Stephen P. Cramer, Advanced Light Source Professor, UC Davis, *emeritus*

Present Position: Senior Research Scientist, SETI Institute, Mountain View, CA 94043 USA

Education

1969-1973 Williams College, Williamstown, MA: B.A. *cum laude* in Chemistry – ΦBK, Lehman Scholar
1973-1977 Stanford University, Stanford, CA: Ph.D. Chemistry – IBM Pre-doctoral Fellow
1977-1978 California Institute of Technology: Post-doc – NIH Post-doctoral Fellow with Prof. Harry Gray

Professional Career

1991 – Advanced Light Source Professor, University of California – Davis, CA, now *emeritus* member: Applied Science, Biophysics, and Chemistry Graduate groups
1991 – 2016 Senior Faculty Scientist, Physical Biosciences Division, Lawrence Berkeley Lab, Berkeley, CA
2018 Visiting Professor, Williams College
2002 & 2004 Visiting Professor, University of California – Berkeley, CA
2003 & 2006 Visiting Scholar, Stanford University, Stanford, CA
2003 Visiting Scientist, Advanced Photon Source – Argonne National Lab
2001 & 2012 Visiting Adjunct Professor, Williams College, Williamstown, MA
1995 Visiting Professor, Massachusetts Institute of Technology, Cambridge, MA
1994 –1995 SSRL Adjunct Professor, Stanford University, Stanford, CA
1990 –2000 Adjunct Professor, Department of Chemistry, Louisiana State University
1988 –1990 Physicist, National Synchrotron Light Source, Upton, NY
1986 –1988 Member of Professional Staff, Schlumberger-Doll Research, Ridgefield, CT
1985 –1986 Chair, SSRL Users' Organization
1978 –1986 Research, Staff, … Senior Staff Chemist & Group Head, Exxon Research, Annandale, NJ

Honors

2010 American Chemical Society "Spectrochemical Analysis" Award
2012 International X-Ray Absorption Society "Edward Stern Outstanding Achievement Award"
2012 Xiamen University – Lu Jiaxi Lectureship
2013 New York Society for Applied Spectroscopy Gold Medal
2013 American Association for the Advancement of Science Fellow
2014 Humboldt Foundation Research Award
2016 Einstein Visiting Fellow, Technische Universität Berlin
2018 Eastern Analytical Society Award for Outstanding Achievements in Vibrational Spectroscopy

Organization of Conferences

2006 Vice Chair, Iron-Sulfur Enzymes Gordon Research Conference, New London, CT
2008 Chair, Iron-Sulfur Enzymes Gordon Research Conference, New London, CT
2015 Chair, 19th International Congress on Nitrogen Fixation, Asilomar, CA

External Committees & Boards

International X-Ray Absorption Society Executive Committee
APS Sector-3 Advisory Committee
International Congress on Nitrogen Fixation Steering Committee
Editorial Board, *Journal of Inorganic Biochemistry*

Mentoring Prof. Cramer has mentored more than 40 graduate students and post-docs.
(Past Students and postdocs**)**

Bergmann, Uwe, Interim Director - LCLS-SLAC; Braun, Artur: EMPA, Switzerland; **Bryant, Craig:** RheoSense Inc., San Ramon, CA; **Carpenter, Matthew H:** UC Davis; **Christiansen, Jason:** HistoRX, New Haven, CT; Chen, Jie: Miradia Corp., San Jose, CA; Deb, Aniruddha: U. Michigan; Demuez, Marie: IMDEA Energia, Spain; **Drury, Owen B.**: Lawrence Livermore Lab; Eidsness, Marlie: Bayer HealthCare; Flank, Anne-Marie: Synchrotron SOLEIL, Friedrich, Stephan: Lawrence Livermore National Lab; Fu, Juxia: Canadian Light Source; Funk, Tobias: UC San Francisco; George, Graham: U. Saskatchewan; George, Simon: UC Davis; **Gee, Leland**: post-doc, Stanford; **Glatzel, Pieter**: European Synchrotron Radiation Facility; **Grady-Smith, Cela**: NetSuite, San Mateo, CA; **Grush, Melissa** N/A; **Gu, Weiwei**: LBNL; **Guo, Yisong**: Carnegie-Mellon; Jacquamet, Lillian: (deceased); Miller, Lisa: NSLS, Brookhaven Lab; Mitra, Devrani: Ass't Prof. Presidency University, Kolkata, India; Mitra-Kirtley, Sudipa: Professor, Rose-Hulman; Peng, Gang, N/A; Piamonteze, Cinthia: Swiss Light Source; **Pham, Cindy**: post-doc, LBNL; **Ralston, Corie**: LBNL; Randall, Clay: ?; **Scott, Aubrey D.**, Intel; Smith, Matt: Calera Corp., San Jose, CA; van Elp, J. Hiroshima Synchrotron; Wang, Hong-Xin: UC Davis; **Wang, Xin:** IBM Almaden Research, CA; **Weiss, Brenda:** N/A; **Xiao, Yuming**: APS, Argonne National Lab; **Yan, Lifen**: post-doc Purdue

Publications

Prof. Cramer has more than 250 peer-reviewed publications, available at:
http://chemgroups.ucdavis.edu/~cramer/Publications.html

The 11 most recent papers include:

[1.] "Reaction Coordinate Leading to H_2 Production in [FeFe] Hydrogenase Identified by Nuclear Resonance Vibrational Spectroscopy and Density Functional Theory", Pelmenschikov, V.; Birrell, J. A.; Pham, C. C.; Mishra, N.; Wang, H. X.; Sommer, C.; Reijerse, E.; Richers, C. P.; Tamasaku, K.; Yoda, Y.; Rauchfuss, T. B.; Lubitz, W.; Cramer, S. P. *J. Am. Chem. Soc.*, **2017**, *139*, 16894-16902.
[2.] "Ultrafast Charge-Transfer Dynamics in the Iron–Sulfur Complex of *Rhodobacter capsulatus* Ferredoxin VI", Mao, Z.; Carroll, E. C.; Kim, P. W.; Cramer, S. P.; Larsen, D. S. *J. Phys. Chem. Lett.*, **2017**, *8*, 4498-4503.
[3.] "Enzymatic and spectroscopic properties of a thermostable [NiFe]-hydrogenase performing H_2-driven NAD^+-reduction in the presence of O_2", Preissler, J.; Wahlefeld, S.; Lorent, C.; Teutloff, C.; Horch, M.; Lauterbach, L.; Cramer, S. P.; Zebger, I.; Lenz, O. *Biochim. Biophys. Acta*, **2018**, *1859*, 8-18.
[4.] "Sterically Stabilized Terminal Hydride of a Diiron Dithiolate", Carlson, M. R.; Gray, D. L.; Richers, C. P.; Wang, W.; Zhao, P.-H.; Rauchfuss, T. B.; Pelmenschikov, V.; Pham, C. C.; Gee, L. B.; Wang, H.; Cramer, S. P. *Inorg. Chem.*, **2018**, *57*, 1988-2001.
[5.] *NRVS for Fe in Biology: Experiment and Basic Interpretation*, Gee, L. B.; Wang, H. X.; Cramer, S. P., Ed.**, 2018**; Vol. 599.
[6.] "Cluster-Dependent Charge-Transfer Dynamics in Iron-Sulfur Proteins", Mao, Z.; Liou, S. H.; Khadka, N.; Jenney, F. E.; Goodin, D. B.; Seefeldt, L. C.; Adams, M. W. W.; Cramer, S. P.; Larsen, D. S. *Biochemistry*, **2018**, *57*, 978-990.
[7.] "Terminal Hydride Species in [FeFe]-Hydrogenases are Vibrationally Coupled to the Active Site Environment", Pham, C. C.; Mulder, D. W.; Pelmenschikov, V.; King, P. W.; Ratzloff, M. W.; Wang, H.; Mishra, N.; Alp, E. E.; Zhao, J.; Hu, M. Y.; Tamasaku, K.; Yoda, Y.; Cramer, S. P. *Angew. Chem. Int. Ed.*, **2018**, *130*, 10605-10609.
[8.] "High-Frequency Fe–H Vibrations in a Bridging Hydride Complex Characterized by NRVS and DFT", Pelmenschikov, V.; Gee, L. B.; Wang, H.; MacLeod, K. C.; McWilliams, S. F.; Skubi, K. L.; Cramer, S. P.; Holland, P. L. *Angew. Chem. Int. Ed.*, **2018**, *57*, 9367-9371.
[9.] "Scientific Opportunities with an X-ray Free-Electron Laser Oscillator", Adams, B.; Aeppli, G.; Baron, A. Q. R.; Bucksbaum, P.; Chumakov, A.; Corder, C.; Cramer, S. P.; Ding, Y.; Evers, J.; Frisch, J.; Fuchs, M.; Grübel, G.; Harris, S.; Hastings, J.; Heyl, C.; Holberg, L.; Huang, Z.; Ishikawa, T.; Jones, R. J.; Kaldun, A.; Kim, K.-J.; Kolodziej, T.; Krzywinski, J.; Li, Z.; Liao, W.-T.; Lindberg, R.; Madsen, A.; Maxwell, T.; Monaco, G.; Nelson, K.; Palffy, A.; Porat, G.; Qin, W.; Raubenheimer, T.; Reis, D. A.; Röhlsberger, R.; Santra, R.; Schoenlein, R.; Schünemann, V.;

Shpyrko, O.; Shvydko, Y.; Shwartz, S.; Singer, A.; Sinha, S.; Sutton, M.; Tamasaku, K.; Wille, H.-C.; Yabashi, M.; Ye, J.; Zhu, D. *J. Syn. Rad.*, **2019**, *submitted*.
[10.] "Vibrational Modes of a [4Fe-4Te] Cluster from Two Points of View: Insights from ^{57}Fe and ^{125}Te Nuclear Resonance Vibrational Resonance", Wittkamp, F.; Mishra, N.; Wang, H.; Wille, H.-C.; Cramer, S. P.; Apfel, U.-P.; Pelmenschikov, V. *Chem. Sci.*, **2019**, submitted.
[11.] "Vibrational and electronic characterization of a diiron bridging hydride complex – a model for hydrogen catalysis", Gee, L. B.; Pelmenschikov, V.; Wang, H.; Mishra, N.; Liu, Y.-C.; Yoda, Y.; Tamasaku, K.; Kaupp, M.; Chiang, M.-H.; Cramer, S. P. *Angew. Chem. Int. Ed.*, **2019**, *submitted*.

Invited Talks During First Two Years of Fellowship

2017 –
January 5 – "NRVS Spectroscopy of Hydrogenase – New Spectroscopy of Enzyme Intermediates", Presidency University, Kolkata, India,
January 9 – "NRVS Spectroscopy of Hydrogenase – New Spectroscopy of Enzyme Intermediates", Keynote Lecture, SABIC – Symposium on Advanced Bioinorganic Chemistry, Kolkata, India
April 4 – "NRVS of Hydrogenase – New Spectroscopy of Enzyme Intermediates", Symposium on Spectroscopic Elucidation of Metalloenzyme Mechanism, ACS National Meeting, San Francisco, CA
May 26 – "NRVS Spectroscopy of Hydrogenase –New Spectroscopy of Hydride Intermediates", CanBIC-6, Parry Sound, Ontario, Canada
June 8 – "NRVS of Hydrogenase – Why the Fuss About Hydride Wagging?", Max Planck Institute for Chemical Energy Conversion, Mulheim, Germany
August 29 – "Hydrogenase Vibrational Spectroscopy with NRVS – The Merits of Big Photons for Studying Small Vibrations", Department of Chemistry, University of Utrecht, Utrecht, Netherlands
September 5 – "Hydrogenase Vibrational Spectroscopy with NRVS – The Merits of Big Photons for Studying Small Vibrations", Inorganic Biochemistry Discussion Group, School of Chemistry, University of East Anglia, Norwich, England
October 5 – "NRVS of hydrogenase – Why the fuss about little bumps & squiggles?", Department of Chemistry, University of Alabama, USA

2018 –
January 16—17 – "X-Ray Spectroscopy and Synchrotron Radiation – A Block Course", Technische Universität, Berlin, Germany – a two-day class that included examples from work at Spring-8,
March 20 – "NRVS of hydrogenase – Why the fuss about little bumps & squiggles?", ACS National Meeting–Award Symposium for Thomas Rauchfuss, New Orleans, LA USA
April 27 – "Synchrotron Radiation and a Hydrogen Economy — A Surprising Connection", Williams Department of Chemistry, Williams College, Williamstown, MA USA
July 10 – "NRVS of hydrogenase – Why the fuss about little bumps & squiggles?", Department of Chemistry – Biochemistry, University of Kaiserslautern, Kaiserslautern, Germany
July 11 – "Synchrotron Radiation & X-Ray Spectroscopy" "1. Synchrotron Radiation", "2. Applications", a pair of master classes, University of Kaiserslautern, Kaiserslautern, Germany
September 12 – "NRVS of hydrogenase – Why the fuss about little bumps & squiggles?", Keynote Lecture, NSRRC Users' Meeting Workshop, Tsinchu, Taiwan
September 13 – "Vibrational Spectroscopy of Hydrogen-Processing Enzymes using Mössbauer Photons — Why the Fuss About Little Bumps and Squiggles?", National Tsing Hua University, Hsinchu City, Taiwan
September 14 – "Vibrational Spectroscopy of Hydrogen-Processing Enzymes using Mössbauer Photons — Why the Fuss About Little Bumps and Squiggles?", Institute of Chemistry, Academia Sinica, Taipei, Taiwan
November 14 – "Synchrotron Radiation and a Hydrogen Economy – A Surprising Connection", Award Talk at Eastern Analytical Society Symposium, Princeton, NJ
December 7 – "Nuclear Spectroscopy with Synchrotron Radiation — Applications to Hydrogen Processing Enzymes and Inorganic Materials", Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China