

HANS-CONRAD ZUR LOYE

David W. Robinson Palmetto Professor of Chemistry and Carolina Distinguished Professor
Department of Chemistry and Biochemistry
University of South Carolina

EDUCATION

Postdoc	1988-89	Northwestern University	Chemistry
Ph.D.	1988	University of California, Berkeley	Chemistry
Sc. B.	1983	Brown University	Chemistry

EMPLOYMENT HISTORY

Expert Consultant to NSF	National Science Foundation	2024-present
Joint Appointment	Savannah River National Laboratory in Radiochemistry and Materials Science	2020-present
Carolina Distinguished Professor	University of South Carolina	2018-present
Associate Dean for Research and Graduate Education	College of Arts and Sciences University of South Carolina	2015-2020
Associate Dean for Research	College of Arts and Sciences University of South Carolina	2011-2015
Interim Associate Dean for Research	College of Arts and Sciences University of South Carolina	2011
David W. Robinson Palmetto Professor of Chemistry	Department of Chemistry and Biochemistry University of South Carolina	2000-present
Professor	Department of Chemistry and Biochemistry University of South Carolina	2000-present
Associate Professor	Department of Chemistry and Biochemistry University of South Carolina	1996-2000
Associate Professor	Department of Chemistry Massachusetts Institute of Technology	1994-1996
Assistant Professor	Department of Chemistry Massachusetts Institute of Technology	1989-1994
Postdoctoral Fellow	Department of Chemistry Northwestern University	1988-1989

CURRENT RESEARCH INTERESTS

Synthesis of new hierarchical wasteform materials for the effective immobilization of nuclear waste in persistent architectures

Crystal growth of new oxide materials

Crystal growth of new fluorides

Crystal growth of new chalcogenides

Synthesis of new, structurally complex, scintillator materials

Investigation of optical, electronic and magnetic properties of new materials

Cooperative structure-property relationships

We investigate the crystal growth of new materials, including new scintillating and luminescing oxides and fluorides, and new uranium and thorium containing structures. In the latter case, we synthesize new hierarchical wasteform materials for the effective immobilization of nuclear waste in persistent architectures.

SUMMARY OF SCIENTIFIC ACCOMPLISHMENTS

Funding:	Over \$30 Million in research funding to date
Publications:	Over 500 publications in peer reviewed journals to date.
Patents:	7
Citations:	Over 20,000 citations; h-index = 73.
Undergraduates:	Over 50 undergraduate researchers trained to date.
Graduate Students:	Over 40 graduate student researchers trained to date.
Postdocs:	Over 15 postdoctoral researchers trained to date.
Research Seminars	> 200

I. HONORS AND AWARDS

Florida Award, ACS Florida Section, **2025**.

Furman University John Albert Southern Lecturer, **2019**.

Carolina Distinguished Professor, **2018-present**.

Breakthrough Leadership in Research Award, **2016-2017**.

Charles H. Stone Award, ACS Carolina Piedmont Section, **2016**.

South Carolina Governor's Award for Excellence in Scientific Research, **2016**.

University of South Carolina Trustee Professorship Award, **2012**.

Southern Chemist Award, ACS Memphis Section, **2011**.

Elected to the rank of Fellow of the American Chemical Society, **2011**.

Guest Researcher at NIMS, Tsukuba, Japan, **2010**.

Outstanding South Carolina Chemist, ACS South Carolina Section, **2010**.

Elected to the rank of Fellow of the AAAS, **2009**.

IPMI Henry J. Albert Award, **2009**.

Invited Professor, Universite d'Angers, France, **2008**.

University of South Carolina Educational Foundation Award for Research in Science, Mathematics and Engineering, **2006**.

Elected full member of Sigma Xi, **2006**.

Visiting Professor Sun Yat-sen University, **2004-2006, 2008-2011**.

Visiting Professor at the ICMCB-CNRS-Bordeaux, France, **2003**.

Guest Professor Shandong Normal University, **2001**.

David W. Robinson Palmetto Professorship, **2000-present**.

Visiting Professor at the Université de Picardie, Jules Verne, France, **1999**.

Exxon Award in Solid State Chemistry, **1994**.

Paul M. Cook Career Development Professorship, **1993**.

Camille & Henry Dreyfus New Faculty Award, **1989**.

Raychem Fellowship, **1987**.

Earle C. Anthony Fellowship, **1984-1985**.

Chemistry Fellowship, UC Berkeley, **1983-1984**.

Graduated Magna Cum Laude with Honors, Brown University, **1983**.

Elected to Sigma Xi, **1981**.

II. PROFESSIONAL ACTIVITIES

Candidate for Executive Committee of the ACS Division of Fluorine Chemistry, **2021**.

UofSC SRNL Steering Committee, **2021-present**.

Inaugural Member American Association to Advance Powder Diffraction, **2020-present**.

Editorial Board Member – Inorganics, **2020-present**.

Director, DOE-EFRC “Center for Hierarchical Waste Form Materials” Renewed: **2020-2024**.

Member CAS Return to Work Planning and Management Team – UofSC, **2020**.

Member Future Planning Group – Research Subcommittee – UofSC, **2020**.

Member Battelle-SRNL-UofSC Team: SRNL Planning Committee, **2020**.

External Reviewer for the Notre Dame Center for Sustainable Energy, **2020**.

Chair, SSMC/EPM subcommittee of the NSF-DMR Committee of Visitors (COV). (SSMC = Solid State and Materials Chemistry; EPM = Electronic and Photonic Materials), **2019**.

Guest Editor – Frontiers in Chemistry – Special issue on Flux Crystal Growth, **2019**.

Institutional Director, NSF EPSCoR Track-1, **2017-2024**.

Member International Advisory Board *Materials Issues in Nuclear Waste Treatment and Disposal*, CIMTEC, **2017-2018**.

Member External Review Committee of Savannah River National Laboratory (SRNL), **2017**.

External Reviewer of the FSU Chemistry Department, **2017**.

Director, DOE-EFRC “Center for Hierarchical Waste Form Materials” **2016-2020**.

Member Assistant/Associate Dean’s Graduate Council, **2016-present**.

Member External Review Committee of Savannah River National Laboratory (SRNL), **2016**.

Editorial Board Member - Solid State Sciences, **2016-present**.

Member International Advisory Board of the MAPEX Center for Materials and Processes, University of Bremen, Germany, **2015 – present**.

Technical Sessions Chair, 2016 South East Regional Meeting of the American Chemical Society (SERMACS), **2015-2016**.

Chair, Solid State Chemistry Gordon Conference, **2014-2016**.

Vice Chair, Solid State Chemistry Gordon Conference, **2012-2014**.

Breakthrough Magazine – Editorial Advisory Board, **2011-2013**.

Participant, NSF Materials Genome Initiative Workshop, Dec. 13, **2012**.

Oak Ridge National Laboratory (ORNL) SNS/HFIR User Group Executive Committee, **2011-2014**.

Associate Editor, Journal of Alloys and Compounds, **2011-2014**.

ORNL Neutron Scattering Science Review Committee, **2010-present**.

Director, Powder X-ray Diffraction Facility, **2008-present**.

Editor, Journal of the South Carolina Academy of Science, **2008-2012**.

Faculty Fellow, Office of Research and Health Sciences, USC, **2007-2008**.

Leader of the Polymer Nanocomposites Group at USC, **2006-2008**.

President South Carolina Academy of Science, **2006-2007**.

President-elect South Carolina Academy of Science, **2005**.

Vice-President South Carolina Academy of Science, **2004**.

Member Users Executive Committee, Brookhaven National Laboratory (BNL), Center for Functional Nanomaterials, **2004-2006**.

Sabbatical at Brookhaven National Laboratory, BNL-National Synchrotron Light Source, **2003**.

Chair: Solid State Chemistry Subdivision, American Chemical Society (ACS), Division of Inorganic Chemistry, **2003-2004**.

Editorial Board Member – Journal of the South Carolina Academy of Science, **2002-2008**.

Co-organizer of the NSF Summer Program in Solid State Chemistry, **2001-2007**.

Councilor to the South Carolina Academy of Science, **2000-2004**.

Editorial Board Member - Journal of Alloys and Compounds, **1998-2011**.

Associate Editor for Journal of Solid State Chemistry, **1997-2022**.

Editorial Board Member - Solid State Ionics, **1997-2002**.

Section Editor for CHEMTRACTS -Inorganic Chemistry, **1997-2007**.

III. SCHOLARSHIP

A. Thesis

“Magnetic, Chemisorption and Infrared Studies of Ni/TiO₂: An Example of an Epifacial Reaction”

Ph.D. thesis completed May 1988.

Supervisor: Prof. Angy Stacy

Institution: UC Berkeley

B. Publications

Submitted

Panigrahi, G., Kashem, H. B., Morrison, G., zur Loye, H.-C., “Synthesis of a Series of Rare-Earth-based Multi Anion Chalcogenide Iodides: RE₃Si₂Se_xS_{8-x}I (RE = La, Ce, Pr, and Nd) Flux-Assisted Boron Chalcogen Mixture Method Crystal Growth and Characterization of Magnetic, Optical, and Photoluminescent Properties”, Dalton Trans., Special Issue on Mixed Anion Compounds, **2024**, submitted.

Dixon, C. M., Aziziha, M., Mofrad, A., Soldan Palma, J. P., Booth, R. E., Manissery, A. P., Wilson, J. A., zur Loye, H.-C., Tisdale, H. B., Schorne-Pinto, J., Besmann, T. M., “Thermodynamic Assessment of Cesium and Iodine in LiF-NaF-KF (FLiNaK) for MSR Accident Analysis”, The Journal of Chemical Thermodynamics, **2025**, submitted.

Deason, T. K., Tisdale, H. B., Hines, A. T., Morrison, G., Zhoujin, Y., Smith, M. D., Besmann, T. M., Mofrad, A. M., Estes, S. L., Amoroso, J. W., DiPrete, D. P., zur Loye, H.-C., “Absence of Americium (Am) Covalency in Extended Structures: Investigation of Americium Containing Phosphates, Silicates, Borates, Molybdates and Fluorides Synthesized via High Temperature Flux Crystal Growth”, J. Am. Chem. Soc., **2024**, submitted.

Bretana, A., Housley, C., Ajo, H., Koenig, T., Li, W., Conner, B. S., Ward, P. A., Greer, R., Morrison, G., zur Loye, H.-C., Rai, B. K., “Magnetic properties of Lutetium and Yttrium doped Ce₂Fe₁₄B magnets”, J. Alloys Comp., **2024**, submitted.

Foster, K. R., Schorne-Pinto, J., Aziziha, Mina, Tisdale, H. B., Fitzpatrick, B. W. N., zur Loye, H.-C., Piro, M. H. A., Besmann, T. M., “Purification of Uranium Tetrafluoride Using Ammonium Bifluoride”, J. Fluorine Chem., **2024**, submitted.

In Print

1. Keerthisinghe, N., Morrison, G., Breton, L. S., Smith, M. D., Zhang, Q., Kirkham, M. J., Klepov, V. V., zur Loye, H.-C., “From Magnetic Chains to Sheets: The Impact of Hydrofluoric Acid Quantities in Mild Hydrothermal Synthesis on Mixed-Metal Fluoride Formation”, DOI:10.1021/acs.chemmater.4c03524. *Chem. Mater.*, **2025**, in print.
2. Zhoujin, Y., Tisdale, Y., Keerthisinghe, N., Morrison, G., Smith, M. D., Besmann, T. M., Amoroso, J. W., zur Loye, H.-C., “A Low Temperature, One-Step Synthesis for Monazite Can Transform Monazite into a Readily Usable Advanced Nuclear Waste Form”, *Science Adv.*, **2025**, accepted.
3. Deason, T. K., Grasser, M. A., Mofrad, A. M., Amoroso, J., DiPrete, D. P., Morrison, G., Tisdale, H. B., Pellechia, P. J., Estes, S. L., Smith, M. D., Besmann, T. M., zur Loye, H.-C., “Ionothermal Synthesis of $\text{Am}_4\text{B}_{22}\text{O}_{42}\text{Cl}_{12}$: A Chiral Cubic Americium Borate Cluster”, DOI:10.1021/acs.inorgchem.4c05455. *Inorg. Chem.*, **2025**, *64*, 2182-2187.
4. Sturgill, C. J., Milisavljevic, I., Wechsler, S., Muhit, M. A. A., zur Loye, H.-C., Misture, S. T., Stefik, M., “Tailored TiNb_2O_7 Particle Size, Defects, and Crystallinity Accelerate Lithiation”, DOI:10.1021/acs.chemmater.4c02279. *Chem. Mater.*, **2025**, *37*, 624-635
5. Tisdale, H. B., zur Loye, H.-C., “Molten Salt Flux Synthesis of Two New Alkali Rare Earth Silicate Fluorides: $\text{Rb}_3\text{Sc}_2[\text{Si}_4\text{O}_{12}]\text{F}$ and $\text{Rb}_2\text{Sm}[\text{Si}_4\text{O}_{10}]\text{F}$ ”, DOI:10.1016/j.solidstatesciences.2024.107802. *Solid State Sci.*, **2025**, *160*, 107802.
6. Panigrahi, G., Tisdale, H. B., Morrison, G., zur Loye, H.-C., “ $\text{Na}_2\text{B}_{12}\text{Si}_6\text{Se}_{18}$: A Novel B_{12} -Cluster-containing Quaternary Selenoborate Framework Material”, DOI:10.1039/D4DT03139C. *Dalton*, **2025**, *54*, 1956-1963.
7. zur Loye, H.-C., Vecernik, P., Kiselova, M., Kaspar, V., Korenkova, H., Miller, V., Bezdicka, P., Subrt, J., Murafa, N., Shkuropatenko, V., Saienko, S., “Investigation of Magnesium-Potassium Phosphates as Potential Nuclear Waste Form for the Immobilization of Minor Actinides”, DOI:10.3390/inorganics12120311. *Inorganics*, **2024**, *12*, 311.
8. Panigrahi, G., Morrison, G., Smith, M. D., zur Loye, H.-C., “Synthesis, Optical, and Magnetic Properties of the Mixed Chalcogenide Semiconductor Series $\text{Eu}(\text{II})_2\text{SiSe}_x\text{S}_{4-x}$, Prepared via the Flux-Assisted Boron Chalcogen Mixture Method”, DOI:10.1021/acs.inorgchem.4c03987. *Inorg. Chem.*, **2024**, *63*, 23802-23809.

9. Mao, Z., Li, Y., Montgomery, R., Grandjean, A., zur Loye, H.-C., Hu, S., “A Finite Difference Informed Random Walker (FDiRW) Solver for Strongly Inhomogeneous Diffusion Problems”, DOI:10.1016/j.commat.2024.113474. *Comp. Mater. Sci.*, **2024**, *246*, 113474.
10. Muhit, M. A. A., Wechsler, S. C., Bare, Z. J. L., Sturgill, C. J., Keerthisinghe, N., Grasser, M. A., Morrison, G., Sutton, C., Stefik, M., zur Loye, H.-C., “Comparison of Lithium Diffusion in Isostructural Ta₁₂MoO₃₃ and Nb₁₂MoO₃₃: Experimental and Computational Insights from Single Crystals”, DOI:10.1021/acs.chemmater.4c02118. *Chem. Mater.*, **2024**, *36*, 10626-10639.
11. Deason, T. K., Morrison, G., Mofrad, A., Amoroso, J., DiPrete, D., Besmann, T. M., Estes, S. L., zur Loye, H.-C., “Molten Flux Synthesis of Plutonium (IV) Silicates K₂PuSi₂O₇ and Rb₂PuSi₆O₁₅”, DOI:10.1002/ejic.202400482. *Eur. J. Inorg. Chem.*, **2024**, *27*, e202400482.
12. Proust, V., Leybros, A., Gossard, A., David, T., Mao, Z., Li, Y., Hu, S., Grandjean, A., zur Loye, H.-C., “Influence of porous aluminosilicate grain size materials in experimental and modelling Cs⁺ adsorption kinetics and wastewater column process”, DOI: 10.1016/j.jwpe.2024.106066. *J. Water Process. Eng.*, **2024**, *66*, 106066.
13. Masachchi, L. W., Keerthisinghe, N., Berseneva, A. A., Morrison, G., Smith, M. D., Breton, L. S., Schorne-Pinto, J., Aziziha, M., zur Loye, H.-C., “Sensitivity of Mild Hydrothermal Synthesis to the Reaction Conditions: Targeting Mixed-Metal Hexagonal Tungsten Bronze Fluorides $A_xM^{2+}_xM^{3+}_{(1-x)}F_3$ to Investigate their Magnetic Behavior”, DOI:10.1021/acs.inorgchem.4c02307. *Inorg. Chem.*, **2024**, *63*, 17598-17607.
14. Morrison, G., Hines, A. T., Jones, V. G., Zamorano, K. P., Adams, E. N., Smith, M. D., zur Loye, H.-C., “Flux Synthesis of Alkaline-Earth Lanthanide Borates as Potential Nuclear Waste Forms”, DOI:10.1021/acs.inorgchem.4c02297. *Inorg. Chem.*, **2024**, *63*, 15359-15367.
15. Keerthisinghe, N., Morrison, G., zur Loye, H.-C., “Crystal Growth and Characterization of the Rare Earth Fluoride Carbonates NaLnCO₃F₂ (Ln = Eu-Lu)”, DOI:10.1021/acs.cgd.4c00862. *Cryst. Growth Design*, **2024**, *24*, 6845–6850.
16. Meurer, F., Morrison, G., Hischa, B., zur Loye, H.-C., Hennig, C., Bodensteiner, M., “Improvement of Single-Crystal Structures of Very Heavy Element Compounds by Refining Anomalous Dispersion Parameters”, DOI:10.1021/acs.inorgchem.4c01772. *Inorg. Chem.*, **2024**, *63*, 15784-15790.

17. Berseneva, A. A., Klepov, V. V., Kashem, H. B., Maksimova, A. A., Morrison, G., Wright, J., Schaeperkoetter, J., Misture, S. T., zur Loye, H.-C., “A Rare Bird: U⁺⁵ in Uranium Chalcogenides”, DOI:10.1021/acs.chemmater.4c01440. *Chem. Mater.*, **2024**, *36*, 7988-8001.
18. Mofrad, A., Christian, M. S., Schorne-Pinto, J., Amoroso, J., Brinkman, K. S., zur Loye, H.-C., Besmann, T. M., “Predictive Phase Stability of Actinide-Bearing Hollandite Waste Forms from First-Principles Calculations”, DOI:10.1016/j.jnucmat.2024.155291. *J. Nucl. Mater.*, **2024**, *600*, 155291.
19. Wang, X., Ta, A., Stéphen, Q., Grandjean, A., zur Loye, H.-C., Phillpot, S., “Incorporation of Alkali Ions into Hydrated Copper Hexacyanoferrate by Density Functional Theory Calculations”, DOI: 10.1021/acs.chemmater.4c00282. *Chem. Mater.*, **2024**, *36*, 6731-6739.
20. Tisdale, H. B., Conner, R. L., Jacobsohn, L. G., zur Loye, H.-C., “Alkali Rare Earth Double Phosphates: Promising New High Temperature Scintillators”, DOI:10.1016/j.solidstatesciences.2024.107612. *Solid State Sci.*, **2024**, *154*, 107612.
21. Panigrahi, G., Berseneva, A. A., Morrison, G., King, A. A., Conner, R. L., Jacobsohn, L. G., zur Loye, H.-C., “Crystal Growth of Quaternary AkRE₂Si₂S₈ (Ak = Ca, Sr; RE = La-Tb) Thiosilicates Using Flux Assisted Boron Chalcogen Mixture Method: Exploring X-ray Scintillation, Luminescence, and Magnetic Properties”, DOI:10.1021/acs.inorgchem.4c01314. *Inorg. Chem.*, **2024**, *63*, 12849-12857.
22. Ta, A. T., Daouli, A., Ullberg, R. S., Fonseca, E., Proust, V., Grandjean, A., Henning, R. G., zur Loye, H.-C., Badawi, M., Phillpot, S. R., Incorporating Solvent Effects in DFT: Insights from Cation Exchange in Faujasites”, DOI:10.1039/d4cp00467a. *J. Phys. Chem. Chem. Phys.*, **2024**, *26*, 14561-14572.
23. Mao, Z., Zhang, X., Li, Y., Proust, V., Gossard A., David, T., Montgomery, R., Grandjean, A., Yu, H., zur Loye, H.-C., Hu, S., “Phase field-volumetric lattice Boltzmann model of ion uptake in porous nuclear waste form materials under continuous flow”, DOI:10.1016/j.jnucmat.2024.155103. *J. Nucl. Mater.*, **2024**, *596*, 155103.
24. Zhang, X., Mao, Z., Hilty, F. W., Li, Y., Grandjean, A., Montgomery, R., zur Loye, H.-C., Yu, H., Hu, S., “Volumetric lattice Boltzmann method for pore-scale diffusion-advection in geopolymer porous structures for nuclear waste treatment”, DOI:10.1016/j.jrmge.2024.03.006. *J. Rock Mech. Geotech. Eng.*, **2024**, *16*, 2126-2136.

25. Birkner N., Proust, V., Schaeperkeotter, J., Ta, A. T., Gossard, A., Badawi, M., Daouli, A., Mixture, S., Phillpot, S. R., zur Loye, H.-C., Brinkman, K. S., Grandjean, A., ‘Microstructure, Adsorption Site Energetics, and Formation Enthalpy Control for FAU- Zeolite Cs⁺ Exchange’, DOI:10.1016/j.micromeso.2024.113110. *Microp. Mesop. Mater.*, **2024**, 373, 113110.
26. Schorne-Pinto, J., Aziziha, M., Tisdale, H., Mofrad, A., Birri, A., Christian, M., Ard, J., Booth, R., Yingling, J., Palma, J., Dixon, C., zur Loye, H.-C., Besmann, T. M., ‘Thermal Property Modeling and Assessment of the Physical Properties of FLiNaK’, DOI:10.1021/acsaem.4c00321. *ACS Applied Energy Materials*, **2024**, 7, 4016-4029.
27. Rai, B. K., Bretana, A., Morrison, G., Greer, R., Gofryk, K., zur Loye, H.-C., ‘Crystal Structure and Magnetism of Actinide Oxides: A Review’, DOI:10.1088/1361-6633/ad38cb. *Rep. Prog. Phys.*, **2024**, 87, 066501.
28. Tisdale, H. B., Mofrad, A. M., Morrison, M., Besmann, T. M., zur Loye, H.-C., ‘Rb₂Ln[Si₂O₆]F (Ln = Y, Eu-Lu): Flux Synthesis, Structure Determination, and DFT-Calculated Formation Enthalpies of a Series of Mixed-Anion Rare Earth Cyclosilicates’, DOI:10.1021/acs.inorgchem.3c02530. *Inorg. Chem.*, **2023**, 62, 18440-18448.
29. King, A. A., Breton, L. S., Morrison, M., Smith, M. D., zur Loye, H.-C., ‘Boron Chalcogen Mixture (BCM) Method Assisted Alkali Halide Flux Crystal Growth of an Extensive Family of Quaternary Rare Earth Transition Metal Thiosilicates: Investigation of their Structures and Magnetic Properties’, DOI:10.1021/acs.inorgchem.3c02639. *Inorg. Chem.*, **2023**, 62, 18172-18178.
30. Breton, L. S., Morrison, G., zur Loye, H.-C., ‘Synthesis, Characterization, and Magnetic Properties of Uranium Containing 2H-Perovskite Related Sulfides: Ba₃MUS₆ (M = Mn, Fe, Co, Ni) and Ba₃Co_{0.858(5)}Mg_{0.142(5)}US₆’, DOI:10.1021/acs.inorgchem.3c0274. *Inorg. Chem.*, **2023**, 62, 17409-17416.
31. Masachchi, L. W., Keerthisinghe, N., Morrison, G., Berseneva, A. A., Smith, M. D., zur Loye, H.-C., ‘Crystal Growth and Magnetism of Transition Metal Pyrochlore Fluorides’, DOI:10.1021/acs.inorgchem.3c01491. *Inorg. Chem.*, **2023**, 62, 13793-13801.
32. Park, K. C., Kittikhunnatham, P., Lim, J., Thaggard, G. C., Liu, Y., Martin, C. R., Leith, G. A., Ta, A. T., Birkner, N., Lehman-Adino, I., Hernandez-Jimenez, A., Morrison, G., Amoroso, J., zur Loye, H.-C., DiPrete, D. P., Smith, M. D., Brinkman, K. S., Phillpot, S. R., Shustova, N. B., ‘The Highly Operational Team (HOT) toward f-Block Materials’, DOI:10.1002/anie.202307093. *Angew. Chem. Int. Ed. Engl.* **2023**, 62, e202216349

33. Fu, N., Hu, J., Feng, Y., Morrison, G., zur Loye, H.-C., Hu, J., “Composition based oxidation state prediction of materials using deep learning language models”, DOI:10.1002/advs.202301011. *Adv. Sci.*, **2023**, 2301011.
34. Keerthisinghe, N., Ayer, G. B., Smith, M. D., zur Loye, H.-C., “Mild Hydrothermal Crystal Growth of a Series of Ternary Hafnium Fluorides”, DOI:10.1021/acs.inorgchem.3c01623. *Inorg. Chem.*, **2023**, 62, 12089-12098.
35. Morrison, G., Jones, V. G., Zamorano, K. P., Greedan, J. E., zur Loye, H.-C., “Flux Synthesis, UV-vis Absorbance, and Magnetism of Cesium Copper Silicates with an Isolated Super-super Exchange Spin Dimer in $\text{Cs}_6\text{Cu}_2\text{Si}_9\text{O}_{23}$ ”, DOI:10.1021/acs.inorgchem.3c01549. *Inorg. Chem.*, **2023**, 62, 11682-11689.
36. Berseneva, A. A., zur Loye, H.-C., “Advances in Chalcogenide Crystal Growth: Flux and Solution Syntheses, and Approaches for Post-Synthetic Modifications”, DOI:10.1021/acs.cgd.3c00573. *Cryst. Growth Design*, **2023**, 23, 5368-5383.
37. Morrison, G., Masachchi, L. W., Tisdale, H. B., Chang, T., Jones, V. G., Zamorano, K. P., Breton, L. S., Chen, Y.-S., zur Loye, H.-C., “Polymorphism in A_3MF_6 (A = Rb, Cs; M = Al, Ga) Grown using Mixed Halide Fluxes”, DOI:10.1039/d3dt00352c. *Dalton*, **2023**, 52, 8425-8433.
38. Breton, L. S., Smith, M. D., zur Loye, H.-C., “Synthesis of Uranium Mixed Anion Compounds Synthesized using the Boron-Chalcogen Mixture Method: $\text{Ba}_6\text{Co}_6\text{U}_{0.91}\text{S}_{13.5}\text{O}_{0.5}$ and $\text{Ba}_{5.47}\text{K}_{0.53}\text{Zn}_6\text{US}_{13.5}\text{O}_{0.5}$ ”, DOI:10.1016/j.solidstatesciences.2023.107207. *Solid State Sci.*, **2023**, 140, 107207.
39. King, A. A., Breton, L. S., Morrison, G., Smith, M. D., Liang, M., Halasyamani, P. S., zur Loye, H.-C., “Crystal Structures and Property Measurements of Novel Rare Earth Magnesium Thiosilicates Synthesized via Flux Crystal Growth Utilizing the Boron Chalcogenide Mixture Method”, DOI:10.1021/acs.inorgchem.3c00708. *Inorg. Chem.*, **2023**, 62, 7446-7452.
40. Deason, T. K., Hines, A. T., Morrison, G., Smith, M. D., Besmann, T. M., Mofrad, A. M., Fondeur, F. F., Lehman-Andino, I., Amoroso, J. W., DiPrete, D. P., zur Loye, H.-C., “Flux Crystal Growth of the Extended Structure Pu(V) Borate $\text{Na}_2(\text{PuO}_2)(\text{BO}_3)$ ”, DOI:10.1021/jacs.2c11355. *J. Am. Chem. Soc.*, **2023**, 145, 10007-10014.
41. Usman, M., Christian, M., Smith, M. D., Besmann, T., zur Loye, H.-C., “DFT-Guided Flux Synthesis of a Family of Layered Titanates Crystallizing in the Lepidocrocite Structure Type”, DOI: 10.1016/j.solidstatesciences.2023.107161. *Solid State Sci.*, **2023**, 139, 107161.
42. Berseneva, A. A., Klepov, V. V., Tisdale, H. B., zur Loye, H.-C., “Flux-assisted polytypism in the $[\text{Na}_2\text{Cl}]\text{GaQ}_2$ heterolayered salt-inclusion chalcogenide family”,

DOI:10.1039/D3CE00074E. CrystEngComm, **2023**, 25, 2307-2312.

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C. Patents and Invention Disclosures

1. Cermet Waste Form for the Immobilization of Nuclear Waste

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PCT Patent Appl. No.: PCT/US24/49067

Filed: September 27, 2024

Title: CERMET WASTE FORMS FOR DISPOSAL OF WASTE FROM
ADVANCED REACTORS

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Rutgers Ref.: P2024-032

USC Ref: 1681

Michael Best (Law Firm) File No.: 210953-0017-US01

2. Polar Oxysulfide for Nonlinear Optical Applications
HC zur Loye, Y Tsujimoto - US Patent App. 16/561,190, 2020
Single crystals of a new noncentrosymmetric polar oxysulfide SrZn₂S₂O (sg Pmn2)
Patent Issued August 11, 2020, **US Patent Number: 10,737,948 B2**
US Patent 11,975,987

3. Latshaw, A., Morrison, G. zur Loye, H.-C. "New Tetragen Scintillators" USCRF No 868. Issued 8/11/2020, US Patent number: 10,738,239

Date	App/Pub Number	Status
2017-11-14	US15811939	Pending
2018-05-17	US20180134957A1	Application

4. Chance, W. M., zur Loye, H.-C., U.S. Patent Application Entitled: "synthesis and crystal structure of iron zeolitic frameworks",

U.S. Appl. No: 15/218,742; Filed: **July 25, 2016**; Ref: USC-421.
Patent Issued February 19, 2019, **US Patent Number: 10,207,934 B2**.

5. zur Loye, H.-C., Hansen, T., "Polymer Composite Materials and Methods For Producing Same", **U.S. Patent # 7,951,860**, Issued May 31, **2011**.

6. Barber, III; Arthur Peter, Ploehn; Harry J., zur Loye; Hans-Conrad
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Filing date: June 22, **2006**; Priority US/24.06.05/ USA 165720. Issued October 21, **2008**, **U.S. Patent # 7,438,889**. Patent for SCRF#359: Use of Metal Oxides in the

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2. zur Loye, H.-C., "Crystal Growth of New Uranium and Transuranic Phases via High Temperature Solution and Mild Hydrothermal Methods: Exploration of New Materials as Potential Nuclear Waste Forms", Atalante 2024, Avignon, France, Sept, 1-6, **2024**.
3. zur Loye, H.-C., "Molten Salt Crystal Growth of New Actinide Phases", Fall ACS meeting, August 18-22, **2024**.
4. zur Loye, H.-C., Deason, T. K., Tisdale, H., Hines, A., Morrison, G., Besmann, T. M., Mofrad, A., Was, G., Sun, K., Amoroso, J., DiPrete, D., Molten Salt Crystal Growth of Americium Containing Oxides and Fluorides", TMS Meeting, Orlando, March 3-7, **2024**.
5. zur Loye, H.-C., "Hydrothermal Synthesis Using Sub-critical and Critical Reaction Conditions", Quantum Materials Workshop, College Park, Maryland, Jan 14-18, **2024**.
6. zur Loye, H.-C., "Molten Salt Crystal Growth of Americium Oxides and Fluorides", Material Science and Technology Meeting, Columbus, Ohio, October 1-3, **2023**.
7. zur Loye, H.-C., "From Mild Hydrothermal to High Temperature Solutions: Crystal Growth of New Uranium and Transuranium Phases", North American Solid State Chemistry Conference, Calgary, Canada, August 1-7, **2023**.
8. zur Loye, H.-C., "From Mild Hydrothermal To High Temperature Solutions: Strategies For Synthesizing Inorganic Fluorides", International Symposium on Fluorine Chemistry, Quebec City July 22-28, **2023**.
9. zur Loye, H.-C., "Crystal Growth of New Uranium and Transuranic Phases via High Temperature Solution and Mild Hydrothermal Methods: Exploration of New Materials as Potential Nuclear Waste Forms", 18th European Conference on Solid State Chemistry, Prague, Czech Republic, July 9-12, **2023**.

10. zur Loye, H.-C., “Center for Hierarchical Waste Form Materials”, CWHM-Meeting, Pacific Northwest National Laboratory, June 19-22, **2023**.
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23. zur Loye, H.-C., “Materials Assembly and Design Excellence in South Carolina (MADE IN SC)”, 26th NSF EPSCoR National Conference, Columbia, SC, October 27-29, **2019**.
24. zur Loye, H.-C., “Synthesis, Structure and Ion Exchange Potential of New Uranyl Salt Inclusion Phases”, DOE EFRC PI Meeting, Washington DC, July 28-30, **2019**.
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95. zur Loye, H.-C., Bem, D. S., Houmes, J. D., "Synthesis of New Transition Metal Nitrides using Solid State Oxide Precursors: Structure and Properties", Presented at the Meeting of the American Chemical Society, Chicago, IL, August 20-24, **1995**.
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99. zur Loye, H.-C., "Oxygen Ion Conducting Materials" 2nd NSF Materials Chemistry Workshop", St. Louis, Missouri, 13-16 October, **1994**.

100. zur Loye, H.-C., "A Research Overview" Exxon Solid State Chemistry Award Talk, Presented at the Meeting of the American Chemical Society, Washington, D.C., August 21-25, **1994**.
101. zur Loye, H.-C., Nguyen, T.N., "Synthesis, Structure and Properties of a Family of One-Dimensional Chain Compounds: Sr_3MPtO_6 and $\text{Sr}_3\text{MlIrO}_6$ M = Co, Ni, Cu, and Zn", Presented at the Meeting of the American Chemical Society, Washington, D.C., August 21-25, **1994**.
102. zur Loye, H.-C., "New Oxygen Ion Conductors with Intrinsic Vacancies", Presented at the Solid State Chemistry Gordon Conference, Brewster Academy, July 17-22, **1994**.
103. zur Loye, H.-C., "Synthesis of New Ternary Nitrides Using Solid State Oxide Precursors", Presented at the Meeting of the American Chemical Society, San Diego, CA, March 13-18, **1994**.
104. zur Loye, H.-C., "Synthesis of New Nitrides using Solid State Oxide Precursors", Presented at the Materials Research Society Meeting, Boston, MA November 29 - December 3, **1993**.
105. zur Loye, H.-C., "Oxygen Ion Conductivity in a New Class of Layered Bismuth Oxides", Presented at the 9th International Conference on Solid State Ionics, The Hague, The Netherlands, September 12-17, **1993**.
106. zur Loye, H.-C., "New Materials for Solid Oxide Fuel Cells: Novel Intergrowth Structures with Intrinsic Oxygen Vacancies" Presented at the ACS Northeast Regional Meeting, Boston, MA, June 22-25, **1993**.
107. zur Loye, H.-C., Nguyen, T.N., "Electrosynthesis in High Temperature Solutions", Presented at the Meeting of the American Chemical Society, Denver, CO, March 28 - April 2, **1993**.
108. zur Loye, H.-C., Giaquinta, D.M., "Synthesis and Characterization of Layered Transition Metal Oxides", Presented in the CMSE Colloquium Series, MIT, March 19, **1993**.
109. zur Loye, H.-C., Thomas, J.K., Krause, W.E., "New Materials for Solid Oxide Fuel Cells: Novel Intergrowth Structures with Intrinsic Oxygen Vacancies", Presented at the Florida Advanced Materials Chemistry Conference, Palm Coast, FL, March 8-12, **1993**.
110. zur Loye, H.-C., Thomas, J.K., Krause, W.E., "Cation Ordering in Brownmillerite-Perovskite Intergrowth Structures", Presented at the Materials Research Society Meeting, Boston, MA, November 30-December 4, **1992**.

111. zur Loye, H.-C., Giaquinta, D.M., "Flux Synthesis of New Layered Indates: Structures and Properties", Presented at the Meeting of the American Chemical Society, Washington, DC, August 23-28, **1992**.
112. zur Loye, H.-C., Giaquinta, D.M., Papaefthymiou, G.C., Davis, W.M. "Synthesis, Structure and Magnetic Measurements of Some Layered Bismuth Transition Metal Oxides: $\text{Bi}_2\text{M}_{4-x}\text{M}'_x\text{O}_{9+\delta}$ ", Presented at the Meeting of the American Chemical Society, San Francisco, April 5-10, **1992**.
113. zur Loye, H.-C., "Electronic Properties of Layered Bismuth Transition Metal Oxides", Presented at the Florida Advanced Materials Chemistry Conference, Palm Coast, FL, February 17-20, **1992**.
114. zur Loye, H.-C. "Dielectric Response and Conductivity of Poly(Propylene Oxide) Sodium Polyiodide Complexes: Discussion of a Charge Transport Mechanism." Presented at the Solid State Ionics Gordon Research Conference, Colby-Sawyer College, June **1990**.
115. zur Loye, H.-C., Lyons, L.J., Hardy, C. Tonge, J.S., Shriver, D.F., "Polymer Alkali-Metal Polyiodides with Variable Ionic and Electronic Conductivities." Presented at the Materials Research Society Meeting, Boston, MA, November 28 - December 2, **1988**.
116. zur Loye, H.-C.; Staley, R.; Stacy, A.M.; "Magnetic, Infrared and Chemisorption Study of an Epifacial Reaction: Ni on TiO_2 under Reducing Conditions." presented at the Meeting of the American Chemical Society, New Orleans, Louisiana, August 30 - September 4, **1987**.

F. Invited Seminars at Universities and Industrial Research Centers

1. Georgetown University, February **2025**
2. Francis Marion University, November **2024**
3. Oregon State University, May **2024**
4. Georgia Institute of Technology, February **2024**.
5. University of Tennessee, February **2024**.
6. Stony Brook University, October **2023**.
7. Brookhaven National Laboratory, October **2023**.
8. Max Plank Institute, Dresden, Germany, July **2023**.
9. UJV, Prague, April **2023**
10. Oklahoma State University, February **2023**
11. University of South Florida, January **2023**
12. Alfred University, November **2022**
13. Francis Marion University, October **2022**

14. Iowa State University, October **2022**
15. Savannah River National Laboratory, February **2022**
16. University of Marburg, Germany, via zoom, January **2022**
17. University of Köln, Germany, via zoom, November **2021**
18. University of South Carolina, June **2021**
19. Angular Momentum Group, December **2020**
20. Clemson University, via zoom, October **2020**
21. UofSC, via zoom, June **2020**
22. Notre Dame, via zoom, June **2020**
23. Portland State University, February **2020**
24. Winthrop University, February **2020**
25. Furman University, November **2019**
26. Helmholtz Zentrum Dresden, Rossendorf, May **2019**
27. Leipzig, May **2019**
28. Dresden, May **2019**
29. Purdue University, March **2019**
30. University of Alabama, November **2018**
31. Georgetown University, November **2018**
32. Claflin University, February **2018**
33. Wayne State University, October **2017**
34. SRNL, September **2017**
35. University of Louisville February **2017**– Brown& Williamson Distinguished Guest Speaker
36. Oak Ridge National Laboratory August **2016**.
37. Oak Ridge National Laboratory, March **2016**.
38. University of Southern California, October **2015**.
39. Florida State University, October **2013**.
40. University of South Carolina, September **2013**.
41. Chicago – DOE, April **2012**.
42. University of South Carolina, March **2012**.
43. University of Georgia, February **2012**.
44. University of Memphis – ACS Section, December **2011**.
45. ORNL-JINS, October **2011**.
46. University of Houston, September **2011**.
47. Northwestern University, February **2011**.
48. UNC Wilmington, January **2011**.
49. NC State University, October **2010**.
50. Kyoto University, May **2010**.
51. NIMS, Tsukuba, Japan, May **2010**.
52. Max Planck Institut, Stuttgart, Germany, May **2009**.

53. Universite d'Angers, France, October **2008**.
54. Universite d'Angers, France, October **2008**.
55. ICMCB, Bordeaux, France, October **2008**.
56. Zhuhai University, May **2008**.
57. Sun Yat-sen University, May **2008**.
58. Francis Marion University, April **2008**.
59. University of South Carolina, April **2008**.
60. SRNL, April **2008**.
61. Universität Mainz, June **2007**.
62. Universität Köln, June **2007**.
63. Universität Bochum, June **2007**.
64. University of South Carolina, April **2006**.
65. Wright Patterson Air Force Base, March **2006**.
66. George Washington University, February **2006**.
67. Mississippi State University – Engineering, October **2005**.
68. Mississippi State University – Chemistry, October **2005**.
69. Oak Ridge National Laboratory, October **2005**.
70. Shandong Normal University, May **2005**.
71. Lanzhou University, May **2005**.
72. Sun-yat Sen University, May **2005**.
73. University of South Carolina, March **2005**.
74. UC Riverside, November **2004**.
75. Argonne National Laboratory, June **2004**.
76. UC Berkeley, April **2004**.
77. Washington University in St. Louis, April **2004**.
78. Francis Marion University, February **2004**.
79. University of South Carolina, January **2004**.
80. Brookhaven National Laboratory, October **2003**.
81. ICMCB, Bordeaux, France, July **2003**.
82. Louisiana State University, April **2003**.
83. University of Missouri, Columbia, October **2002**.
84. Air Products, September **2002**.
85. Oxford University, January **2002**.
86. Shandong University, May **2001**.
87. Shandong Normal University, May **2001**.
88. Nankai University, May **2001**.
89. UNC Wilmington, October **2000**.
90. University of Muenster, August **2000**.
91. Auburn University, May **2000**.
92. University of Windsor, January **2000**.

93. Air Products, December **1999**.
94. Oak Ridge National Laboratory, October **1999**.
95. Francis Marion University, October **1999**.
96. University of South Carolina, September **1999**.
97. Universite de Picardie Jules Verne, June **1999**.
98. SUNY Stony Brook, June **1998**.
99. Wake Forest University, February **1998**.
100. Purdue University, June **1997**.
101. Clemson University, October **1996**.
102. University of Iowa, June **1996**.
103. Los Alamos National Laboratory, April **1996**.
104. University of South Carolina, April **1996**.
105. Argonne National Laboratory, October **1995**.
106. University of Wisconsin, Madison, October **1995**.
107. Boston College, September **1995**.
108. NRL, Washington, DC, April **1995**.
109. UC Berkeley, April **1995**.
110. UC Davis, April **1995**.
111. Stanford University, April **1995**.
112. University of Texas, Austin, February **1995**.
113. University of Houston, February **1995**.
114. Texas A&M University, February **1995**.
115. McMaster University, February **1995**.
116. 3M, December **1994**.
117. Georgia Tech, November **1994**.
118. University of Victoria, October **1994**.
119. University of Washington, October **1994**.
120. DuPont, September **1994**.
121. Los Alamos National Laboratory, April **1994**.
122. University of Connecticut, April **1994**.
123. Rutgers University, March **1994**.
124. Pennsylvania State University, March **1994**.
125. Brandeis University, January **1994**.
126. Massachusetts Institute of Technology, October **1993**.
127. Dow Chemical Company, April **1993**.
128. Michigan State University, April **1993**.
129. University of Michigan, April **1993**.
130. Northwestern University, April **1993**.
131. Brown University, March **1993**.
132. SUNY Albany, December **1991**.

133. Massachusetts Institute of Technology, October **1991**.
134. Massachusetts Institute of Technology, December **1989**.
135. AT&T Bell Laboratories, March **1989**.
136. Massachusetts Institute of Technology, February **1989**.
137. Ohio State, February **1989**.
138. University of Oregon, January **1989**.
139. Colorado State, December **1988**.
140. University of Rochester, December **1988**.
141. UC Irvine, November **1988**.
142. Northwestern University, September **1988**.
143. Union Carbide, Terrytown, N.Y., December **1987**.

G. Other Seminars and Presentations

College of Arts and Sciences Alumni Council Presentation on Creating Industrial Relationships, April 14, **2015**.

IV. SERVICE

A. Committees

	University
2023-present	USC Faculty Senate
2020-present	University of South Carolina System SRNL Committee
2019-2021	Top Scholar Mentor
2017-2020	Assistant/Associate Dean's Graduate Council
2016-2022	USC NSF GRFP Scholarship Committee
2015-2017	McNAIR Center Steering Committee
2013-2017	USC/SRNL Collaboration Steering Committee
2011-2014	Rising Star Selection Committee
2012-2014	Visiting Scholars Grant Program Selection Committee
2011-present	Committee of Associate Deans
2007-2008	McNair Finalist Mentor
2007	Organizer CAREER Proposal Review and Mentoring
2007	Member South Carolina EPSCoR/IDeA Coalition
2006	Member NSF Advisory Group, USC
2006-2007	Member Search Committee, Dean of the Graduate School, USC
2006-2007	Research Faculty Advisory Group for Innovista
2006-2011	Russell Research Award and USC Educational Foundation Research Award for Science, Mathematics and Engineering Committee. Chair 2010-2011.
2002-2016	University Health and Safety Oversight Committee
2000-2003	Research & Productive Scholarship Selection Committee
1998-2000	Department of Chemistry Senator in the Faculty Senate
1997-present	University Radiation Safety Committee, Chair, 2002-2008, 2009-present.

College

2016	Chair, Search Committee for the Associate Dean for Arts, Humanities and Social Sciences.
2015-2017	College Representative for Recruitment of Graduate Students via Shorelight Education
2013-2017	USC/SRNL Collaboration Steering Committee
2013	HHMI Proposal Committee
2012-present	Member Information Technology Advisory Committee (ITAC)
2012-2015	COEE Math Smart Chair Search Committee
2010	CAS Doctoral Education Retreat Planning Committee
2009-present	CAS Academic Planning Council, ex-officio 2012-present.
2008-2009	Polymer Nanocomposite FEI-CoEE Search Committee
2006-2007	Member Search Committee, Polymer Nanocomposite Center of Excellence Chair, USC

Department

2013-2014	Member Materials Chemist Search Committee.
2012-2013	Inorganic Search Committee.
2011	GAANN Group
2008-2013	Industrial Advisory Board, USC Chemistry
2008	Physical Chemistry Faculty Search Committee
2007-2011	Junior Faculty Mentor (Linda Shimizu and Sheryl Wiskur)
2005-2011	USC Chemistry Department Executive Committee. 2006-2011, chair.
2004-2005	Organic Chemistry Faculty Search Committee
2002-2003	Nanoscience Faculty Search Committee
2001-2002	Chair, Tenure and Promotion Committee

1999-2000	Departmental Moving Committee
1999-2000	Nanoscience Director Search Committee
1999	Ad Hoc committee on Post Tenure Review
1999-present	Seminar Committee
1997-present	Chemistry Major Advisor
1997-2001	Departmental Web Page and Publications Committee
1997-2000	Bouknight Scholarship Selection Committee
1996-2002	Building Committee
1996-2002	Admissions Committee, Chair, 1998-2002 .
1996-2007	Departmental X-ray Policies, Chair, 2000-2007 .
1996-2002	Development Committee

B. Sessions Chaired at Meetings

International Symposium on Fluorine Chemistry, Quebec City July 22-28, **2023**.

North American Solid State Chemistry Conference, Calgary, Canada, August 1-7, **2023**.

14th Pacific Rim Conference on Ceramic and Glass Technology, December 12-17, **2021**, virtual.

Materials Research Society, MRS, Meeting Phoenix AZ, April 2-6, **2018**.

North American Solid State Chemistry Conference, Santa Barbara, CA, August 17-19, **2017**.

DOE Materials Chemistry PI Meeting, Gaithersburg, MD, July 12-14, **2016**.

Gordon Research Conference, Session Chair, Colby Sawyer College, July 22-27, **2012**.

ACS Award in Inorganic Chemistry, ACS Meeting, Anaheim, CA, March **2011**.

SERMACS Meeting, Session Chair, Greenville, SC, October 24-27, **2007**.

Gordon Research Conference, Session Chair, Oxford, England, September 2-7, **2007**.

South Carolina Academy of Science, Annual Meeting, Columbia, SC, April 20, **2007**.

Solid State Chemistry, ACS Meeting, Chicago, IL, March **2007**.

Exxon Mobil Solid State Chemistry Faculty Fellowship Award Symposium, ACS Meeting, Philadelphia, PA, August **2004**.

Metal Oxides, Chair, ACS Meeting, Boston, MA, August **2002**.

Solid State Chemistry of Inorganic Materials: Chair "Session in Honor of George Honig", MRS Meeting, Boston, MA, November **2000**.

New Methods in Solid State Chemistry, ACS Meeting, San Francisco, CA, March **2000**.

Rational Synthesis of Solid State Materials, SERMACS, Research Triangle Park, November **1998**.

Solid State Chemistry of Inorganic Materials: Chair "Synthesis and Reactivity" Poster Session, MRS Meeting, Boston, MA, December **1996**.

Nitrides and Carbides. Pacific Basin Conference, Honolulu, HI, December **1995**.

Covalent Ceramics: Non-Oxides. MRS Meeting, Boston, MA, December **1995**.

C. Symposia and Meetings Organized

Symposium Co-organizer and Co-chair, "Glass and Ceramics for Nuclear Waste Treatment and Sequestration", 14th Pacific Rim Conference on Ceramic and Glass Technologies, Vancouver, BC, Canada, May 23-28, **2021**.

Symposium Co-organizer and Co-Chair "Heavy Element Chemistry Relevant to Nuclear Waste Disposal" Division of Nuclear Chemistry, Meeting of the American Chemical Society, San Francisco, August 16-20, **2020**.

Conference Chair and Meeting Organizer: Gordon Research Conference on Solid State Chemistry, Colby-Sawyer College, July 17- July 22, **2016**

Member of the South East Regional Meeting of the American Chemical Society, SERMACS, **2016** Organizing Committee.

Symposium Co-Chair, Co-Organizer, "17th American Conference on Crystal Growth and Epitaxy", Session on "Novel Materials", Lake Geneva, WI, August 9-14, **2009**.

Symposium Co-Organizer and Co-Chair "Solid State Chemistry", 2007 SERMACS Meeting, Greenville, SC, October 24-27, **2007**.

Organizer and Program Chair of the 2006 Meeting of the South Carolina Academy of Science, Columbia, SC, March 9-10, **2006**.

Exxon Mobil Solid State Chemistry Faculty Fellowship Award Symposium, Meeting of the American Chemical Society, Philadelphia, PA, August 22-26, **2004**.

Nanoscience Symposium, Co-chair, Co-Organizer, SERMACS Meeting, Charleston, SC, **2002**.

Symposium Organizer and Chair: Metal Oxide Symposium, Meeting of the American Chemical Society, Boston, MA, August **2002**.

Symposium Co-Chair, Co-Organizer, "Inorganic Chemistry of Solid State Materials II", MRS Meeting, Boston, MA, December **1998**.

Symposium Co-Chair, Co-Organizer, "Advanced Battery and Fuel Cell Materials": XVII Congress and General Assembly of the IUCr, Seattle, WA, August 9-17, **1996**.

D. Professional Memberships

American Chemical Society

Materials Research Society

Sigma Xi

American Association for the Advancement of Science

South Carolina Academy of Science

American Crystallographic Association

International Precious Metals Institute

The American Ceramic Society

E. Workshops

DOE Workshop: "Frontiers in Materials Discovery, Characterization, and Application, Invited Participant, Chicago, IL, August 2-3, **2014**.

NSF Overview Workshop for Faculty and Staff, University of South Carolina, **2008**.

Air Force Research Laboratory Dielectric Polymer Nanocomposite Workshop, Invited Participant and Presenter. Dayton, OH, June 1, **2007**.

"The Status of Solid State Chemistry and Its Impact in the Physical Sciences", Section Leader on Undergraduate and Graduate Education, Northwestern University, May 18-20, **2006**.

NanoSummit, Washington DC, June 23-24, **2004**.

DOE/EPSCoR Workshop at Argonne National Laboratory, Invited Participant. June 14-15, **2004**.

BES Workshop on Future Directions of Design, Discovery and Growth of Single Crystals for Basic Research, Invited Participant. Ames Lab, Iowa, October 10-12, **2003**.

Elsevier's Editors Conference, Invited Participant. The Lodge, Sonoma, CA, USA, Saturday April 26, **2003**.

F. Proposals Reviewed For

National Science Foundation
DOE Review Panels
Research Corporation
Cottrell
CRDF-CGP
NSF DMR Panels
ACS Petroleum Research Fund
Oak Ridge Associated Universities
NSF Review Panel: Small Business Innovative Research (SBIR)
NSF Review Panel: Major Research Instrumentation (MRI)
NSF Review Panel: Instrumentation for Materials Research (IMR)
NSF Review Panel: Materials Research Science and Engineering Centers (MRSEC)
NSF Review Panel: Inter-American Materials Collaboration
NSF Review Panel: IGERT
NSF Review Panel: Career Awards
ACS Exxon/Mobil Award in Solid State Chemistry
ACS - Travel Awards
South Carolina EPSCoR
DOE Nuclear Program
Helmholtz Foundation
Air Force
Navy
Army
Österreichische Forschungsförderungsgesellschaft
SNS – Neutron Scattering
Romanian Science Foundation
US Civilian Research and Development Foundation
Louisiana EPSCoR
NSERC

G. Papers and Books Reviewed For

Accounts of Chemical Research
Adv. Mat. Opt. Elect.
American Chemical Society
Angewandte Chemie
Chapman & Hall
Chemical Communications
Chemistry a European Journal

Chemistry of Materials
Crystal Engineering Communications
Crystal Growth and Design
Dalton
European Journal of Inorganic Chemistry
Freeman Press
Inorganic Chemistry
Inorganica Chimica Acta
Journal of Alloys and Compounds
Journal of Chemical Crystallography
Journal of Crystal Growth
Journal of Electroceramics
Journal of Materials Chemistry
Journal of Molecular Structure
Journal of Physical Chemistry
Journal of Solid State Chemistry
Journal of the American Chemical Society
Journal of the European Ceramics Society
Materials Research Bulletin
Materials Research Society
New Journal of Chemistry
Polyhedron
Polymer Engineering Science
Science of Advanced Materials
Solid State Communications
Solid State Ionics
Spectro Chimica Acta
Zeitschrift für Anorganische und Allgemeine Chemie

V. RESEARCH GRANTS

A. Funded (As Principal Investigator)

PI	DOE	Crystal Growth of New Complex Actinide Containing Chalcogenides and Oxychalcogenides	\$637,698	2024
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PI	NSF	Exploration of Apatite Room Temperature Superconductor Phase Space	\$300,000	2023
PI	DOE	Supplement: Supporting research to develop phosphate matrices for encapsulating rhenium as a technetium surrogate	\$113,790	2023
PI	SRNL	University of South Carolina Providing Subject Matter Expertise in Critical Material Free Permanent Magnet Characterization	\$10,200	2023
PI	GEAR CRP	GEAR CRP: A Combined Simulation and Experiment Approach to the Design of Mixed-Anion Perovskites for Solar Energy Conversion	\$20,000	2022
PI	DOE	Supplement to EFRC to support Ukrainian Scientists	\$118,950	2022
PI	NSF	Fluoride and Oxyfluoride Materials – Targeting Magnetic and Optical Properties	710,000	2022
PI	DOE	Crystal Growth of New Complex Actinide Containing Oxides, Fluorides and Chalcogenides and the Investigation of their Optical and Magnetic Properties	\$492,000	2021
PI	DOE	EFRC: Center for Hierarchical Waste Form Materials (CHWM)	\$11,200,000	2020
PI	SC EPSCoR	Gear	60,000	2020

PI	VP Research	Magellan Mini Grant “Discovery and Characterization of Novel Crystal Structures through Flux Crystal Growth, Tessa Posey	\$500	2018
PI	VP Research	Magellan “Materials Discovery and Characterization of Luminescent and Scintillating Crystals by Flux Crystal Growth, Grayson Gimblet	\$1,800	2018
PI	Honors College Research Grant	Materials Discovery and Characterization of Reduced Oxides by Flux Crystal Growth – Grayson Gimblet	\$1,500	2018
PI	Honors College Research Grant	Production of Scintillating Nanoparticles – Tessa Posey	\$1,500	2018
PI	ASPIRE	Top-Seeded Solution Crystal Growth Instrument for the Synthesis of Single Crystals of Novel Oxyfluoride Scintillator Materials	\$15,000	2018
PI	DOE	Directed Synthesis of New Actinide Containing Oxides, Fluorides and Chalcogenides	\$477,000	2018
PI	NSF	New Lanthanide-Containing Silicate Fluoride Scintillators for Radiation Detection	\$499,773	2018
PI	SRNL	Site Review of SRNL	\$9,848	2017

PI	DOE	EFRC: Center for Hierarchical Waste Form Materials (CHWM)	\$8,000,000	2016
PI	DOE	Supplement to DE-SC0008664 "Directed Synthesis of New Uranium Containing Materials" to support the purchase of a replacement desktop powder diffractometer	\$30,000	2016
PI	NSF	EAGER: Synthesis of New Ferrolites: Zeolites Containing an All-Iron Framework The First of a New Family of Transition Metal Based Zeolites?	\$155,548	2016
PI	ORNL-HFIR	Investing the magnetic structure and moment of $\text{Ln}_2\text{NiIrO}_6$ (Ln = La, Pr, Nd)	3 days beam time	2016
PI	ORNL-SNS	In-situ Investigation of Flux Crystal Growth through Neutron Diffraction	7 days beam time	2016
PI	SC-EPSCoR	SAN: In-situ Investigation of Molten Flux Crystal Growth of Various Systems through Neutron Diffraction	\$5,129	2016
PI	APS	Resonant Elastic Magnetic X-ray Scattering Investigation of the Novel Series $\text{Ln}_2\text{NiIrO}_6$ (Ln = Sm, Eu, Gd)	3 days	2015

PI	SC-EPSCoR	SAN: Travel Program to Enable Student and Faculty to attend Materials Conference	\$5,000	2015
PI (w/ Ploehn, Chandrashekhar)	ASPIRE	Development of New Hexaferrite Related Multiferroics	\$99,906	2015
PI	DOE	Directed Synthesis of New Uranium Containing Materials: The Use of Functional Building Blocks as Synthetic Tools Coupled with Targeted Crystal Growth Methods to Create New Complex U(VI), U(IV) and U(III) Containing Materials	\$450,000	2015
PI (w/ A. Latshaw)	ORNL-SNS	In-situ Investigation of Flux Crystal Growth through Neutron Diffraction	2 days beam time	2015
PI (w/ M. Chance)	ORNL-SNS	Neutron Diffraction Investigation of a Series of Alkali-Barium Ferrites Structurally Related to Sodalite	4 days beam time	2014
PI	NSF-EPSCoR	Acquisition of a High Sensitivity Analytical Balance to Support Research of an African American Student	\$6,000	2014
PI	NSF	Supplement: Crystal Growth of Luminescent Oxides	\$7,265	2014

PI (w/ Shimizu, Smith)	ASPIRE	Purchase of a Bruker D8 Quest Single Crystal Diffractometer	\$100,000	2014
PI	EFRC	EFRC Seed Fund: Organic/Inorganic Hybrid Nanodielectrics for Solid-State Ultracapacitors	\$40,000	2013
PI	DOE	Supplemental Funding Request for DOE/BES Project 46894	\$96,000	2013
PI (w/ Frank Chen, Andreas Heyden)	ORNL-SNS	<i>In Situ</i> Investigation of the Structure of $\text{Sr}_{0.9}\text{Ti}_{0.8}\text{Nb}_{0.2}\text{O}_3$ Theoretical Prediction of Phase Stability under Reducing Conditions	3 days beam time	2013
PI	NSF	Crystal Growth of Luminescent Oxides	\$460,000	2012
PI (w/ F. Chen, W.M. Chance, C. Yang, G. Xiao, L. Zhang)	ORNL-SNS	In-Situ Investigation of the phase transition between P-PSCFN ($\text{Pr}_{0.4}\text{Sr}_{0.6}\text{Co}_{0.2}\text{Fe}_{0.7}\text{Nb}_{0.1}\text{O}_{3-\delta}$) and K-PSCFN ($\text{Pr}_{0.8}\text{Sr}_{1.2}(\text{Co,Fe})_{0.8}\text{Nb}_{0.2}\text{O}_{4+\delta}$)	4 days beam time	2012
PI (w/ T. Egami, Q. Zhao)	ORNL-SNS	Investigation of the Structure Transition in $\text{Sr}_5\text{Co}_4\text{O}_{12}$	2 days beam time	2012
PI (w/ A. Cortese, T. Egami, G. Granroth)	ORNL-SNS	Investigation of the Oxidation States in $\text{Sr}_5\text{Co}_4\text{O}_{12}$	2 days beam time	2012

PI	SC-EPSCoR	SAN: Student and Faculty Exchange Program	\$4,000	2012
PI	ORNL-SNS	High Resolution Optical Microscope to Support the Single Crystal Facility at Claflin University	\$6,000	2012
PI	ORNL-SNS	Investigation of Perovskite- K_2NiF_4 Phase Transition	1 day beam time	2012
PI (w/ T. Egami, Q. Zhao)	ORNL-SNS	Investigation of the Structure Transition in $Sr_5Co_4O_{12}$	2 days beam time	2012
PI (w/ Bryson, Shimizu, Wang)	Dept. of Education	GAANN Fellowship Program in the USC Department of Chemistry and Biochemistry	\$399,798	2012
PI (w/ W.M. Chance, F. Chen, G. Xiao, C. Yang, L. Zhang)	ORNL-SNS	Investigation of the phase transition between P-PSCFN ($Pr_{0.4}Sr_{0.6}Co_{0.2}Fe_{0.7}Nb_{0.1}O_{3-\delta}$) and K-PSCFN ($Pr_{0.8}Sr_{1.2}(Co,Fe)_{0.8}Nb_{0.2}O_{4+\delta}$)	1 day beam time	2012
PI	DOE	A Synthetic Strategy to Prepare New Complex Uranium- and Thorium-Containing Oxides: Predictive Solid State Synthesis of New Composition using Radius Ratio Rules and Materials Discovery based on Crystal Growth from High Temperature Solutions	\$420,000	2011

PI	ORNL-SNS	In Situ Investigation of Oxygen Vacancies in the SOFC Material $\text{Sr}_2\text{Fe}_{1.5}\text{Mo}_{0.5}\text{O}_{6-\delta}$ under Oxidizing and Reducing Conditions at High Temperatures	3 days beam time	2011
PI	ORNL-SNS	IPTS-4790, "Magnetic structure determination of the double perovskites $\text{La}_2\text{NaOsO}_6$ and $\text{La}_2\text{NaRuO}_6$ "	2 days beam time	2011
PI	NSF	REU: Materials Discovery by Crystal Growth: A Synthetic Strategy to Prepare Complex Oxides from High Temperature Solutions	\$11,250	2010
PI	USC	MGS – Crystal Growth of Antimony and Gallium Containing Complex Oxides	\$3,000	2010
PI	SRNL-SCUREF	SC0230 – Amide Borohydride Structural Analysis	\$51,171	2009
PI	SRNL-SCUREF	SC0240 Perform Analysis of Ionic Liquids	\$11,470	2009
PI	NSF	Supplement to DMR: 0804209 to Support Summer Undergraduate Research	\$7,708	2009
PI	SCAS	Operating Support for the Journal of the South Carolina Academy of Science	\$2,000	2009

PI	SRNL-SCUREF	Amide/Borohydride Structural Analysis	\$37,391	2008
PI	VP Research	Magellan Scholar Fellowship: Adam Fox, "Crystal Growth of Palladium (IV) Oxides"	\$2,500	2008
PI	Air Force SBIR	Nanodielectrics for High Energy Density Capacitors	\$2,500	2008
PI (w/ H. Ploehn)	Air Force	Reduced Size and Weight Devices for Weapons Systems Activation: New Nanocomposite Materials for High Energy Storage Systems	\$700,667	2007
PI	NSF	Materials Discovery by Crystal Growth: A Synthetic Strategy to Prepare Complex Oxides from High Temperature Solutions	\$260,000	2007
PI (w/ H. Ploehn)	DoD EPSCoR	Polymer Nanocomposites as Future Materials for Defense and Energy Applications: High Energy Density Storage Systems with Reduced Size and Weight for Pulse Power Applications	\$750,000	2007
PI	Michelin	Synthesis of Covalently Modified Organo Platelet Materials for Use in Rubber Based Nanocomposites	\$42,803	2007
PI	NSF	Preparation of New Organic/Inorganic Hybrid	\$195,000	2006

Materials: A Multi-Disciplinary Approach to Integrate Research and Undergraduate Education

PI	PBI Performance Products	Synthesis of Perovskite Materials	\$7,100	2006
PI (w/ H. Ploehn)	Air Force	Polymer Nanocomposites as Future Materials for Defense and Energy Applications	\$901,480	2006
PI	VP Research	Magellan Scholar Fellowship: Meredith Tershansy, "The Synthesis, Structural Determination, and Optical Characterization of New Mixed-Metal Bismuth Halide Systems"	\$3,000	2006
PI	VP Research	Magellan Scholar Fellowship: Zeeshan Kaliq, "Organic Ligand Synthesis and Preparation of New Organic/Inorganic Hybrid Materials"	\$3,000	2006
PI	SC EPSCoR	Support for a Summer Research Experience of a K-12 Teacher	\$2,000	2006
PI	NSF	Supplement to NSF Grant to Support Middle School Teacher for the summer	\$6,497	2006
PI	Michelin	Synthesis of Covalently Modified Organo Platelet Materials for Use in Rubber Based Nanocomposites	\$85,600	2006

PI	NIST	Investigation of Structural Phase Transitions in Ba ₂ LuBiO ₆ and Ba ₂ YbBiO ₆	3 days beam time	2006
PI	Nanocenter	Polymer Nanocomposites Group	\$90,000	2006
PI	SC EPSCoR	Support for the South Carolina Academy of Science Annual Meeting to be held at USC-Columbia March 10, 2006	\$2,000	2006
PI	SC EPSCoR	Planning Grant to Develop an I/UCRC and GOALI for Polymer Nanocomposites	\$3,000	2005
PI	BNL	TEM time – Center for Functional Nanomaterials "TEM Investigation of Titanium Phosphonate ‘Nano-rolls’"	4 days beam time	2004
PI	NSF	Synthesis of New Platinum Group Metal Oxides	\$390,000	2004
PI	BRIN EPSCoR	Systematic Investigation of Modified Amino Acid–Rare Earth Framework Materials: Potential MRI Imaging Agents	\$5,100	2004
PI	BNL	NSLS time – Center for Functional Nanomaterials Proposal	12 days beam time	2003

PI	BNL	NSLS time – general user proposal	24 days beam time	2003
PI	DOE/ EPSCoR	Structural Investigations of Complex Oxides Using Synchrotron Radiation	\$494,934	2003
PI	NIST	Neutron Diffraction Time	3 days beam time	2003
PI	Nano Thrust	Polymer Nanocomposites	\$60,000	2003
PI	NSF	RUI - Preparation of New Organic/Inorganic Hybrid Materials: A Multi-Disciplinary Approach to Integrate Research and Undergraduate Education	\$170,000	2003-06
PI	Air Products	Investigation of the Reaction between Carbon Dioxide and Transition Metal Oxides	\$50,000	2002-03
PI	USCRF	Polymer Nanocomposites	\$50,000	2002-03
PI (w/ LeRoy Peterson)	BRIN/EPSCoR	A Joint Francis Marion University/University of South Carolina Program to Synthesize and Characterize New Organic/Inorganic Coordination Framework Materials	\$75,000	2002
PI	PRF	Proposal for Support of the ACS Symposium – Metal Oxides held	\$2,400	2002

at the 2002 Fall ACS meeting in
Boston, MA, August 18-22, 2002

PI	NSF	Proposal for Support of the ACS Symposium - Metal Oxides to be held at the 2002 Fall ACS meeting in Boston, MA, August 18-22, 2002	\$5,000	2002
PI	Air Products	Investigation of the Reaction between Carbon Dioxide and Transition Metal Oxides	\$79,000	2001
PI	PRF	Supplement for PRF grant to support summer researcher	\$8,000	2001
PI	NSF	Synthesis of New Perovskite Related Oxides	\$389,000	2001
PI	PRF	Synthesis of Functionalized Organic-Inorganic Coordination Polymers	\$60,000	2000
PI	Air Products	Investigation of the Reaction between Carbon Dioxide and Transition Metal Oxides	\$78,421	2000
PI	CHE, SC Research Grant Program	Organic-Inorganic Coordination Polymers	\$131,870	2000

PI (w/ B. Haran, B. Popov)	CHE, SC Research Grant Program	Studies on High Performance Supercapacitors Based on RuO _x -Carbon Electrodes	\$103,200	1999
PI	Air Products	Investigation of the Reaction between Carbon Dioxide and Transition Metal Oxides	\$77,651	1999
PI	DOE EPSCoR	DOE EPSCoR	\$100,000	1999
PI (w/ R. Adams, U. Bunz, C. Murphy, D. Reger, K. Shimizu)	NSF	Purchase of a Single Crystal CCD Area Detector X-ray Diffraction System	\$134,200	1999
PI	NSF	Investigation of New Magnetic Oxides with Low-Dimensional Structures	\$378,262	1998
PI	Air Products	Investigation of the Reaction between Carbon Dioxide and Transition Metal Oxides	\$135,907	1998
PI (w/ U. Bunz, K. Shimizu)	Venture Fund	New Layered Organic-Inorganic Materials: An Assembly of Inorganic Building Blocks and Supramolecular Materials	\$30,000	1998
PI	BNL	Synchrotron Time: Diffraction Studies of One-Dimensional Oxides	10 days beam time	1997

PI (w/ R. Adams, B. Dunlap, C. Murphy, J. Tour)	NSF	Purchase of a Squid Magnetometer	\$85,700	1996
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B. Funded (As Co-PI/Contributor)

<u>Role</u>	<u>Granting Agency</u>	<u>Project Title</u>	<u>Award Amount</u>	<u>Year</u>
Co-PI Morgan Stefik, PI	DOE	Understanding the Role of Defects to Accelerate Wadsley- Roth Niobates for Long-Duration Energy Storage	\$467,500 to HzL	2022
Co-PI, Ashutosh Goel, Rutgers, PI	ARPA-E	Pioneering A Cermet Waste Form For Disposal Of Waste Streams From Advanced Reactors (Pace-Forward)	4,000,000 \$526,000 to HzL	2022
Institutional Director	NSF-EPSCoR	Made in SC	20,000,000	2018
Co-PI with Haj- Hariri, Ritter, Reynolds, Mousseau	SRNL	External Review of the Core Competencies of SRNL	\$33,979	2016
Co-PI (w/ Clemson, Alabama)	NSF-EPSCoR	Radioluminescent Particles for Optical Emission in Optogenetics	\$375,000 to HzL	2016-20
Co-PI (w/ A. Bombardi, C. Mazzoli)	Diamond	Exploring the valence disproportionation in 2H- perovskites related oxides	3 days beam time	2013
Co-PI (w/ A. Bombardi, C. Mazzoli)	Diamond	Investigation of the Resonant Behavior of Ruthenates 2H Perovskites	3 days beam time	2013

Co-PI (w/ Chen, Heyden)	ASPIRE	Design and Discovery of Novel Electrode Materials for Reversible Solid Oxide Cells	\$100,000	2013
Co-PI (w/ H. J. Ploehn, B. Benicewicz)	NASA REAP	Polymer-Grafted Platelet Nanocomposites for Engineered Materials and Structures in Extreme Environments	\$30,000	2012
Co-PI (w/ H. J. Ploehn, B. Benicewicz)	ASPIRE	A Materials Toolbox Approach for Synthesis and Characterization of Polymer Nanocomposites	\$100,000	2012
Co-PI (w/ Takeshi Egami, many Co-PIs)	DOE/ EPSCoR	Neutron Scattering Research Network for EPSCoR States	\$90,000	2011
Co-PI (w/ Dawson, Adams, Garashchik, Rassolov, Shimizu)	NSF	Computer Cluster for wide range chemical applications	\$285,958	2010
Co-PI (w/ F. Chen, Reifsnider, Weidner)	NASA	Development of High Power Density Regenerative Bi- electrode Supported Solid Oxide Cells to Support NASA's Planetary Exploration Missions	\$740,000 + \$543,750 cost share	2010
Co-PI (w/ Lavigne, Reger, Shimizu, Wang)	EPSCoR	Acquisition of a Modulated DSC	\$45,000	2008

Co-Pi (w/ P. Maggard)	NSF	Sermacs Funding: Solid-State Chemistry: New Materials and Advances	\$4,770	2007
Co-Pi (w/ H. Ploehn)	USC OH&HS	Acquisition of a Micro-Compounder for Polymer Materials Research	\$85,680	2006
Co-Pi (w/ H. Ploehn, W. Sandberg)	NSF	Polymer Nanocomposite Manufacturing Partnership	\$600,000	2006
Co-Pi (w/ Shiou-Jyh, Wilkinson)	NSF	Subcontract for NSF Solid State Chemistry Summer Program	\$550,000	2003-05
Co-Pi (w/ Papathanasiou, Ploehn, Scrivens)	Opportunity Grant	Polymer/Clay Nanocomposites	\$187,993	2001
Co-Pi (w/ Shiou-Jyh Hwu, Wilkinson)	NSF	NSF Solid State Chemistry Summer Program	\$290,000	2001
Co-Pi (w/ Bunz, Reger, Shimizu)	USC	Seed Funds	\$50,000	2001

Co-Pi (w/ C. J. Murphy)	NSF	REU Site-Undergraduate Research in Nanoscience	\$180,000	2001
Co-Pi (w/ Murphy, Bunz)	NSF REU	NSF Research Experience for Teachers. Supplement to NSF REU	\$10,000	2001
Co-Pi (w/ many Chemistry co-PIs)	NSF REU	Undergraduate Research in Nanoscience	\$150,000	1998
Co-Pi (w/ S. Kauzlarich, A. Sleight, E. McCarron III)	NSF	Solid State Chemistry of Inorganic Materials II – Symposium DD	\$10,000	1998
Co-Pi (w/ M. Myrick, B. Popov, T. Bryson)	DOD	Remote Sensing of Chemical Warfare Agents	\$1.3 million	1997
Multi-Investigator, Chem. & Chem. Eng. (w/ M. Amiridis)	DOE	EPSCoR: Hydrogen Production via Direct Cracking of Hydrocarbons	\$2.0 million	1997
Co-Pi (w/ Dunlap, Tour, Angel, Berg, Murphy, Myrick, Ploehn, Shaw)	NSF	EPSCoR-Optics	\$1,518,096	1996

VI. TEACHING

A. Graduate Student Supervision

Dr. Navindra Keerthisinghe December **2024**, Mild Hydrothermal Crystal Growth for Complex Inorganic Metal Fluorides.

Dr. Adrian Hines, December **2023**, Investigation, Synthesis and Rational Design of Novel Transuranic Containing Extended Structures.

Adam King, M.S., **2023**, Synthesis of New Thiosilicates and Germanates.

Dr. Logan Breton, December **2023**, “Expanding on the Solid State Chemistry of f-element Chalcogenides”.

Dr. Darren A. Carone, December **2022**, “Materials Discovery By Flux Crystal Growth: Synthesis, Structure Determination, Magnetic, And Optical Properties Of Complex Oxides, Oxychlorides, And Oxyfluorides”.

Dr. Gyanendra B. Ayer, May **2022**, “Crystal Growth Of Inorganic Halides And Oxide-Halides For Scintillation Applications And Radiation Detection”.

Dr. Mohammad Usman, May **2021**, “Molten Alkali Halide Salt-Flux Crystal Growth and Physical Property Determination of Complex Oxides And Chalcogenides Supported by First Principles Density Functional Theory Calculations”.

Dr. Kristen A. Pace, December **2020**, “Synthetic Strategies For The Preparation Of Novel Complex Actinide Oxides And Fluorides”.

Dr. Christian A. Juillerat, August **2020**, “Exploratory Molten Flux Crystal Growth of Complex Uranium Oxides”.

Dr. Timothy Ferreira, August **2018**, “Crystallomagnetic Studies of First and Third Row Transition Metal Containing Oxides Grown Via the Molten Flux Method”.

Dr. Justin Felder, May **2018**, “Hydrothermal Synthesis: A Gateway to Metastable Crystals with Unusual Properties”.

Dr. Dileka Abeysinghe, August **2017**, Materials Discovery of Reduced Early Transition Metal Compounds: Crystal Growth and Characterization”.

Dr. Allison M. Latshaw, August **2016**, “Materials Discovery by Crystal Growth: Synthesis, Structure Determination, Magnetic, and Optical Properties of Complex Lanthanide Containing Oxides, Oxyhydroxides, and Oxyfluorides”.

Dr. Anthony J. D. Cortese, May **2016**, "Crystal Growth and Characterization of Reduced Early Transition Metal Compounds Grown via Hydrothermal and Molten Flux Methods".

Dr. Cory M. Read, May **2015**, "Discovery of Novel Uranium-Containing Oxides and Related Materials by Flux Crystal Growth".

Dr. Michael Chance, May **2014**, "Hydroflux Synthesis: A New and Effective Technique for Exploratory Crystal Growth".

Dr. Shae Vaughn, May **2012**, "Synthesis of Inorganic-Organic Hybrid Materials Designed for Radiation Detection, Luminescence and Gas Storage".

Dr. Rachael Severance, May **2012**, "Separation and Coordination Chemistry of Actinides".

Dr. Qingbiao Zhao, Ph.D., May **2011**, "Crystal Growth, Structure Determination and Physical Property of Complex Oxides."

Dr. Arief Wibowo, Ph.D., May **2011**, "Bismuth-, Tin- and Lead-Containing Metal-Organic Materials: Synthesis, Structure, Photoluminescence, Second Harmonic Generation, and Ferroelectric Properties."

Zhichao Shan, M.S., May **2011**, "Photoluminescence Properties of Rare Earth Niobium Containing Oxides and Flux Synthesis of Rare Earth Transition Metal Containing Oxides".

Dr. Irina Roof, Ph.D., May **2010**, "Materials Discovery by Crystal Growth: Synthesis, Structure Determination and Physical Properties of Complex Oxides of Niobium, Tantalum, Iron and Uranium."

Dr. Peter Barber, Ph.D., May **2010**, "Synthesis and Characterization of Mixed-Metal Phosphonates for Polymer Dielectric Composite Materials."

Shushan Gong, May **2010**, M.S., "Preparation of Polymer Composites as Dielectric Materials for Capacitors."

Dr. Joseph Ellsworth, Ph.D., May **2008**, "Coordination Polymers: Hybrid Materials Composed of Organic Ligands and Transition Row Metals."

Dr. Tara Hansen, Ph.D., December **2007**, "Synthesis and Characterization of Oxide Materials: Polymer-Layered Oxide Nanocomposites and Lanthanide Containing Platinates."

Dr. Samuel Mugavero, III, Ph.D., August **2007**, "Synthesis and Characterization of Complex Oxides of Iridium and Palladium."

Dr. William Gemmill, Ph.D., August **2006**, "Synthesis, Structural Characterization, and Magnetic Properties of Complex Oxides of Ruthenium and Osmium."

John Stone, May **2006**, M.S., "Preparation and Characterization of Polymer Nanocomposites Containing Metal Phosphonates."

Dr. Andrea M. Goforth, Ph.D., December **2005**, "Synthesis, Structural Characterization, and Optical Properties of Several Novel Mixed-Metal Iodobismuthate Materials."

Judith N. Mwamuka, M.S., May **2004**, "Control of Inorganic Crystal Growth for Magnetic and Biological Applications."

Dr. Matthew Davis, Ph.D., **2004**, "The Chemistry of Novel Perovskite-Related Oxides: Synthesis, Structural Determination and Magnetic Property Characterization."

Dr. Katharine Stitzer, Ph.D., **2002**, "Crystal Growth, Structure Determination, and Magnetic Properties of Ternary and Quaternary Rh, Ir, Ru and Os Containing Oxides".

Dr. Delia Ciurtin, Ph.D., **2002**, "Synthesis and Characterization of New Inorganic-Organic Coordination Polymer".

Dr. Jeff Fiscus, Ph.D., **2002**, "Synthesis, Characterization and Application of Solid State Materials: Oxides, Catalysts and Coordination Polymers".

Dr. Shalawn Kirkland Jackson, Ph.D., **2001**, "Synthesis and Characterization of Transition Metal Nitride Materials".

Ioana Vidican, M.S., December **2000**, "High Performance Mix Design Using Chemistry".

Patrick Smallwood, M.S., December **1999**, Master's Degree, "The Flux Synthesis of Transition Metal Oxides and Investigation of the Reaction of Ternary Transition Metal Oxides with Carbon Dioxide".

Dr. Jennifer Pell, Ph.D., May **1999**, "I. Sol Gel Deposition of Oxide Ion Conducting Thin Films. II. Liquid Precursors to Hafnium and Tantalum Carbides".

Dr. Carlos Navas, Ph.D., February **1999**, "Synthesis, Electrical Conductivity and Nonstoichiometry of Doped Layered Perovskites".

Dr. Joel D. Houmes, Ph.D., September **1996**, "New Routes to Nitride Material: Oxide Precursors and Nitrogen Plasmas".

Dr. Kurt R. Kendall, Ph.D., September **1996**, "Rational Design and Synthesis of New Oxide Ion Conductors".

Dr. David S. Bem, Ph.D., May **1995**, "Synthesis of New Ternary Nitrides."

Dr. Julie K. Thomas, Ph.D., September **1994**, "Oxygen Ion Conduction in Layered Intergrowth Structures with Intrinsic Oxygen Vacancies."

Dr. Tu N. Nguyen, Ph.D., May **1994**, "Electrosynthesis and Characterization of Main Group and Transition Metal Oxides."

Dr. Daniel M. Giaquinta, Ph.D., February **1994**, "Synthesis and Characterization of New Layered Main-Group-Transition Metal Oxides."

B. Undergraduate Student Supervision

University of South Carolina

Ethan Adams, Fall **2023-2025**

Haizley Herndon, FMU Undergrad, Summer **2023**

Alexander Smith, FMU Undergrad, Summer **2023**

Cyrus Ingram, FMU Undergrad, Summer **2023**

Pilar Zamorano, Spring **2022 - 2025**

Virginia Jones, Spring **2022 - 2024**

Grayson Gimblet, Spring **2017 - 2020**

Tessa Posey, Spring **2017 - 2020**

Nicholas Spagnuolo, Spring **2017 - 2019**

John Estock, SPRI student, Summer **2018**

Branford Wilkins, Spring **2013 - 2016**.

Alexis Meyers, SPRI student, Summer **2013**.

Kendall Hughey, ACS Chemistry major, Fall **2012**.

Ben Hardaway, SPRI student, Summer **2012**.

Lauren Grabowski, Summer **2012**.

Nathan Trenor, Spring **2011**.

Ankur Patel, Spring **2011**.

Eric Rountree, Summer **2010**.

Elisabeth Rausch, Fall **2009**.

Kristina Wichmann, Fall **2009**.

Jacqueline Cantwell, Fall **2009 - Spring 2012**.

Chavis Stackhouse, Summer **2009 - Spring 2012**.

Wolfgang Zeier, Summer, Fall **2008**.

Thomas Jagau, Summer, Fall **2008**.

Heidi Houghton, Summer **2007**.

Adam Fox, Spring **2007 - Spring 2009**.

Jilian McAlum, Spring **2007**.

Mike Burns, Summer **2006**.

Kathryn Seward, Summer, Fall **2006**, Spring **2007**, Summer **2007**.

Zeeshan Khaliq, Spring, Summer, Fall **2006**.
Meredith Tershansy, Fall **2004** – Fall **2006**, Spring **2007**, Summer **2007**.
Rachel Hipp, Summer **2004**, Spring **2005**.
Doug Perkins, Spring **2004** – Fall **2004**.
Matt Remy, Summer **2004**.
Irina Puzdrjakova, Summer **2004**, Summer **2005**.
Danielle Sweetapple, Fall **2003**.
Samuel J. Mugavero III, Summer **2003**.
Katarzyna Glab, Summer **2003**, Spring **2004**.
John Stone, Summer **2002**.
Harvey Davis, Summer **2002**.
Yunhui Li, Summer **2002**.
Will Gemmill, Summer **2002**.
Tara Hansen, Summer **2002**.
Jennifer Napper, Summer **2002**.
Kathrine Gerth, Summer **2001**.
Craig Chapman, Summer **2001**.
Judy Mwamuka, Summer **2001**.
Tim Brooch, Summer **2001**.
Kit Seawright, Summer **2000**.
Gerard Rowe, Summer **2000**.
Matthew Davis, Summer **1999**.
Patrick Smallwood, Summer **1997**.
Christopher McEaching, Summer **1997**.
Ham Hanley, Summer **1997**, **1997** – **1999**.

Massachusetts Institute of Technology

Sally Daganzo, Summer **1996**.
Katya Delak, **1995** – **1996**.
Sandhya Deo, **1995** – **1996**.
Steve Morse, **1994**.
Hans Olsen, **1993** – **1994**.
Mairin Anderson, **1993** – **1994**.
Wendy Krause, **1992** – **1993**.
Heather Williamson, **1992** – **1993**.
Ken Ellis, **1990** – **1991**.

C. Courses Taught

University of South Carolina

<u>Semester/Quarter</u>	<u>Course Number</u>	<u>Course Description</u>	<u>Number of Students</u>
Fall 2023	899	Dissertation Preparation	4
Fall 2023	898	Research in Chemistry	3
Fall 2023	790	Introduction to Research	1
Fall 2023	713	Chemistry of the Elements	6
Fall 2023	496	Undergraduate Research	1
Summer 2023	899	Thesis Preparation	4
Summer 2023	898	Research in Chemistry	5
Spring 2023	899	Dissertation Preparation	4
Spring 2023	898	Research in Chemistry	4
Spring 2022	791	Introduction to Research	3
Fall 2022	899	Dissertation Preparation	4
Fall 2022	898	Research in Chemistry	4
Fall 2022	790	Introduction to Research	3
Fall 2022	713	Chemistry of the Elements	4
Summer 2022	899	Thesis Preparation	4
Summer 2022	898	Research in Chemistry	2
Spring 2022	899	Dissertation Preparation	5
Spring 2022	898	Research in Chemistry	5
Spring 2022	791	Introduction to Research	1
Fall 2021	899	Dissertation Preparation	3
Fall 2021	898	Research in Chemistry	4
Fall 2021	790	Introduction to Research	1
Summer 2021	899	Thesis Preparation	3
Summer 2021	898	Research in Chemistry	4
Spring 2021	899	Dissertation Preparation	3
Spring 2021	898	Research in Chemistry	5
Spring 2021	791	Introduction to Research	2
Fall 2020	899	Dissertation Preparation	4
Fall 2020	898	Research in Chemistry	5
Fall 2020	790	Introduction to Research	2
Summer 2020	899	Thesis Preparation	3
Summer 2020	898	Research in Chemistry	6
Spring 2020	899	Dissertation Preparation	3
Spring 2020	898	Research in Chemistry	4
Spring 2020	791	Introduction to Research	2
Spring 2020	499	Senior Thesis Project	1

Spring 2020	499	BMEN-Biomedical Engineering	1
Fall 2019	899	Dissertation Preparation	3
Fall 2019	898	Research in Chemistry	4
Fall 2019	790	Introduction to Research	3
Fall 2019	499	Senior Thesis Project	1
Summer 2019	713	Chemistry of the Elements	1
Summer 2019	496	Undergraduate Research	1
Summer 2019	899	Thesis Preparation	1
Summer 2019	898	Research in Chemistry	5
Spring 2019	791	Introduction to Research	2
Spring 2019	899	Dissertation Preparation	1
Spring 2019	898	Research in Chemistry	4
Fall 2018	898	Research in Chemistry	5
Fall 2018	790	Introduction to Research	2
Summer 2018	898	Research in Chemistry	5
Spring 2018	399	Independent Study	1
Spring 2018	791	Introduction to Research	3
Spring 2018	899	Dissertation Preparation	2
Spring 2018	898	Research in Chemistry	3
Fall 2017	899	Dissertation Preparation	2
Fall 2017	898	Research in Chemistry	3
Fall 2017	790	Introduction to Research	3
Summer 2017	899	Dissertation Preparation	3
Summer 2017	898	Research in Chemistry	3
Spring 2017	899	Dissertation Preparation	3
Fall 2016	899	Introduction to Research	3
Fall 2016	713	Chemistry of the Elements	20
Summer 2016	899	Thesis Preparation	2
Summer 2016	898	Research in Chemistry	2
Spring 2016	899	Dissertation Preparation	3
Spring 2016	898	Research in Chemistry	2
Fall 2015	898	Research in Chemistry	3
Fall 2015	899	Introduction to Research	2
Fall 2015	499	Undergraduate Research	1
Fall 2015	713	Chemistry of the Elements	14
Summer 2015	899	Thesis Preparation	1
Summer 2015	898	Research in Chemistry	4
Spring 2015	899	Dissertation Preparation	1
Spring 2015	898	Research in Chemistry	4
Spring 2015	791	Introduction to Research	1
Fall 2014	898	Research in Chemistry	6
Fall 2014	791	Introduction to Research	2
Fall 2014	790	Introduction to Research	2

Fall 2014	713	Chemistry of the Elements	18
Summer II 2014	898	Thesis Preparation	4
Summer I 2014	898	Research in Chemistry	4
Spring 2014	899	Dissertation Preparation	1
Spring 2014	898	Research in Chemistry	4
Spring 2014	791	Introduction to Research	2
Spring 2014	496	Undergraduate Research	1
Fall 2013	898	Research in Chemistry	5
Fall 2013	791	Introduction to Research	1
Fall 2013	790	Introduction to Research	2
Fall 2013	713	Chemistry of the Elements	11
Fall 2013	497	Undergraduate Research	1
Summer II 2013	898	Thesis Preparation	5
Summer I 2013	898	Research in Chemistry	5
Summer I 2013	701	Seminar	5
Spring 2013	899	Dissertation Preparation	2
Spring 2013	898	Research in Chemistry	1
Spring 2013	791	Introduction to Research	1
Fall 2012	899	Dissertation Preparation	2
Fall 2012	898	Research in Chemistry	1
Fall 2012	790	Introduction to Research	1
Fall 2012	713	Chemistry of the Elements	9
Fall 2012	497	Undergraduate Research	1
Fall 2012	496	Undergraduate Research	1
Summer II 2012	899	Dissertation Preparation	2
Summer II 2012	898	Research in Chemistry	1
Summer I 2012	899	Dissertation Preparation	3
Summer I 2012	898	Research in Chemistry	1
Summer I 2012	701	Seminar	2
Spring 2012	899	Dissertation Preparation	3
Spring 2012	898	Research in Chemistry	1
Spring 2012	701	Introduction to Research	4
Spring 2012	499	Undergraduate Research	1
Fall 2011	899	Dissertation Preparation	3
Fall 2011	898	Thesis Preparation	2
Fall 2011	399	Independent Study	1
Summer II 2011	899	Dissertation Preparation	3
Summer II 2011	898	Thesis Preparation	3
Summer I 2011	899	Dissertation Preparation	2
Summer I 2011	898	Research in Chemistry	4
Summer I 2011	701	Seminar	1
Spring 2011	899	Dissertation Preparation	1
Spring 2011	898	Research in Chemistry	6

Spring 2011	791	Introduction to Research	4
Spring 2011	496	Undergraduate Research	3
Spring 2011	701	Seminar	10
Spring 2011	112	General Chemistry	180
Fall 2010	899	Dissertation Preparation	3
Fall 2010	898	Thesis Preparation	3
Fall 2010	713	Chemistry of the Elements	11
Spring 2010	790	Introduction to Research	1
Spring 2010	498	Undergraduate Research	1
Summer II 2010	899	Dissertation Preparation	3
Summer II 2010	898	Thesis Preparation	1
Summer II 2010	799	Thesis Preparation	3
Summer I 2010	899	Dissertation Preparation	2
Summer I 2010	799	Thesis Preparation	1
Summer I 2010	701	Seminar	3
Spring 2010	899	Dissertation Preparation	5
Spring 2010	799	Thesis Preparation	2
Spring 2010	791	Introduction to Research	2
Spring 2010	497	Undergraduate Research	1
Summer II 2010	899	Dissertation Preparation	3
Summer II 2010	898	Thesis Preparation	1
Summer II 2010	799	Thesis Preparation	3
Summer I 2010	899	Dissertation Preparation	2
Summer I 2010	799	Thesis Preparation	1
Summer I 2010	701	Seminar	3
Spring 2010	899	Dissertation Preparation	5
Spring 2010	799	Thesis Preparation	2
Spring 2010	791	Introduction to Research	2
Spring 2010	497	Undergraduate Research	1
Spring 2010	701	Seminar	8
Spring 2010	112	General Chemistry	161
Fall 2009	899	Dissertation Preparation	5
Fall 2009	799	Thesis Preparation	2
Fall 2009	713	Chemistry of the Elements	12
Spring 2009	498	Undergraduate Research	1
Spring 2009	496	Undergraduate Research	1
Summer II 2009	899	Dissertation Preparation	5
Summer II 2009	898	Thesis Preparation	2
Summer I 2009	899	Dissertation Preparation	3
Summer I 2009	799	Thesis Preparation	4
Spring 2009	112	General Chemistry	185
Spring 2009	899	Dissertation Preparation	2
Spring 2009	799	Thesis Preparation	4

Spring 2009	790	Introduction to Research	2
Spring 2009	701	Seminar	2
Fall 2008	713	Chemistry of the Elements	12
Fall 2008	799	Thesis Preparation	3
Fall 2008	899	Dissertation Preparation	2
Summer II 2008	799	Thesis Preparation	3
Summer II 2008	898	Research in Chemistry II	1
Summer II 2008	899	Dissertation Preparation	2
Summer I 2008	898	Research in Chemistry II	1
Summer I 2008	899	Dissertation Preparation	2
Spring 2008	112	General Chemistry	184
Spring 2008	497	Undergraduate Research	2
Spring 2008	701	Seminar	5
Spring 2008	898	Research in Chemistry I	1
Spring 2008	899	Dissertation Preparation	2
Fall 2007	496	Undergraduate Research	2
Fall 2007	498	Undergraduate Research	1
Fall 2007	713	Chemistry of the Elements	7
Fall 2007	790	Introduction to Research	1
Fall 2007	799	Thesis Preparation	1
Fall 2007	898	Research in Chemistry II	3
Fall 2007	899	Dissertation Preparation	3
Summer II 2007	798	Research in Chemistry I	1
Summer II 2007	898	Research in Chemistry II	4
Summer II 2007	899	Dissertation Preparation	1
Summer I 2007	898	Research in Chemistry II	3
Summer I 2007	899	Dissertation Preparation	2
Spring 2007	112	General Chemistry	153
Spring 2007	399	Independent Study	1
Spring 2007	496	Undergraduate Research	1
Spring 2007	701	Seminar	5
Spring 2007	898	Research in Chemistry I	4
Spring 2007	899	Dissertation Preparation	2
Fall 2006	496	Undergraduate Research	1
Fall 2006	497	Undergraduate Research	1
Fall 2006	499	Senior Thesis	1
Fall 2006	713	Chemistry of the Elements	4
Fall 2006	790	Introduction to Research	1
Fall 2006	898	Research in Chemistry II	3
Fall 2006	899	Dissertation Preparation	1
Summer II 2006	798	Research in Chemistry I	1
Summer II 2006	898	Research in Chemistry II	5
Summer I 2006	798	Research in Chemistry I	1

Summer I 2006	799	Thesis Preparation	1
Summer I 2006	898	Research in Chemistry II	4
Spring 2006	112	General Chemistry	156
Spring 2006	390z	Project Planning	1
Spring 2006	496	Undergraduate Research	1
Spring 2006	701	Seminar	5
Spring 2006	791	Introduction to Research	2
Spring 2006	898	Research in Chemistry	3
Spring 2006	899	Dissertation Preparation	3
Fall 2005	713	Chemistry of the Elements	3
Fall 2005	790	Introduction to Research	2
Fall 2005	799	Thesis Preparation	1
Fall 2005	898	Research in Chemistry II	4
Fall 2005	899	Dissertation Preparation	2
Summer II 2005	898	Research in Chemistry II	5
Summer II 2005	899	Dissertation Preparation	1
Summer I 2005	898	Research in Chemistry II	4
Summer I 2005	899	Dissertation Preparation	1
Spring 2005	399	Undergraduate Research	1
Spring 2005	496	Undergraduate Research	1
Spring 2005	701	Seminar	12
Spring 2005	791	Introduction to Research	1
Spring 2005	798	Thesis Preparation	1
Spring 2005	898	Research in Chemistry	5
Spring 2005	899	Dissertation Preparation	1
Fall 2004	511	Adv. Inorganic Chemistry	13
Fall 2004	713	Chemistry of the Elements	9
Fall 2004	790	Introduction to Research	1
Fall 2004	898	Introduction to Research II	5
Summer II 2004	898	Research in Chemistry II	5
Summer I 2004	898	Research in Chemistry II	5
Spring 2004	112	General Chemistry	201
Spring 2004	496	Undergraduate Research	1
Spring 2004	701	Seminar	7
Spring 2004	791	Introduction to Research	3
Spring 2004	799	Thesis Preparation	1
Spring 2004	898	Research in Chemistry	4
Spring 2004	899	Dissertation Preparation	1
Fall 2003	790	Introduction to Research	3
Fall 2003	898	Research in Chemistry II	4
Fall 2003	899	Dissertation Preparation	1
Summer II 2003	898	Research in Chemistry II	6
Summer I 2003	799	Thesis Preparation	4

Summer I 2003	898	Research in Chemistry	2
Spring 2003	112	General Chemistry	139
Spring 2003	701	Seminar	7
Spring 2003	791	Introduction to Research	1
Spring 2003	799	Thesis Preparation	4
Spring 2003	898	Research in Chemistry II	2
Spring 2003	899	Dissertation Preparation	1
Fall 2002	713	Chemistry of the Elements	9
Fall 2002	790	Introduction to Research	2
Fall 2002	898	Research in Chemistry II	3
Fall 2002	899	Dissertation Preparation	1
Summer II 2002	898	Research in Chemistry	4
Summer II 2002	899	Dissertation Preparation	2
Summer I 2002	898	Research in Chemistry	4
Summer I 2002	899	Dissertation Preparation	1
Spring 2002	112	General Chemistry	123
Spring 2002	701	Seminar	6
Spring 2002	799	Thesis Preparation	2
Spring 2002	898	Research in Chemistry	1
Spring 2002	899	Dissertation Preparation	3
Fall 2001	713	Chemistry of the Elements	5
Fall 2001	U101	University 101	19
Fall 2001	898	Research in Chemistry II	3
Fall 2001	899	Dissertation Preparation	1
Summer II 2001	898	Research in Chemistry II	3
Summer II 2001	899	Dissertation Preparation	1
Summer I 2001	898	Research in Chemistry	3
Summer I 2001	899	Dissertation Preparation	1
Spring 2001	112	General Chemistry	120
Spring 2001	701	Seminar	4
Spring 2001	791	Introduction to Research	1
Spring 2001	898	Research in Chemistry II	1
Spring 2001	899	Dissertation Preparation	4
Fall 2000	713	Chemistry of the Elements	4
Fall 2000	U101	University 101	10
Fall 2000	790	Introduction to Research	1
Fall 2000	799	Thesis Preparation	1
Fall 2000	898	Research in Chemistry II	3
Fall 2000	899	Dissertation Preparation	2
Summer II 2000	898	Research in Chemistry II	1
Summer II 2000	899	Dissertation Preparation	5
Summer I 2000	898	Research in Chemistry II	2
Summer I 2000	899	Dissertation Preparation	4

Spring 2000	112	General Chemistry	175
Spring 2000	701	Seminar	8
Spring 2000	899	Dissertation Preparation	1
Spring 2000	898	Research in Chemistry II	4
Spring 2000	799	Thesis Preparation	1
Spring 2000	791	Introduction to Research	2
Fall 1999	713	Chemistry of the Elements	5
Fall 1999	U101	University 101	20
Fall 1999	790	Introduction to Research	2
Fall 1999	791	Introduction to Research	1
Fall 1999	799	Thesis Preparation	2
Fall 1999	898	Research in Chemistry II	5
Summer II 1999	798	Research in Chemistry I	1
Summer II 1999	898	Research in Chemistry II	4
Summer I 1999	798	Research in Chemistry	1
Summer I 1999	898	Research in Chemistry	4
Summer I 1999	899	Dissertation Preparation	1
Spring 1999	112	General Chemistry	103
Spring 1999	899	Dissertation Preparation	2
Spring 1999	898	Research in Chemistry II	1
Spring 1999	799	Thesis Preparation	1
Spring 1999	798	Research in Chemistry I	1
Spring 1999	791	Introduction to Research	1
Spring 1999	790	Introduction to Research	1
Fall 1998	713	Chemistry of the Elements	12
Fall 1998	U101	University 101	17
Fall 1998	790	Introduction to Research	1
Fall 1998	799	Thesis Preparation	1
Fall 1998	898	Research in Chemistry II	1
Fall 1998	899	Dissertation Preparation	2
Fall 1998	399	Independent Research	1
Summer II 1998	798	Research in Chemistry I	2
Summer II 1998	898	Research in Chemistry II	2
Summer II 1998	497	Undergraduate Research	1
Summer I 1998	798	Research in Chemistry I	2
Summer I 1998	898	Research in Chemistry II	2
Summer I 1998	496	Undergraduate Research	1
Spring 1998	112	Freshman Chemistry	106
Spring 1998	498	Undergraduate Research	1
Spring 1998	791	Introduction to Research	2
Spring 1998	799	Thesis Preparation	1
Spring 1998	898	Research in Chemistry II	2
Spring 1998	701	Inorganic Seminar	8

Fall 1997	713	Chemistry of the Elements	9
Fall 1997	U101	University 101	20
Fall 1997	790	Introduction to Research	2
Fall 1997	898	Research in Chemistry II	2
Fall 1997	498	Undergraduate Research	1
Summer II 1997	799	Thesis Preparation	2
Summer I 1997	799	Thesis Preparation	2
Summer I 1997	496	Undergraduate Research	1
Spring 1997	799	Thesis Preparation	2
Spring 1997	898	Research in Chemistry II	1
Spring 1997	899	Dissertation Preparation	2
Fall 1996	713	Chemistry of the Elements	10

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<u>Semester/Quarter</u>	<u>Course Number</u>	<u>Course Description</u>	<u>Number of Students</u>
Spring 1996	5.05	Solid State Chemistry	15
Fall 1995	5.311	Introductory Chemical Experimentation	56
Spring 1995	5.05	Solid State Chemistry	12
Fall 1994	5.311	Introductory Chemical Experimentation	56
Spring 1994	5.05	Solid State Chemistry	24
Fall 1993	5A04	Chemistry and the Environment	8
Fall 1993	5.04	Group Theory	45
Spring 1993	5.03	Principles of Inorganic Chemistry	57
Fall 1992	5A04	Chemistry and the Environment	8
Fall 1992	5.04	Group Theory	35
Spring 1992	5.03	Principles of Inorganic Chemistry	53
Fall 1991	5A04	Chemistry and the Environment	8
Fall 1991	5.04	Group Theory	30
Spring 1991	5.03	Principles of Inorganic Chemistry	41
Fall 1990	5A04	Chemistry and the Environment	8
Fall 1990	5.04	Group Theory	32
Spring 1990	5.03	Principles of Inorganic Chemistry	35

5A04 is a freshman advising seminar course that meets for a two hour seminar each week and includes advising 8 freshman during their entire first year at MIT