Steven T. Frey

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Education and Training

- Postdoctoral Fellow with Kenneth D. Karlin, Johns Hopkins University, Sept. 1994 - Aug. 1996
- Postdoctoral Fellow with William DeW. Horrocks, Jr., Penn State University, Jan. 1994 - Sept. 1994
- Ph.D. Chemistry, December 1993 (conferred May 1994), Penn State University, University Park, PA, Dissertation Title: "An Investigation of the Structural and Spectroscopic Properties of Lanthanide (III) Complexes of Biological Relevance." Research Advisor: William DeW. Horrocks, Jr.
- B.S. Chemistry, May 1987, Ithaca College, Ithaca, NY.

Professional Experience

- June 2003 - present: Associate Professor, Skidmore College
- Sept. 2018 – May 2019: Director of the Honors Forum, Skidmore College
- June 2006 – December 2008: Chair of the Chemistry Department, Skidmore College
- Sept. 1997 - May 2003: Assistant Professor, Skidmore College
- Sept. 1996 - Aug. 1997: Visiting Assistant Professor, Skidmore College

Courses Taught

- CH 101/103 Fundamentals of Chemistry with and without Lab
- CH 105 and 105H Chemical Principles I (regular and honors) lecture and lab
- CH 106 Chemical Principles II
- CH 107H Intensive General Chemistry Honors lecture and lab
- CH 111/112 Environmental Chemistry with and without Lab
- CH 115 Fundamentals of Chemistry
- CH 125 Chemical Principles
- CH 207H Inorganic Compounds and Materials lecture and lab (intermediate topics course)
- CH 214 Descriptive Inorganic Chemistry lecture and lab
- CH 313/314 Inorganic Chemistry with and without lab
- CH 315 Advanced Inorganic Chemistry
- CH 351 Special Topics in Chemistry (Bioinorganic Chemistry)
- CH 371/372 Research in Chemistry
- CH 377/378 Senior Seminar in Chemistry and Biochemistry
- ES 105 (formerly ES 101) Field Studies in Environmental Science and lab
- SSP-100 The Molecular Frontier (Freshman seminar course)
- SSP-100 If the Elements Could Talk (Freshman seminar course)
- LSI Liberal Studies I

Committees

- Honors Forum Council F'16 to Present (Interim Director F'18-S'19)
- Radiation Safety Committee, F'06 to S'14
- S^3M Advisory Committee, F'07 to F'08 (Chair F'07-S'08)
- Faculty Development Committee, F'03 to S'05 (Chair F'04-S'05)
- Athletic Council, F'05 to S'08 (Chair F'06-S'07) and S'14

Committees Continued

- Periclean Executive Committee, F'03 to S'05
- Environmental Studies Steering Committee, F'04
- Health Professions Advisory Committee, F'02 to S'04
- Education Committee of the Eastern NY Section of the American Chemical Society, F'97 to S'02
- Self-Determined Major Subcommittee of the Curriculum Committee, F'97-F'00 (Chair F'98-F'00) and F'02 to S'06
- Environmental Studies Curriculum Development Study Group, Summer 1999
- Environmental Studies Future Workshop Group, Summer 2000
- Skidmore Microscopy Imaging Center Planning Committee, S'02 to S'06
- Departmental Committees: Assessment, Awards, Safety, and NMR

Professional Associations and Memberships

- Reviewer for *Inorganic Chemistry*, *Journal of Physical Chemistry*, *Langmuir*, *The Journal of Inorganic Biochemistry*, *Industrial & Engineering Chemistry Research*, *Colloids and Surfaces*, *Composite Interfaces*, *New Journal of Chemistry*, and *The Chemical Educator*
- Project Kaleidoscope Faculty for the 21st Century, Class of 1997
- American Chemical Society
- Council on Undergraduate Research
- National Center for Faculty Development and Diversity

Publications (* indicates undergraduate collaborators)

- Steven T. Frey, Jason Li*, Manpreet Kauer, and Jerry P. Jasinski. "Crystal structure of a mononuclear copper(II) complex with 2-methoxy-N,N -bis(quinolin-2-ylmethyl)ethylamine (DQMEA)," *Acta Crystallographica*, **2018**, *E74*, 1138-1141. https://doi.org/10.1107/S2056989018010319

- Steven T. Frey, Hillary A. Ramirez*, Manpreet Kauer, and Jerry P. Jasinski. "Crystal structure of a seven-coordinate manganese(II) complex with tris(pyridin-2-ylmethyl)amine (TMPA)," *Acta Crystallographica*, **2018**, *E74*, 1075-1078. https://doi.org/10.1107/S2056989018009611

- Steven T. Frey, Stephanie L. Guilmet*, Richard G. Egan III*, Alyssa Bennett*, Sarah R. Soltau*, and Richard C. Holz. "Immobilization of the Aminopeptidase from *Aeromonas proteolytica* on Mg^{2+}/Al^{3+} Layered Double Hydroxide Particles," *ACS Applied Materials and Interfaces*, **2010**, *2*, 2828-2832.

- Michelle W. Frey, Steven T. Frey, and Sarah R. Soltau*. "Exploring the pH Dependence of L-leucine-*p*-nitroanilide Cleavage by Aminopeptidase *Aeromonas Proteolytica*: A Combined Buffer-Enzyme Kinetics Experiment for the General Chemistry Laboratory," *The Chemical Educator*, **2010**, *15*, 117-120.

- Steven T. Frey, William R. Moomaw, Judith A. Halstead, Caitlin W. Robinson*, Kimberly A. Marsella, and John J. Thomas. "Home Energy Conservation Exercise," *Journal of Geoscience Education*, **2003**, *51*, 521-526.

- Steven T. Frey, Benjamin M. Hutchins*, Brian J. Anderson*, Teresa K. Schreiber*, and Michael E. Hagerman. "Catalytic Hydrolysis of 4-Nitrophenyl Phosphate by Lanthanum(III)-Hectorite," *Langmuir*, **2003**, *19*, 2188-2192.

- Steven T. Frey and Gregory L. Wrubel*. "The Geometry of Crystalline Substances," *New York State Mathematics Teachers Journal*, **2003**, *53*, 7-11.

Publications (* indicates undergraduate collaborators) – continued

- Steven T. Frey, Narasappa, N. Murthy, Susan T. Weintraub, Laurence K. Thompson, and Kenneth D. Karlin. "Hydrolysis of Unactivated Esters and Hydration of Acetonitrile by a Hydroxo-Dicopper(II) Complex," *Inorganic Chemistry*, **1997**, *36*, 956-957.

- Michelle W. Frey, Steven T. Frey, William DeW. Horrocks, Jr., and Stephen J. Benkovic. "Elucidation of the Metal Binding Properties of the Klenow Fragment of *E. coli* Polymerase I and Bacteriophage T4 DNA Polymerase by Lanthanide(III) Luminescence Spectroscopy," *Chemistry and Biology*, **1996**, *3*, 393-403.

- Steven T. Frey, Helen J. Sun, Narasappa, N. Murthy, and Kenneth D. Karlin. "A New Trinuclear Copper Complex and its Reactions with Plasmid DNA," *Inorganica Chimica Acta*, **1996**, *242*, 329-338.

- Steven T. Frey and William DeW. Horrocks, Jr. "On Correlating the Frequency of the $^7F_0 \rightarrow {}^5D_0$ Transition in Eu^{3+} Complexes with the Sum of 'Nephelauxetic Parameters' for all of the Coordinating Atoms," *Inorganica Chimica Acta*, **1995**, *229*, 383-390.

- Steven T. Frey, Meng Lian Gong, and William DeW. Horrocks, Jr. "Synergistic Coordination in Ternary Complexes of Eu^{3+} with Aromatic ß-Diketone Ligands and 1,10-Phenanthroline," *Inorganic Chemistry*, **1994**, *33*, 3229-3234.

- Steven T. Frey, C. Allen Chang, Joan F. Carvalho, Aravamutham Varadarajan, Lisa M. Schultze, Kevin L. Pounds*, and William DeW. Horrocks, Jr. "Characterization of Lanthanide Complexes with a Series of Amide-Based Macrocycles, Potential MRI Contrast Agents, Using Eu^{3+} Luminescence and Molecular Mechanics," *Inorganic Chemistry*, **1994**, *33*, 2882-2889.

- Steven T. Frey and William DeW. Horrocks, Jr. "Complexation, Luminescence, and Energy Transfer of Ce^{3+} with a Series of Multidentate Aminophosphonic Acids in Aqueous Solution," *Inorganic Chemistry*, **1990**, *30*, 1073-1079.

Invited Lectures

- "Nano Machines and Molecular Science in the 21st Century," Jon Ramsey Honors Forum Lecture, Skidmore College, April 20, 2005

- "Hydrolysis by Metal Complexes and Metal-Bound Clay," Ithaca College, Ithaca, NY, November 14, 2000

- "The Design and Development of Molecular Scissors," Skidmore Science Symposium, October 27, 2000

- "Hydrolysis by Hydroxo-Dicopper(II) Complexes," Hamilton College, Clinton, NY, November 21, 1997

- "Hydrolysis by Hydroxo-Dicopper(II) Complexes," Miami University, Oxford, Ohio, May 29, 1997

- "Hydrolysis by Dinuclear Copper Complexes," Skidmore College, October 2, 1997

- "Copper Complexes as Tools or Models for Biochemistry," Skidmore College, January 30, 1996

Presentations at Professional Meetings (* represents undergraduate collaborators)

- "Synthesis and Characterization of a Manganese(II) Compound with the Tripodal Ligand TMPA as a Superoxide Dismutase Mimetic," Hillary A. Ramirez, Jerry P. Jasinski, Manpreet Kaur, and Steven T. Frey, Poster Presentation at the Annual Biomedical Research Conference for Minority Students, Phoenix, AZ, November 2017.

- "A Manganese (II) Complex with a Tripodal, Quinoline- Containing Ligand that Mimics the Structure and Reactivity of Superoxide Dismutase Enzymes," Juliette E. Douglass* and Steven T. Frey, Poster Presentation at the ENY ACS Undergraduate Research Conference, Siena College, Loudonville, NY, April 2017.

- "Synthesis and Characterization of a Manganese(II) Compound with the Tripodal Ligand TMPA as a Superoxide Dismutase Mimetic," Hillary A. Ramirez*, Manpreet Kauer, Jerry P. Jasinski, and Steven T. Frey, Poster Presentation at the ENY-ACS Undergraduate Research Symposium, Siena College, Loudonville, NY, April 2017.

- "Synthesis and Reactivity of a Manganese (II) Complex with a Tripodal, Quinoline-Containing Ligand that Mimics Superoxide Dismutase Enzymes," Andrew E. Loizides* and Steven T. Frey, Poster Presentation at the ENY ACS Undergraduate Research Symposium, Siena College, Loudonville, NY, April 2017.

- "Synthesis and Reactivity of Manganese (II) Complex with a Tripodal Pyridine-Containing Ligand that Mimics the Structure and Function of Superoxide Dismutase Enzymes", Yuta Nakagawa* and Steven T. Frey, Poster Presentation at the ENY ACS Undergraduate Research Conference, Siena College, Loudonville, NY, April, 2017.

- "Synthesis and Reactivity of a Family of Manganese(III) Complexes with Tetradentate Ligands that Mimic Superoxide Dismutase Enzymes", Jesse M. Evensky*; Andrew E. Loizides*; Haley A. Cirka*; and Steven T. Frey, Poster Presentation at the ENY ACS Undergraduate Research Conference, Siena College, Loudonville, NY, April, 2016.

- "Development of a Zeolite Experiment for an Upper Level Inorganic Chemistry Class", Jennifer E. Hickey* and Steven T. Frey, Poster Presentation at the ENY ACS Undergraduate Research Conference, Siena College, Loudonville, NY, April, 2016.

- "Synthesis and Reactivity of Manganese(III) Complexes with Tetradentate Ligands that Mimic Superoxide Dismutase Enzymes", Haley E. Cirka*; William Gallopp*; Prince Moses*; and Steven T. Frey, Poster Presentation at the 249th ACS National Meeting & Exposition , Denver, Colorado, March 2015.

- "Hydrolysis of *p*-Nitrophenylphosphate using Novel Ln(III) Metal-Organic Frameworks," Salvatore Fruciano*, William Amero*, and Steven T. Frey, Poster Presentation at the ENY ACS Undergraduate Research Conference, Siena College, Loudonville, NY, April, 2014.

- "Synthesis of a Photo-Switchable Ruthenium(II) Complex for "Click" Chemistry Immobilization," Jeffrey Spindel* and Steven T. Frey, Poster Presentation at the ENY ACS Undergraduate Research Conference, Siena College, Loudonville, NY, April, 2014.

- "Synthesis of a Mn(III) complexes with novel tetradentate ligands as SOD mimics," Philip Buonocore*, William A. Gallopp*, Prince B. Moses*, and Steven T. Frey, Poster Presentation at the ENY ACS Undergraduate Research Conference, Siena College, Loudonville, NY, April, 2014.

Presentations at Professional Meetings (* represents undergraduate collaborators) – continued

- "Hydrolysis of *p*-Nitrophenylphosphate Using A Eu(III)-Laponite RD Catalyst," Salvatore Fruciano* and Steven T. Frey, Poster Presentation at the ENY ACS Undergraduate Research Conference, Siena College, Loudonville, NY, April, 2013.

- "Synthesis of a Mn(III) Complex with Novel Quinoline-Containing Ligand as an SOD Mimic," William A. Gallopp* and Steven T. Frey, Poster Presentation at the ENY ACS Undergraduate Research Conference, Siena College, Loudonville, NY, April, 2013.

- "Synthesis of a Mn(III) Complex with Novel Pyridine-Containing Ligand as an SOD Mimic," Prince Moses* and Steven T. Frey, Poster Presentation at the ENY ACS Undergraduate Research Conference, Siena College, Loudonville, NY, April, 2013.

- "Synthesis of a Novel Photo-Switching Ruthenium Compound with "Click" Chemistry Capabilities," Talya A. Wolf* and Steven T. Frey, Poster Presentation at the ENY ACS Undergraduate Research Conference, Siena College, Loudonville, NY, April, 2013.

- "Immobilization of a Photoswitching Ruthenium Complex on a Gold Surface," Marissa R. Civic* and Steven T. Frey, Oral Presentation at the National Conference on Undergraduate Research, Ithaca, NY, April 2011.

- "Synthesis of a Novel, Photoswitchable Ruthenium(II) Compound," Kevin M. Sergo* and Steven T. Frey, Oral Presentation at the National Conference on Undergraduate Research, Ithaca, NY, April 2011.

- "Synthesis and Immobilization of a Novel, Photoswitchable Ruthenium(II) Complex", Steven T. Frey, Kevin M. Sergo*, and Ryan E. Faulk*, Poster presentation at the 36th Northeast Regional Meeting of the American Chemical Society, Hartford, CT, October 7-10, 2009.

- "Kinetic Characterization of *Aeromonas Proteolytica* Aminopeptidase Immobilized in Mg^{2+}/Al^{3+} Layered Double Hydroxide Clay", Alyssa Bennett*, Stephanie L. Guilmet*, Richard G. Egan III*, Steven T. Frey, and Richard C. Holz. Oral presentation at the 2006 Skidmore College Undergraduate Research Symposium in Chemistry, Saratoga Springs, NY, March 4, 2006.

- "Spectroscopic Analysis of The Photoisomerization of Compounds Related to $[Ru(tpy)(tpy)(dmso)]^{2+}$ and Immobilization of These Complexes in Laponite Clay", Kristen Massingham*, Nathaniel N. Temin*, and Steven T. Frey. Oral presentation at the 2006 Skidmore College Undergraduate Research Symposium in Chemistry, Saratoga Springs, NY, March 4, 2006.

- "Encapsulation of *Aeromonas Proteolytica* Aminopeptidase in a Layered Double Hydroxide Clay", Steven T. Frey, Stephanie L. Guilmet*, and Richard C. Holz. Poster presentation at the 78th ACS Colloid and Surface Science Symposium, Yale University, New Haven, CT, June 20-23, 2004.

- "Hydrolysis of Phosphate Esters by Lanthanide(III) Ion-Bound Hectorite Immobilized on Nylon Fibers", Brian J. Anderson*, Patrick M. Hutchins*, and Steven T. Frey. Poster presentation at the 31st Northeast Regional Meeting of the American Chemical Society, Saratoga Springs, NY, June 15-18, 2003.

- "Phosphate Ester Hydrolysis by Lanthanide(III) Ion-Exchanged Hectorite Clay", Steven T. Frey, Brian J. Anderson*, Gregory L. Wrubel*, Patrick M. Hutchins*, Cynthia M. Aborn*, and Michael E. Hagerman. Oral presentation at the 31st Northeast Regional Meeting of the American Chemical Society, Saratoga Springs, NY, June 15-18, 2003.

Presentations at Professional Meetings (* represents undergraduate collaborators) – continued

- "Catalytic Hydrolysis of 4-Nitrophenyl Phosphate by Lanthanum(III) Ion-Exchanged Hectorite Clay", Brian J. Anderson*, Benjamin M. Hutchins*, Teresa K. Schreiber*, and Steven Frey. Oral presentation at the 17th National Conference on Undergraduate Research at the University of Utah, March 13-15, 2003.

- "Catalytic Hydrolysis of Phosphate Esters by Lanthanum(III)-Hectorite," Steven T. Frey, Benjamin M. Hutchins*, Dana M. Hach*, Michelle W. Frey, and Michael E. Hagerman. The 30th American Chemical Society Northeast Regional Meeting, University of New Hampshire, Durham, NH, June 26, 2001

- "Hydrolysis by Metal-Bound Clays," Benjamin M. Hutchins* and Steven T. Frey. National Conference on Undergraduate Research, University of Kentucky, Lexington, KY, March 16, 2001

- "Hydrolysis by Metal-Bound Hectorite," Benjamin M. Hutchins* and Steven T. Frey. 2nd Annual Robert A. Laudise Symposium for Undergraduate Research in Chemistry, poster session, Union College, September 16, 2000.

- "Hydrolysis by Metal-Bound Hectorite," Benjamin M. Hutchins* and Steven T. Frey. Chemistry Undergraduate Research Symposium of the Eastern New York Section of the American Chemical Society, Rensselaer Polytechnic Institute, April 15, 2000

- "Confirmation of the Hydrolytic Activity of a Cu(II) Trinuclear Metal Complex," Martin Moehlen* and Steven T. Frey. Chemistry Undergraduate Research Symposium of the Eastern New York Section of the American Chemical Society, Rensselaer Polytechnic Institute, April 15, 2000

- "Targeting Functional Models of Metallo-Hydrolase Enzymes," Michelle D. Ritorto* and Steven T. Frey. National Conference on Undergraduate Research, poster session, University of Rochester, Rochester, NY, April 8-10, 1999

- "ES 101 – Field Studies in Environmental Science: A Liberal Arts Interdisciplinary College Course that Focuses on a Local Watershed," Kirk, K. B., Halstead, J. A., Thomas, J. J., and Frey, S. T. Geological Society of America Meeting, Toronto, Canada, October 1998

- "Investigation of the Reactivity of a Dicopper(II) Hydrolase Model with Phenylacetate Derivatives," Michelle D. Ritorto* and Steven T. Frey. Chemistry Undergraduate Research Symposium of the Eastern New York Section of the American Chemical Society, Skidmore College, April 18, 1998

- "Synthetic Modeling of Manganese-Containing Superoxide Dismutase," Eric N. Tsapovski* and Steven T. Frey. Northeast Regional Meeting of the American Chemical Society, Poster Session, Saratoga Springs, NY, June 1997

- "Skidmore College ACS Student Affiliate Chapter Activities for 1996-1997," Ethan A. Kohn*, Jessica C. Edwards*, Eric N. Tsapovski*, Steven T. Frey, and Judith A. Halstead. Northeast Regional Meeting of the American Chemical Society, Poster Session, Saratoga Springs, NY, June 1997

- "Examination of the Aqueous Chemistry of a Dicopper(II) Hydrolase Model," Matthew E. Lebow* and Steven T. Frey. Chemistry Undergraduate Research Symposium of the Eastern New York Section of the American Chemical Society, Russell Sage College, April 19, 1997

- Steven T. Frey, N. Narasimha Murthy, Xin Zhang, Kenneth D. Karlin, and Susan T. Weintraub. "Hydrolysis of Unactivated Esters, and Hydration of Acetonitrile by a Novel Dinuclear Copper(II) Complex," ACS National Meeting, Poster Session, Orlando, Fl, August, 1996

Presentations at Professional Meetings (* represents undergraduate collaborators) – continued

- Kristi J. Humphreys, Steven T. Frey, N. Narasimha Murthy, Helen J. Sun, and Kenneth D. Karlin. "DNA Cleavage by Multinuclear Copper(II) Complexes," ACS National Meeting, Poster Session, Orlando, Fl., August 1996

- William DeW. Horrocks, Jr., Shu Ling Wu, Sarah E. Burroughs, Steven T. Frey, and Yueli Wang. "Characterization of Europium(III) Complexes Using Laser Spectroscopy: From Icosahedral Viruses to Imaging Agents," Rare Earth Research Conference, Monterey, CA., September 1993

- William DeW. Horrocks, Jr., Sarah E. Burroughs, Steven T. Frey, and Richard C. Holz. "Europium(III) and Cerium(III) Luminescence as a Probe of Biomolecules and Coordination Compounds: Icosahedral Viruses and Aminophosphonate Complexes," Rare Earth Research Conference, Leuven, Belgium, September 1990

- Steven T. Frey and William DeW. Horrocks, Jr. "Characterization of Lanthanide(III) Complexes with Tetraaza Macrocyclic Tetra(methylphosphonic acid) Ligands by Luminescence Spectroscopy," Fourth International Conference on Bioinorganic Chemistry, Poster Session, Boston, MA., July 1989

- Barbara C. Thompson, Steven T. Frey, Joel M. Tingey, and William DeW. Horrocks, Jr. "An Investigation of the Interaction of Calmodulin with Target Enzyme Analogs Using Luminescence Spectroscopy," ACS National Meeting, Poster Session, Toronto, Canada, June 1988.

Grants

External

- Research Corporation Cottrell College Science Award, $44,990 two-year grant starting on June 30, 2006.
- NSF-MRI Grant (contributing author, PI's were David Domozych and Richard Lindeman of Skidmore), $233,790 for the acquisition of a scanning electron microscope and energy dispersive X-ray analysis system, funded January 2004.
- NSF-MRI Grant (contributing author, PI was Janet Morrow of SUNY Buffalo), $165,370 for the purchase of a laser system for direct excitation of lanthanide(III) luminescence, funded spring 2003.
- Petroleum Research Fund Type B, $49,770 three-year grant starting on January 1, 2002.

Internal

- Summer Technological Innovation Grant, $1,850, Summer 2005.
- Rathmann Curriculum Development Grant, $1,200, Summer 2003.
- Skidmore Faculty Development Grant, $1,000 (January 1, 2001 to August 31, 2001)
- Skidmore Summer Collaborative Research Grants, total of $19,300 (Summer 1997, 1998, and 2000)
- International Affairs/Environmental Studies Curriculum Development Grant, $2,700 (1999)

Honors/Awards

- Inaugural Jon Ramsey Honors Forum Lecturer, April 2005.
- Featured in the December 14, 2001 issue of the *Skidmore Intercom*
- Elected as a Project Kaleidoscope Faculty for the 21st Century representative, 1997
- American Institute of Chemists Award for "Outstanding Senior Student Majoring in Chemistry," Ithaca College, 1987
- ACS Student Award in Analytical Chemistry, Ithaca College, 1986
- Petroleum Research Foundation Summer Research Fellowship, 1986