petruck, F. Ráksi, C. Spielmann, K. R. Wilson, V. V. Yakovlev and K. Yamakawa, in Generation, Amplification and Measurement of Ultrashort Laser Pulses II, edited by F. W. Wise and C. P. J. Barty (SPIE Publishing, Bellingham, WA, 1995), Vol. 2377, p. 311.

17. "Possible ionization "ignition" in laser-driven clusters," C. Rose-Petruck, K. J. Schafer and C. P. J. Barty, in Applications of Laser Plasma Radiation II, edited by M. C. Richardson and G. A. Kyrala (SPIE Publishing, Bellingham, WA, 1995), Vol. 2523, p. 272.

18. "Seeing into matter with x-rays and controlling its evolution with light," C. P. J. Barty, J. Che, T. Guo, B. Kohler, C. LeBlanc, M. Messina, F. Ráksi, C. Rose-Petruck, J. A. Squier, K. R. Wilson, V. V. Yakovlev, K. Yamakawa, Z. Jiang, A. Ikhlef, C. Y. Côté and J. C. Kieffer, in Femtochemistry: The Lausanne Conference (World Scientific, Singapore, 1995, p. 348.

19. "Time-gated medical imaging with ultrafast laser plasma x-rays," C. L. Gordon, B. E. Lemoff, C. Rose-Petruck, F. Raksi, P. M. Bell, K. R. Wilson, V. V. Yakovlev, K. Yamakawa and G. Y. Yin, in Applications of Laser Plasma Radiation II, edited by M. C. Richardson and G. A. Kyrala (SPIE Publishing, Bellingham, WA, 1995), Vol. 2523, p. 286.

20. "Ultrafast x-ray absorption and diffraction," C. P. J. Barty, F. Ráksi, C. Rose-Petruck, K. J. Schafer, K. R. Wilson, V. V. Yakovlev, K. Yamakawa, Z. Jiang, A. Ikhlef, C. Y. Côté and J.-C. Kieffer, in Time Resolved Electron and X-ray Diffraction, edited by P. M. Rentzepis (SPIE Publishing, Bellingham, WA, 1995), Vol. 2521, p. 246.

21. "Design, simulation and visualization of ultrafast electron optical devices," C. Rose-Petruck and K. R. Wilson, in Lasers for RF Guns, edited by T. Srinivasan-Rao (Brookhaven National Laboratory, Upton, NY, 1994), Vol. 53435, p. 109.

22. "Femtosecond pulse shaping for molecular control," B. Kohler, J. L. Krause, F. Ráksi, C. Rose-Petruck, R. M. Whitnell, K. R. Wilson, V. V. Yakovlev and Y. Yan, in Femtosecond Reaction Dynamics, edited by D. A. Wiersma (North-Holland, New York, 1994.

23. "New approaches to solution reaction dynamics: quantum control and ultrafast diffraction," B. Kohler, J. L. Krause, F. Ráksi, C. Rose-Petruck, R. M. Whitnell, K. R. Wilson, V. V. Yakovlev and Y. Yan, in Reaction Dynamics in Clusters and Condensed Phases, The 26th Jerusalem Symposium, edited by J. Jortner, R. D. Levine, and B. Pullman (Kluwer, Dordrecht, 1994.

24. "Quantum control and experimental realities," B. Kohler, J. L. Krause, F. Ráksi, C. Rose-Petruck, R. M. Whitnell, K. R. Wilson, V. V. Yakovlev and Y. Yan, in 6th International Conference on Multiphoton Processes (ICOMP VI) (World Scientific, 1993.

5.c Book Reviews
5.d Abstracts
5.e Invited Lectures

1. "Ultrafast X-ray spectroscopy of the glass-like, high-frequency stiffness of aqueous solutions," C. Rose-Petruck, presented at University of Rhode Island, North Kingstown, RI, 2019.

2. "Ultrafast X-ray spectroscopy of the glass-like, high-frequency stiffness of aqueous solutions," C. Rose-Petruck, presented at 27th Austin Symposium on Molecular Structure Dallas, 2018.

3. "High-efficiency CO2 up-conversion with clathrate hydrates electrolytes," C. Rose-Petruck, presented at New England Catalysis Society Spring Meeting, Brown University, 2016.

4. "Long-lived ice-like structures in aqueous solution detected by second harmonic phonon generation," C. Rose-Petruck, presented at PULSE Institute 10th Anniversary Symposium, Stanford University, 2016.

5. "Ultrafast XANES of solvation shell dynamics," C. Rose-Petruck, presented at 26th Austin Symposium on Molecular Structure Dallas, 2016.

6. "Closing the Carbon Cycle: Capturing and converting CO2 into useful chemicals," C. Rose-Petruck, presented at Chemistry Department Seminar, Quinnipiac University, 2015.

7. "X-ray Spectroscopy with compact x-ray sources," C. Rose-Petruck, presented at SCIX Conference 2015, 2015.

8. "Advanced x-ray imaging methods and possible medical applications," C. Rose-Petruck, presented at ELI Summer School, Extreme Light Infrastructure Beamline Facility, Prague, Czech Republic, 2014.

9. "Ultrafast x-ray imaging in the hard and soft x-ray regime," C. Rose-Petruck, presented at DUR workshop, Extreme Light Infrastructure Beamline Facility, Prague, Czech Republic, 2014.

10. "X-ray scatter-based imaging: from cell studies to clinical imaging," C. Rose-Petruck, presented at BIO-OPT-XUV conference, Faculty for Biomedical Engineering, Czech Technical University, Kladno, Czech Republic, 2014.

11. "X-ray spatial frequency heterodyne imaging: Applications ranging from imaging nano-materials to in vivo immuno-labeled tumors in animals.," C. Rose-Petruck, presented at Material Science Seminar, Argonne National Laboratory, Argonne, IL, 2014.

12. "Clathrate hydrates for CO2 compression and electro-chemical reduction," C. Rose-Petruck, presented at NSF Center for Chemical Innovation, Brown Univeristy, Providence, RI, 2013.

13. "Spatial Frequency X-ray Heterodyne Imaging of Micro and Nano structured Materials and their Time-resolved Dynamics," C. Rose-Petruck, presented at BES Contractor Meeting, Potomac, MD, 2013.

14. "Synchrotron-based x-ray absorption spectroscopy with 2-ps time resolution," C. Rose-Petruck, presented at ACS Annual Meeting, Indianapolis, IN, Dec, 2013.

15. "Time resolved X-ray phase sensitive imaging and imaging based on X-rays diffracted of a sample," C. Rose-Petruck, presented at Extreme Light Infrastructure Beamline Facility, Prague, CzechRepublic, Dec, 2012.

16. "Ultrafast x-ray spectroscopy and x-ray spatial frequency heterodyne imaging of chemical systems," C. Rose-Petruck, presented at Banff Meeting on Structural Dynamics, Banff, Canada, Dec, 2012.

17. "Ultrafast x-ray spectroscopy and x-ray spatial frequency heterodyne imaging of chemical systems," C. Rose-Petruck, presented at VIIIth Workshop on Photo Induced Molecular Processes, Prague, Czech Republic, Dec, 2012.

18. "Bio-medical imaging with x-ray phase sensitive imaging modalities," C. Rose-Petruck, presented at Instruments and Methods for Biology and Medicine, Kladno, Czech Republic, June, 2011.

19. "Cancer detection with X-ray scatter imaging," C. Rose-Petruck, presented at BIO-OPT-XUV Research Team Advancement Workshop, Kladno, Czech Republic, October, 2011.

20. "Imaging and chemical dynamics investigations with ultrashort x-ray pulses," C. Rose-Petruck, presented at Univ. of Colorado / JILA, Boulder, CO, Dec., 2011.

21. "Imaging and Structural Investigations with Femtosecond Laser Produced X-ray Pulses," C. Rose-Petruck, presented at Extreme Light Infrastructure (ELI) Beamlines Scientific Challenges Meeting, Prague, Czech Republic, October, 2011.

22. "Laser-driven plasma x-ray sources," C. Rose-Petruck, presented at National Institute of Standards and Technology, Boulder, CO, Dec, 2011.

23. "Liver cancer detection using phase and scatter sensitive x-ray imaging and nano particle immunolabels for x-ray contrast enhancement," C. Rose-Petruck, presented at Faculty of Biomedical Engineering, Kladno, Czech Republic, Jan., 2011.

24. "Picosecond x-ray spectroscopy and phase sensitive imaging " C. Rose-Petruck, presented at Academy of Sciences of the Czech Republic, Prague, Czech Republic, Jan., 2011.

25. "A spectrum of x-ray science: from ultrafast spectroscopy to phase and scatter sensitive imaging," C. Rose-Petruck, presented at Stanford Linear Accelerator Center, Menlo Park, USA, March, 2011.

26. "Ultrafast ligand substitution dynamics of iron pentacarbonyl measured with 2 picosecond temporal resolution at the Advance Photon Source," C. Rose-Petruck, presented at Max-Planck Institute for Biophyscial Chemistry, Goettingen, Germany, Jan., 2011.

27. "Ultrafast ligand substitution dynamics of iron pentacarbonyl measured with single picosecond temporal resolution using a synchrotron x-ray source," C. Rose-Petruck, presented at Helmholtz-Center Berlin for Materials and Energy, Berlin, Germany, Jan., 2011.

28. "Ultrafast X-ray spectroscopy and X-ray spatial frequency heterodyne imaging," C. Rose-Petruck, presented at JILA, University of Colorado, Boulder, CO, Dec, 2011.

29. "High performance bio-medical imaging and ultrafast chemical dynamics measurements with bright laboratory-based x-ray sources," C. Rose-Petruck, presented at National Heart, Lung, Blood Institute of the NIH, Bethesda, MD, Feb., 2010.

30. "Laser-driven plasma hard x-ray sources," C. Rose-Petruck, presented at US Department of Energy Compact Light Sources Workshop, Rockville, MD, May, 2010.

31. "Phase sensitive x-ray imaging and ultrafast chemical dynamics," C. Rose-Petruck, presented at 7th Prague Workshop on Photoinduced Molecular Processes, Prague, Czech Republic, March, 2010.

32. "Phase sensitive x-ray imaging and ultrafast chemical dynamics," C. Rose-Petruck, presented at Banff meeting on structural dynamics, The Banff Center, Banff, Alberta, Canada, Feb. 25, 2010.

33. "Propagation based differential phase contrast x-ray imaging of soft tissue," C. Rose-Petruck, presented at Advanced Photon Source User Meeting, Argonne, IL, April, 2010.

34. "Ultrafast structural dynamics of solvated organometallic complexes and prospects for studying coherent bi-molecular reactions," C. Rose-Petruck, presented at Workshop on Evolution and Control of Complexity, Argonne National Laboratory, Oct., 2010.

35. "Ultrafast structural dynamics of solvated organometallic complexes measured with single picosecond temporal resolution using a synchrotron x-ray source," C. Rose-Petruck, presented at Department Seminar, University of Rhode Island, Sept., 2010.

36. "Ultrafast x-ray absorption measurements of Fe(CO)5 in ethanol with single picosecond temporal resolution using a synchrotron x-ray source," C. Rose-Petruck, presented at Prospective Ultrafast Science at NSLS-II, Brookhaven National Laboratory, MD, May, 2010.

37. "Carbon capture form power plant flue gases using clathrates hydrates," C. Rose-Petruck, presented at Energy Sciences Seminar, Brown University, RI, Oct. 12, 2009.

38. "Gold Immunolabeling and x-ray imaging of Hepatocellular Carcinoma," C. Rose-Petruck, presented at Workshop of the Institute for Molecular and Nanoscale Innovation (IMNI) and the Brown Institute for Brain Science (BIBS) Brown University, RI, Sept. 28, 2009.

39. "High-resolution, holographic x-ray imaging of livers and nano-particle labeled liver tumors," C. Rose-Petruck, presented at 2nd Brown-URI Conference in Nanoscience and Nanotechnology, Brown University, RI, April 10, 2009.

40. "High resolution x-ray imaging modalities for mammography and soft tissue cancer detection," C. Rose-Petruck, presented at Engineering Division Seminar, Brown University, RI, May 21, 2009.

41. "Nanoparticle-immunolabeling of Hepatocellular Carcinoma for x-ray imaging," C. Rose-Petruck, presented at Institute for Molecular and Nanoscale Innovation Seminar, Brown University, RI, Sept. 30, 2009.

42. "Phase sensitive x-ray imaging and ultrafast molecular dynamics," C. Rose-Petruck, presented at Workshop: The Future of Ultrafast Soft X-ray Science, UXSL at Lawrence Berkeley National Laboratory, Ca, Dec. 3, 2009.

43. "Ultrafast Holographic X-ray Imaging and its Application to Picosecond Ultrasonic Wave Dynamics in Bulk Materials," C. Rose-Petruck, presented at DoE BES AMOS contractor meeting, Airlie Center, VA, Sept., 2009.

44. "Ultrafast x-ray spectroscopy of transition metal carbonyls studied with 2-ps temporal resolution at 7ID-C," C. Rose-Petruck, presented at APS Seminar, Argonne National Laboratory, Argonne, IL, Feb. 20, 2009.

45. "Bio-medical imaging with partially coherent, laser-driven plasma x-ray sources," C. Rose-Petruck, presented at APS Colloquium, Argonne National Laboratory, Argonne, IL, June 4, 2008.

46. "High resolution, phase contrast imaging with laser-driven plasma x-ray sources," C. Rose-Petruck, presented at COAST/CORAL Autumn School on Advanced Laser Science, Tokyo, Japan, Nov. 22, 2008.

47. "Laser-driven plasma x-ray sources," C. Rose-Petruck, presented at Group Seminar, Center for Molecular Movies, Niels Bohr Institute, University of Copenhagen, Copenhagen, Denmark, Dec. 11, 2008.

48. "Measuring ultrafast atomic motions during chemical reactions and cancer imaging with partially coherent x-ray sources," C. Rose-Petruck, presented at 6th Prague Workshop on Photoinduced Molecular Processes, Prague, Czech Republic, April 2, 2008.

49. "Partially coherent x-ray sources for measuring ultrafast atomic motions and cancer imaging," C. Rose-Petruck, presented at Chemistry Department Seminar, Providence College, Providence, RI, Nov. 17, 2008.

50. "Ultrafast chemical dynamics probed by x-ray absorption spectroscopy," C. Rose-Petruck, presented at Annual Meeting of the American Chemical Society, New Orleans, LA, April 6 - 10, 2008.

51. "Using partially coherent x-ray sources for measuring ultrafast atomic motions and cancer imaging," C. Rose-Petruck, presented at ALS Seminar, Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, May 5, 2008.

52. "Using spatially coherent x-ray sources for measuring ultrafast atomic motions and bio-medical imaging," C. Rose-Petruck, presented at Institute Seminar, Niels Bohr Institute, University of Copenhagen, Copenhagen, Denmark, Dec. 9, 2008.

53. "X-ray phase-sensitive bio-medical imaging with partially coherent, ultrafast laser-driven plasma x-ray sources," C. Rose-Petruck, presented at 8th Nordic Femtochemistry Meeting, Fuglso Conference Center, Denmark, Oct. 2, 2008.

54. "Chemical dynamics probed by ultrafast x-ray absorption spectroscopy," C. Rose-Petruck, presented at Frontiers in Optics / Laser Science XXIII, San Jose, Sept. 16 - 20, 2007.

55. "Development and Characterization of Replicable Tabletop Ultrashort Pulse X-ray Sources for Chemical Dynamics Research," C. Rose-Petruck, presented at DoE BES AMOS contractor meeting, Airlie Center, VA, September 13, 2006.

56. "Medical imaging and chemical dynamics measurements with high-brightness laboratory x-ray sources," C. Rose-Petruck, presented at 9th Japanese-American Frontiers of Science Symposium of the National Academy of Science and Japan Society for the Promotion of Science, Irvine, CA, December 8 - 10, 2006.

57. "Table-top X-ray Sources and Applications," C. Rose-Petruck, presented at DoE BES AMOS contractor meeting, Granlibakken Conference Center, CA, September 22, 2006.

58. "Ultrafast laser-plasma sources for 50-fs hard x-ray pulse generation and laser pump x-ray probe measurements of solvated transition metal complexes," C. Rose-Petruck, presented at Scientific Potential of High Repetition-Rate, Ultra-short Pulse ERL X-ray Source, Cornell University, Ithaca, NY, June 14 - 15, 2006.

59. "Ultrafast structural dynamics during chemical reactions and cancer imaging with partially coherent x-ray sources," C. Rose-Petruck, presented at 5th Prague Workshop on Photoinduced Molecular Processes, Prague, Czech Republic, March 12 - 14, 2006.

60. "Ultrafast structural motions during chemical reactions and cancer imaging with partially coherent x-ray sources," C. Rose-Petruck, presented at Cross-border Workshop 2006, Storrs, CT, June 1 - 3, 2006.

61. "High-resolution soft-tissue x-ray imaging with ultrasound-induced contrast enhancement," C. Rose-Petruck, presented at Laboratory of Chemical Physics, NIDDK, National Institutes of Health, Bethesda, MD, Dec., 2005.

62. "Measuring ultrafast atomic motions during chemical reactions and cancer imaging with partially coherent x-ray sources," C. Rose-Petruck, presented at Boston College, Boston, MA, Nov., 2005.

63. "Measuring ultrafast atomic motions during chemical reactions and physical transformations," C. Rose-Petruck, presented at Department Seminar, Argonne National Laboratory, Argonne, IL, July, 2005.

64. "Ultrafast laser-pump x-ray probe measurements of solvated transition metal complexes using a table-top x-ray source," C. Rose-Petruck, presented at Femtochemistry VII, Washington, DC, July 17 - 22, 2005.

65. "Ultrafast x-ray absorption fine structure measurements of solvated transition metal complexes using table-top x-ray sources," C. Rose-Petruck, presented at Chemical Society of Canada annual meeting, "Dynamic Molecular Imaging", Saskatoon, Canada, May 28-June 1, 2005.

66. "Measuring atomic motions during chemical reactions: Ultrafast laser-pump x-ray absorption probe measurements of solvated transition metal complexes," C. Rose-Petruck, presented at Stanford Linear Accelerator Center, Menlo Park, CA, Oct. 7, 2004.

67. "Observing atomic motions during chemical reactions: Ultrafast laser-pump x-ray absorption probe measurements of solvated transition metal complexes," C. Rose-Petruck, presented at University of Maryland, College Park, MD, Oct.1, 2004.

68. "Picosecond laser-pump x-ray absorption probe measurements of solvated transition metal complexes," C. Rose-Petruck, presented at Physics Colloquium, University of Connecticut, Storrs, Nov. 12, 2004.

69. "Structure of solvated iron pentacarbonyl measured by ultrafast laser driven XANES spectroscopy," C. Rose-Petruck, presented at University of Southern California, Los Angeles, CA, March 8, 2004.

70. "The structure of solvated transition metal complexes measured by ultrafast laser driven XANES spectroscopy," C. Rose-Petruck, presented at University of Colorado / JILA, Feb. 13, 2004.

71. "Structure of solvated transition metal complexes measured with ultrafast laser produced hard x-ray pulses," C. Rose-Petruck, presented at Workshop on Ultrafast X-ray Science, La Jolla, CA, April 28 - May 1, 2004.

72. "Ultrafast laser-pump x-ray absorption probe measurements of solvated transition metal complexes," C. Rose-Petruck, presented at University of Rochester, Rochester, NY, Oct. 22, 2004.

73. "Ultrafast laser-pump XAFS-probe measurements of solvated transition metal coordination complexes using a table-top x-ray source," C. Rose-Petruck, presented at Advance Photon Source workshop on time-resolved x-ray science, Lake Geneva, WI, Aug. 29 - Sept. 1, 2004.

74. "Ultrafast x-ray absorption fine structure (XAFS) measurements of solvated transition metal complexes," C. Rose-Petruck, presented at Modern Optics and Spectroscopy Series, Massachusetts Institute of Technology, Nov. 2, 2004.

75. "Ultrafast x-ray absorption fine structure (XAFS) measurements of solvated transition metal complexes using table-top x-ray sources," C. Rose-Petruck, presented at Berkeley Attosecond MURI Project, University of California, Berkeley, Dec. 1, 2004.

76. "X-ray absorption fine structure spectroscopy of solvated transition metal coordination complexes measured with table-top ultrafast laser-driven x-ray sources," C. Rose-Petruck, presented at The Ohio State University, Columbus, OH, April 19, 2004.

77. "X-ray absorption spectroscopy of solvated iron pentacarbonyl measured with an ultrafast laser-driven x-ray source," C. Rose-Petruck, presented at 227th ACS National Meeting, Anaheim, CA, March 28 - April 1, 2004.

78. "X-ray absorption spectroscopy of solvated transition metal complexes measured with ultrafast laser-driven x-ray sources," C. Rose-Petruck, presented at Gordon Conference on Multiphoton Processes, Plymouth, NH, June 13 - 18, 2004.

79. "X-ray absorption spectroscopy of solvated transition metal coordination complexes measured with table-top ultrafast laser-driven x-ray sources," C. Rose-Petruck, presented at The Woodward Lecture Series in Chemical Sciences, Harvard University, Cambridge, MA, May 6, 2004.

80. "XANES spectroscopy of solvated transition metal complexes measured with ultrafast laser-driven x-ray sources," C. Rose-Petruck, presented at 7th Symposium on Molecular Reaction Dynamics in Condensed Matter, Laguna Beach, CA, March 3 - 6, 2004.

81. "Structural deformations of solvated transition metal carbonyls and applications of ultrafast laser-driven, table-top x-ray sources," C. Rose-Petruck, presented at Division Seminar, Chemistry Division, Advanced Photon Source, Argonne National Laboratory, Argonne, IL, May, 2003.

82. "Technology tools for teaching," C. Rose-Petruck, presented at Classroom Tools, The Harriet W. Sheridan Center for Teaching and Learning, Brown University, March, 2003.

83. "Ultrafast laboratory-based x-ray sources and their applications in chemical research," C. Rose-Petruck, presented at LASE2003: Commercial and Biomedical Applications of Ultrafast Lasers V, San Jose, CA, January, 2003.

84. "Ultrafast laser-driven x-ray sources and their application to x-ray absorption spectroscopy," C. Rose-Petruck, presented at Workshop organized by Swiss Light Source, Univ. of Lausanne, and BESSY: X-ray and Electron Studies of Ultrafast Phenomena, Montreux, Switzerland, April, 2003.

85. "Ultrafast, table-top x-ray sources and their application to x-ray absorption spectroscopy," C. Rose-Petruck, presented at Measurement and Application of Coherent and Ultra-short X-rays, Annual Meeting of the American Physical Society,, Austin, TX, March, 2003.

86. "Ultrafast, Table-top X-ray Sources and Their Application to X-ray Absorption Spectroscopy," C. Rose-Petruck, presented at NSLS Users' Meeting, National Synchrotron Light Source, Brookhaven National Laboratory, Upton, NY, May, 2003.

87. "Ultrafast, tabletop x-ray sources and their application to XANES-measurements of transition metal coordination complexes," C. Rose-Petruck, presented at Laser-Generated and other Laboratory X-Ray and EUV Sources, Optics, and Applications (AM303), SPIE's 48th annual meeting, San Diego, August, 2003.

88. "X-ray absorption spectroscopy of solvated transition metal coordination complexes measured with ultrafast laser-driven x-ray sources," C. Rose-Petruck, presented at Boston College, Chestnut Hill, MA, Oct., 2003.

89. "X-ray absorption spectroscopy of transition metal coordination complexes and ultrafast laser-driven x-ray sources," C. Rose-Petruck, presented at Department Seminar, University of University of Illinois, Urbana, Il, May, 2003.

90. "Evaluating Web-based Instruction in Chemistry," C. Rose-Petruck, presented at Cost-effective Use of Technology in Teaching, Northwestern University, Nov., 2002.

91. "Observing the equilibrium structure and structural dynamics of solvated molecules with high-brightness x-ray sources," C. Rose-Petruck, presented at UConn/Yale/Wesleyan Chemical Physics Seminar, Department of Chemistry, Yale University, New Haven, CT, March, 2002.

92. "Structure of solvated Fe(CO)5: FTIR measurements, X-ray absorption measurements, and Density Functional Theory calculations," C. Rose-Petruck, presented at Department Seminar, University of New Mexico, Nov., 2002.

93. "Table-top x-ray sources for ultrafast chemical dynamics research," C. Rose-Petruck, presented at Institute Seminar, Max-Planck Institute for Quantum Optics, Garching, Germany, March, 2002.

94. "Tabletop, ultrafast x-ray sources and x-ray absorption spectroscopy in chemical research," C. Rose-Petruck, presented at NSLS Users' Meeting, National Synchrotron Light Source, Brookhaven National Laboratory, Upton, NY, April, 2002.

95. "Ultrafast laser plasma x-ray sources and x-ray absorption spectroscopy in chemical research," C. Rose-Petruck, presented at Workshop on Ultrafast X-ray Science, Advanced Photon Source, Argonne National Laboratory, Argonne, IL, June, 2002.

96. "Ultrafast lasers plasma x-ray sources and x-ray absorption spectroscopy in chemical research," C. Rose-Petruck, presented at Institute Seminar, Institute for Optics and Quantumelectronics, Friedrich-Schiller-University Jena, Germany, May, 2002.

97. "Ultrafast X-ray Absorption and Imaging Experiments," C. Rose-Petruck, presented at X-ray investigations of fast and ultrafast processes, DESY, Hamburg, Germany, March, 2002.

98. "Generation and application of high-brightness x-radiation by interaction of ultrashort high-intensity laser pulses with condensed matter," C. Rose-Petruck, presented at Material Science Seminar, Division of Engineering, Brown University, Providence R. I., April, 2001.

99. "High-brightness x-ray sources for measurements of equilibrium structures and structural dynamics of solvated molecules," C. Rose-Petruck, presented at Department Seminar, Department of Chemistry, Brandeis University, Waltham, MA, Oct., 2001.

100. "High-intensity laser-matter interaction for ultrashort pulse, hard x-ray generation," C. Rose-Petruck, presented at Symposium on Strong Field Chemistry, 2001 ACS National Meeting, San Diego, April, 2001.

101. "Observing the equilibrium structure and structural dynamics of solvated molecules using Ultrafast X-ray Absorption Spectroscopy," C. Rose-Petruck, presented at ACS New England Regional Meeting, University of New Hampshire, Durham, NH, July, 2001.

102. "Ultrafast X-ray Absorption Spectroscopy in Chemical Research: Observing molecular structures and dynamics of solvated molecules," C. Rose-Petruck, presented at Department Seminar, National Synchrotron Light Source, Brookhaven National Laboratory, Upton, NY, Nov., 2001.

103. "Ultrafast X-Ray Diffraction and X-Ray Absorption Spectroscopy," C. Rose-Petruck, presented at Ultrashort UV-,VUV-, X-Ray and IR-Generation, CLEO-Europe, Nice, France, Sept., 2000.

104. "Ultrafast X-ray Diffraction and X-ray Absorption Spectroscopy: Emerging new methods for observing physical and chemical structural dynamics on the time scale of molecular vibrations," C. Rose-Petruck, presented at ACS New England Regional Meeting, University of Connecticut, Storrs-Mansfield, CT, June, 2000.

105. "Ultrafast X-ray Diffraction and X-ray Absorption Spectroscopy: Emerging new methods for observing the motions of atoms on the time scale of molecular vibrations," C. Rose-Petruck, presented at Department Seminar, Department of Chemistry, Tufts University, Medford, MA, Jan., 2000.

106. "Observing the motions of atoms: Picosecond-milliangstrom x-ray diffraction measurements of photo induced dynamics in GaAs," C. Rose-Petruck, presented at Institute Seminar, Max-Born Institute for Nonlinear Optics and Short-time Spectroscopy, Berlin, Germany, Aug., 1999.

107. "Observing the motions of atoms: Ultrafast x-ray diffraction and x-ray absorption spectroscopy," C. Rose-Petruck, presented at Seminar, Physical Institute EP1, University Wuerzburg, Germany, Aug., 1999.

108. "Seeing atoms move: ultrafast, laboratory based x-ray sources and their applications to physical and chemical dynamics in condensed matter," C. Rose-Petruck, presented at Physics Colloquium, Department of Physics, Brown University, Providence R. I., Feb., 1999.

109. "The Ionization Ignition Model: ultrafast electron and ion dynamics in laser driven clusters," C. Rose-Petruck, presented at ITAMP workshop "Dynamics in Clusters", Institute for Nuclear Theory, University of Washington, Seattle, WA, July, 1998.

110. "Picosecond, high signal-to-noise diffraction measurements of crystal dynamics using a laboratory x-ray source," C. Rose-Petruck, presented at International Conference on Laser '98, Tucson, AZ, Dec., 1998.

111. "Ultrafast hard x-ray generation," C. Rose-Petruck, presented at Ultrafast Technical Group Meeting, OSA Annual Meeting, Baltimore, M.A., Oct., 1998.

112. "Ultrafast x-ray diffraction: Light induced structural dynamics in condensed matter measured with picosecond and 100-femtometer resolution," C. Rose-Petruck, presented at Condensed Matter Journal Club, Department of Physics, Brown University, Providence R. I., Oct., 1998.

113. "Laser plasma generated x-ray pulses and time-resolved x-ray diffraction studies of ultrafast dynamics in semiconductor crystals," C. Rose-Petruck, presented at International Workshop on Measurement of Ultrafast Dynamics of Complex Systems with Short Wavelength Radiation, Montreal, QC, Canada, July, 1997.

114. "Ultrafast x-ray diffraction with picosecond-100-femtometer resolution," C. Rose-Petruck, presented at Department A Seminar, Max-Born Institute for Nonlinear Optics and Short-time Spectroscopy, Berlin, Germany, Sept., 1997.

115. "Generation of ultrashort x-ray pulses and their use for measuring molecular dynamics," C. Rose-Petruck, presented at Department A Seminar, Max-Born Institute for Nonlinear Optics and Short-time Spectroscopy, Berlin, Germany, Sept., 1995.

116. "Generation of ultrashort, hard x-ray pulses and application to the measurement of molecular dynamics," C. Rose-Petruck, presented at Special Seminar, Institute for Experimental Physics, Free University Berlin, Berlin, Germany, Sept., 1995.

117. "Laser plasma generation of ultrashort x-ray pulses and application to the measurement of molecular dynamics," C. Rose-Petruck, presented at Special Seminar, Department of Physics, Albert-Ludwigs University Freiburg, Freiburg, Germany, Sept., 1995.

118. "Laser plasma generation of ultrashort, hard x-ray pulses and measurement of ultrafast molecular dynamics," C. Rose-Petruck, presented at Institute Seminar, Max-Planck Institute for Quantum Optics, Garching, Germany, Sept., 1995.

119. "Reactions of state-selected ions and neutrals at sub-thermal energies," C. Rose-Petruck, presented at Department Seminar, Department of Physics, Albert-Ludwigs University Freiburg, Freiburg, Germany, Jan., 1993.

6 Research Grants

6.a Current Awards and Grants

6.b Completed Awards and Grants

1. "Spectro-electrochemical and theoretical study of CO2 up-conversion mechanisms using clathrate hydrates," C. Rose-Petruck and H. Jónsson, National Science Foundation, Funding Period: 2017 - 2020, Funding Volume: $780,000.

2. "Spatial Frequency X-ray Heterodyne Imaging of Micro and Nano structured Materials and their Time-resolved Dynamics," C. Rose-Petruck, Atomic, Molecular, and Optical Sciences, Department of Energy, Funding Period: 2011 - 2014, Funding Volume: $450,000.

3. "CO2 as a Sustainable Feedstock for Chemical Commodities, Phase I," W. Bernskoetter, N. Hazari, R. Hurt, T. Palmore, A. Peterson, C. Rose-Petruck and S. Sun, National Science Foundation, Funding Period: 2012 - 2015, Funding Volume: $1,750,000.

4. "Construction of an ultrafast laser-driven x-ray source," C. Rose-Petruck, JILA-NIST-CU, National Institute of Standards and Technology, Funding Period: 2011 - 2012, Funding Volume: $45,324.

5. "Spatial Frequency X-ray Heterodyne Imaging of Micro and Nano structured Materials and their Time-resolved Dynamics," C. Rose-Petruck, Atomic, Molecular, and Optical Sciences, Department of Energy, Funding Period: 2011 - 2014, Funding Volume: $420,000.

6. "Ultrafast XAFS of ligand substitution of transition metal complexes," C. Rose-Petruck and B. Adams, APS user proposal, Advanced Photon Source, ANL, Argonne, IL, Funding Period: 2011, Funding Volume: 1 Beamtime in 2011 at ID7C; Total cost committed by APS toward this research: 144 hours x ~$407/h = $58,608.

7. "Instrumentation for structural dynamics measurements of chemical reactions with 1-ps temporal resolution," C. Rose-Petruck, B. Adams, M. Chollet, B. Ahr and C. Laperle, APS Partner-user proposal 22143, Advanced Photon Source, ANL, Argonne, IL, Funding Period: 2011-2012, Funding Volume: $70,200 for research

instrument plus 10% of all beamtime at ID7 (=1000 hours x ~$407/h) -> Total cost committed by APS toward this research: $477,200.

8. "Ultrafast dynamics of clathrate hydrates for carbon capture and fuel cell gas storage," C. Rose-Petruck, Brown University Energy Initiative, Department of Energy, Funding Period: 2010 - 2011, Funding Volume: $62,714.

9. "Ultrafast EXAFS of ligand substitution of transition metal carbonyls," C. Rose-Petruck and B. Adams, APS user proposal, Advanced Photon Source, ANL, Argonne, IL, Funding Period: 2010, Funding Volume: 3 Beamtimes in 2010 at ID7C; Total cost committed by APS toward this research: 400 hours x ~$407/h = $162,800.

10. "X-ray study of composite materials containing aligned nano brushes," C. Rose-Petruck, S. C. Yang and A. Shukla, Institute for Molecular and Nanoscale Innovation Brown University, National Institute of Standards and Technology, Funding Period: 2011, Funding Volume: $61,234.

11. "Clathrate Hydrate Research," C. Rose-Petruck, Brown University Energy Initiative, Department of Energy, Funding Period: 2009 - 2010, Funding Volume: $42,944.

12. "Clathrate hydrates for gas storage, transport, and sequestration," C. Rose-Petruck, The Charles Stark Draper Laboratory, Inc., Funding Period: 2009-2010, Funding Volume: $40,827.

13. "High-resolution x-ray imaging of tumor angiogenesis," C. Rose-Petruck, G. Diebold and J. Wands, Funding Program: , Brown University, Funding Period: 2008-2009, Funding Volume: $90,000.

14. "Ultrafast EXAFS of ligand substitution of transition metal carbonyls," C. Rose-Petruck and B. Adams, APS user proposal, Advanced Photon Source, ANL, Argonne, IL, Funding Period: 2009, Funding Volume: 2 Beamtimes in 2009 at ID7C; Total cost committed by APS toward this research: 288 hours x ~$407/h = $117,216.

15. "Ultrafast Photodissociation and Ligand Exchange in Solvated Transition-metal Carbonyls: Time-resolved EXAFS Studies," C. Rose-Petruck and R. Schoenlein, ALS user proposal, Advanced Light Source, LBNL, Berkeley, CA, Funding Period: 2009, Funding Volume: Beamtime in 2009 at BL6.0.1 .

16. "Ultrafast Photodissociation and Ligand Exchange of Solvated Transition-metal Carbonyls: Time-resolved EXAFS Studies at the advanced Photon Source, 7ID-C, and the Advanced Light Source, Beamline 6.0.1.2," C. Rose-Petruck, Atomic, Molecular, and Optical Sciences, Department of Energy, Funding Period: 2009 - 2010, Funding Volume: $49,452.

17. "Ultrafast holographic x-ray imaging and its application to picosecond ultrasonic wave dynamics in bulk materials," C. Rose-Petruck, Atomic, Molecular, and Optical Sciences, Department of Energy, Funding Period: 2008 - 2011, Funding Volume: $450,000.

18. "Development of Vacuum Compatible Deformable Mirrors for a Terawatt Laser System," C. Rose-Petruck, Development Project, Argonne National Laboratory, Funding Period: May 2005 - May 2006, Funding Volume: $75,000.

19. "Development of table-top, hard x-ray sources for structural dynamics measurements of chemical processes," C. Rose-Petruck, Basic Energy Research Program, Department of Energy, Funding Period: Aug. 2003 - Nov.. 2007, Funding Volume: $420,000.

20. "High Resolution X-ray Phase Contrast Imaging with Acoustic Tissue-Selective Contrast Enhancement," G. Diebold and C. Rose-Petruck, Department of Defense Breast Cancer Imaging Research Program, Department of the Army, Funding Period: June 2004 - June 2008, Funding Volume: $500,000.

21. "Ligand substitution dynamics of solvated iron pentacarbonyl measured by ultrafast x-ray absorption spectroscopy," C. Rose-Petruck, National Science Foundation, Funding Period: 2004 - 2007, Funding Volume: $490,000.

22. "Ultrafast ligand substitution dynamics of solvated Ni(CO)4 measured with the Sub Picosecond Particle Source," C. Rose-Petruck, Basic Energy Research Program, Department of Energy, Funding Period: 2004, Funding Volume: $50,000.

23. "Teaching, learning, and scholarship in the digital age: How information technology is changing the work on universities," M. Joukowsky, D. Reville, C. Rose-Petruck, K. Sibley, K. Smith, S. Smulyan, K. Spoehr, T. Tullis, S. Waryn and T. Webb, Wayland Collegium Study Group Grant, Wayland Collegium, Brown University, Funding, Funding.

24. "Context-rich interactive science teaching and learning system," T. Webb, D. Cutts, N. S. Pollard, S. M. Swartz, D. M. Targan, D. Mierke, J. Rankin, R. Pelcovits, J. J. Valles and C. Rose-Petruck, CCLI - Educational Materials Development, The National Science Foundation, Funding, Funding.
25. "Evaluating Web-based Instruction in Chemistry," C. Rose-Petruck, P. M. Weber, J. D. Doll and J. Tyler, Cost-effective Use of Technology in Teaching Initiative, The Andrew W. Mellon Foundation, Funding Period: Jan. 2001 - Jan. 2005, Funding Volume: $400,000.
26. "Ultrafast extended x-ray absorption fine structure spectroscopy for measuring molecular dynamics of chemical reactions in solution," C. Rose-Petruck, Research Innovation Award, Research Corporation, Funding Period: May 2000 - May 2005, Funding Volume: $35,000.
27. "Ultrafast x-ray absorption spectroscopy of chemical dynamics: Photolysis and cage recombination of transition metal carbonyls in solution," C. Rose-Petruck, Salomon Faculty Research Award, Brown University, Funding Period: June 1999 - June 2000, Funding Volume: $15,000.
28. "Ultrafast x-ray imaging of molecular dynamics in solution; a research program embedded into an environment that enhances students' learning," C. Rose-Petruck, CAREER Award, The National Science Foundation, Funding Period: Jan. 2000 - Jan. 2004, Funding Volume: $420,000.
29. "Laser-induced ultrafast phase-transitions in group-iv semiconductors: An efficient, single shot crosscorrelator for hard x-rays with 10 fs temporal resolution," C. Rose-Petruck, Kent R. Wilson, Funding, Funding.

6.c Pending Grants

7 Services

7.a University Services

1. Admission Committee, 2022 - present.

2. Faculty Executive Committee, 2020 - 2022.

3. Instrument Committee, 2019 - present.

4. Faculty hiring committee member, 2019 - 2020.

5. Curriculum Committee, 2018 - 2020.

6. Faculty hiring committee member, 2015.

7. Physical Chemistry Tea Session, 2015.

8. Safety Committee, 2012 - 2019.

9. Contact person between the Draper Laboratory, Inc. and Brown University,Alliance for Smart Energy Innovation, 2010 - 2011.

10. Brown University Laser Safety Subcommittee, 2008.

11. Lecturer hiring committee chair, 2008.

12. Chair of the committee for evaluation of the gas and liquid nitrogen consumption, 2007.

13. Admission Committee, 2005 - 2015.

14. Freshman Advisor,2007: 6 freshman advisees, 8 sophomore advisees, 2005 - 2009.

15. Contributed to: Moving Out in Front - Advancing Brown Through Technology, Jan., 2002.

16. FACC-subcommittee on instructional technology, Sept., 2001 - 2003.

17. FACC-subcommittee on distance learning, Fall, 2001.

18. Ad-Hoc faculty committee on instructional technology, Fall, 2000.

19. New Chemistry Department Web-site, 2000.

20. Physical Chemistry Tea Session, Sept., 1998 - 2005.

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7.b Professional Services

1. Reviewer of the Institute for Photon Ultrafast Laser Science and Engineering (PULSE), Stanford University, April, 2015.

2. Member of the International scientific advisory committee (ISAC), Extreme Light Infrastructure (ELI) European Project, ELI-Beamlines Facility, 2011 - 2015.

3. Program committee, 2012 Banff Meeting on Structural Dynamics, 2011.

4. Member, APS User Proposal Review Panel, Advanced Photon Source, Argonne National Laboratory, 2011.

5. Program Reviewer, Deutsche Forschungs Gemeinschaft (German Science Foundation), Program: Nanoscale Photonic Imaging, SFB 755, Jan., 2011.

6. Chair of the Chemistry Panel, Laser Coherent Light Source (LCLS) Proposal Review Panel, Stanford Linear Accelerator Center, 2011.

7. Chair of the CDR Panel, Ultrafast Sciences, Advanced Photon Source Upgrade Conceptual Design Review, Argonne National Laboratory, Dec., 2010.

8. Chair of the Chemistry Panel, LCLS Proposal Review Panel, Stanford Linear Accelerator Center, Sept, 2010.

9. Co-organizer, Workshop: Are phase-contrast and diffraction imaging/microscopy ready for biology and medicine?, Advanced Photon Source User Meeting, February, 2010.

10. Program committee, Banff Meeting on Structural Dynamics, Feb., 2009.

11. Advisory group participant, Carbon capture and conversion, Advanced Research Projects Agency—Energy (ARPA-E), Oct. 29, 2009.

12. NSF-Center review panel member, Engineering Research Center (ERC) on Extreme Ultraviolet (EUV) at Colorado State Univ. in partnership with Univ. of Colorado, Univ. of Calif., Berkeley, and Lawrence Berkeley National Laboratory National Science Foundation, May, 2009.

13. Member of the board of scientific counselors, Review the intramural research programs at the NHLBI, National Heart, Lung, Blood Institute (NHLBI), June 10-12, 2009.

14. Chair of the External Advisory Board, Center for Photon Ultrafast Laser Science and Engineering (PULSE), Stanford Linear Accelerator Center, April, 2008 -2012.

15. NSF-Center review panel member, Engineering Research Center (ERC) on Extreme Ultraviolet (EUV) at Colorado State Univ. in partnership with Univ. of Colorado, Univ. of Calif., Berkeley, and Lawrence Berkeley National Laboratory National Science Foundation, May, 2008.

16. Symposium organizer, American Physical Society, Annual Meeting, Symposium: Ultrafast Dynamics probed with X-ray and Electron Pulses, March, 2007.

17. Program Reviewer, Deutsche Forschungs Gemeinschaft (German Science Foundation), Program: SFB775 - Photonic imaging on the nanometer scale, March, 2007.

18. NSF-Center review panel member, Engineering Research Center (ERC) on Extreme Ultraviolet (EUV) at Colorado State Univ. in partnership with Univ. of Colorado, Univ. of Calif., Berkeley, and Lawrence Berkeley National Laboratory National Science Foundation, May, 2007.

19. Program Reviewer, Deutsche Forschungs Gemeinschaft (German Science Foundation), Program: Ultrashort Pulse X-ray Methods, February, 2006.

20. NSF-Center review panel member, Engineering Research Center (ERC) on Extreme Ultraviolet (EUV) at Colorado State Univ. in partnership with Univ. of Colorado, Univ. of Calif., Berkeley, and Lawrence Berkeley National Laboratory National Science Foundation, May, 2006.

21. Sector review panel member, Basic Energy Sciences Synchrotron Radiation Center (BESSRC) Collaborative Access Team (CAT) at Sector 11 at the Advanced Photon Source (APS), Argonne National Laboratory, March, 2005.

22. Program Reviewer, Deutsche Forschungs Gemeinschaft (German Science Foundation), Program: Ultrashort Pulse X-ray Methods, February, 2004.

23. Session chair, Workshop on Ultrafast X-ray Science, Session: Future Ultrafast X-ray Applications, April, 2004.

24. Session chair, 225th ACS National Meeting, Conference: Computational Inorganic and Organometallic Chemistry, March, 2003.

25. Technical program committee member, Applications of High Field & Short Wavelength Sources X Meeting, Oct., 2003.

26. Session chair, Gordon Conference "X-ray Physics", Session: Ultrafast X-ray Applications, July, 2003.

27. Session chair, Photonics West, Conference: Commercial and Biomedical Applications of Ultrafast Lasers V, PW03L High-Power Lasers and Applications, January, 2003.

8 Academic Honors

1. "2011 JILA Visiting Fellow", JILA / University of Colorado / National Institute of Standards and Technology, Boulder, CO, 2011.

2. "Master of Arts, ad eundem", Brown University, 2006.

3. "Manning Assistant Professorship", Chaired Assistant Professorship, 2002.

4. "Ultrafast x-ray absorption spectroscopy of chemical dynamics: Photolysis and cage recombination of transition metal carbonyls in solution", Salomon Faculty Research Award, Brown University, 1999.

5. "Ultrafast extended x-ray absorption fine structure spectroscopy for measuring molecular dynamics of chemical reactions in solution", Research Innovation Award, Research Corporation, 1999.

6. "Ultrafast x-ray imaging of molecular dynamics in solution; a research program embedded into an environment that enhances students' learning", CAREER Award, The National Science Foundation, 1999.

9 Teaching

9.a Teaching Accomplishments (last 5 years)

1. Chem. 0330, "Equilibrium, Rate, Structure", Fall, 2022, Activity: Taught lecture, Enrollment: 137.

2. Chem. 1160, "Physical Chemistry Laboratory", Spring, 2022, Activity: Taught laboratory; experiment notes and manuals were published on MyCourses, Enrollment: 7.

3. Research advisor, "2022, Enrollment: 3 Ph.D. students (Brown University).

4. Chem. 2010, "Thermodynamics", Fall, 2021, Activity: Taught lecture, Enrollment: 14.

5. Research advisor, "2021, Enrollment: 4 Ph.D. students (Brown University).

6. Chem. 0330, "Equilibrium, Rate, Structure", Fall, 2020, Activity: Taught lecture, Enrollment: .

7. Chem. 2020, "Statistical Mechanics", Spring, 2020, Activity: Taught lecture, Enrollment: 7.

8. Research advisor, "2020, Enrollment: 6 Ph.D. students (Brown University).

9. Chem. 0330, "Equilibrium, Rate, Structure", Spring, 2019, Activity: Taught lecture, Enrollment: 98.

10. Chem. 1620B, "Laser technology and laser spectroscopy", Fall, 2019, Activity: Taught lecture, Enrollment: 11.

11. Research advisor, "2019, Enrollment: 6 Ph.D. students (Brown University).

12. Chem. 0330, "Equilibrium, Rate, Structure", Spring, 2018, Activity: Taught lecture, Enrollment: 187.

13. Chem. 2010, "thermodynamics", Fall, 2018, Activity: Taught lecture, Enrollment: 11.

14. Research advisor, "2018, Enrollment: 6 Ph.D. students (Brown University).

15. Chem. 0330, "Equilibrium, Rate, Structure", Spring, 2017, Activity: Taught lecture, Enrollment: 209.

16. Chem. 1620B, "Spectroscopy: X-ray science for microscopy and chemical dynamics measurements", Fall, 2017, Activity: Taught lecture, Enrollment: 10.

10 Miscellaneous

10.a Professional Societies

American Chemical Society
American Physical Society

10.b Other Activities

Medic in the German disaster relief, civil defense system, 1982 - 1992

First Mate on the "HYS Flensburg", Glűcksburg, Germany, 1987.