

Curriculum Vitae -- Christopher L. Exstrom

University of Nebraska at Kearney
Department of Chemistry
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EDUCATION:

University of Minnesota, Ph.D., 1995, Chemistry (Interdisciplinary: Inorganic/Analytical/Physical)
Illinois Wesleyan University, B.A., 1990, Chemistry (*magna cum laude*, department honors)

PROFESSIONAL EMPLOYMENT:

University of Nebraska at Kearney (UNK), Professor of Chemistry, 2006-present
University of Nebraska at Kearney (UNK), Ron & Carol Cope Professor of Chemistry, 2016-2021
University of Nebraska at Kearney (UNK), Associate Professor of Chemistry, 2000-2006
University of Nebraska at Kearney, Assistant Professor of Chemistry, 1996-2000
Kenyon College, Visiting Assistant Professor of Chemistry, 1995-1996

ADMINISTRATIVE APPOINTMENTS

UNK Chemistry Department Chair (2000-2006): Created a chemistry research apprentice program for 2nd-semester freshmen; Orchestrated joint Biochemistry/Molecular Biology facilities collaborations for NU system Programs of Excellence funding; Planned space re-design and directing department activities during major renovation

UNK Online Science/Math Education M.S.Ed. Program Director (2012-2019): Reorganized administrative structure to be a cross-disciplinary program that reports directly to the Dean of Graduate Studies; The program has expanded participation from five academic departments and enrollment increased by 259% during this time.

ADDITIONAL APPOINTMENT

Affiliated Faculty, Department of Electrical Engineering, University of Nebraska-Lincoln, 2007-present

AWARDS:

UNK Pratt-Heins Award for Excellence in Service, 2018.
UNK Ron & Carol Cope Professorship, 2016
UNK Leland Holdt/Security Mutual Life Insurance Company Distinguished Faculty Award, 2010
UNK Pratt-Heins Award for Excellence in Research and Scholarship, 2006.
UNK Undergraduate Research Faculty Mentor of the Year, Natural Sciences, 2006

TEACHING & UNK HIGHLIGHTS

Have taught 12 different courses in Introductory, General, Analytical, Environmental, Inorganic Chemistry & Seminar
Developed four online courses for high school teachers in inorganic, environmental chemistry & chemical safety
UNK Chemistry Department has 11 faculty and is ACS-accredited with strong records in teaching and undergraduate research; graduates have been accepted into Ph.D. programs at Cal Tech, Cal-Berkeley, Illinois, Texas A&M, Wisconsin, Minnesota

RESEARCH INTERESTS & HIGHLIGHTS

Interests: Non-vacuum preparation methods of semiconductor and noble metal nanocrystalline materials for solar cell and sensor electronics applications; Micro/nano structural characterization of laser-treated metal surfaces
PI or co-PI for \$3,790,000 in external funding (DOE, NSF, Nebraska Research Initiative Program)
29 refereed journal and proceedings articles, 7 patents/applications, numerous faculty and student conference presentations
Mentored 83 undergraduate research students since 1996

SERVICE HIGHLIGHTS

Developed online training curriculum for Keep Nebraska Beautiful and the EPA School Chemical Cleanout Campaign
EPA Cleburn Street Superfund site (Grand Island, NE) maintenance project director (2000-2002, \$229,854 external funding)
UNK Graduate Council, Chair of Graduate Academic Policy Committee, UNK Faculty Senator, Chair of Academic Freedom & Tenure committee, Chair of College of Natural & Social Sciences (CNSS) Advisory Committee, Member of CNSS Rank & Tenure Committee
University system-wide committees – NU Department Teaching Award selection, NU Innovation, Enhancement & Development Award selection, Nebraska EPSCoR First Award Grant Pre-proposal evaluation, NU Original Research & Creative Activity Award selection

PROFESSIONAL SOCIETY & CENTER MEMBERSHIPS:

Faculty Associate, Nebraska Center for Materials & Nanoscience, 2007-present

Faculty Associate, Univ. of Nebraska-Lincoln Center for Nanohybrid Functional Materials, 2010-present

Active Memberships: American Chemical Society, Phi Kappa Phi, Materials Research Society, Sigma Xi, IEEE

Scholarly Publications (all articles are in refereed journals – undergraduate co-authors denoted by *)

1. "Spectroscopy and Photophysics of $\text{Rh}_2(\text{dimen})_4^{2+}$ (dimen = 1,8-Diisocyanomenthane). Exceptional Metal-Metal Bond Shortening in the Lowest Electronic Excited States." Miskowski, V. M.; Rice, S. F.; Gray, H. B.; Dallinger, R. F.; Milder, S. J.; Hill, M. G.; Exstrom, C. L.; Mann, K. R. *Inorganic Chemistry*, **1994**, *33*, 2799-2807.
2. "Inclusion of Organic Vapors by Crystalline, Solvatochromic $[\text{Pt}(\text{arylisonitrile})_4][\text{Pd}(\text{CN})_4]$ Compounds. 'Vapochromic' Environmental Sensors." Exstrom, C. L.; Sowa, J. R., Jr.; Daws, C. A.; Janzen, D.; Mann, K. R.; Stewart, F. F.; Moore, G. A. *Chemistry of Materials*, **1995**, *7*, 15-17.
3. "X-ray Structural Characterization of $\text{Rh}_2(\text{dimen})_4^{2+}$ and $\text{Ir}_2(\text{dimen})_4^{2+}$ (dimen = 1,8-Diisocyno-menthane) Crystals with an Exceptionally Wide Range of Metal-Metal Distances and Dihedral Twist Angles" Exstrom, C. L.; Mann, K. R.; Hill, M. G.; Miskowski, V. M.; Schaefer, W. P.; Gray, H. B.; Lammana, W. H. *Inorganic Chemistry* **1996**, *35*, 549-550.
4. "'Vapochromic' Compounds as Environmental Sensors. 2. Synthetis, Near-Infrared and Infrared Spectroscopy Studies of $[\text{Pt}(\text{arylisonitrile})_4][\text{Pt}(\text{CN})_4]$ Upon Exposure to Volatile Organic Compound Vapors" Daws, C. A.; Exstrom, C. L.; Sowa, J. R., Jr.; Mann, K. R. *Chemistry of Materials*, **1997**, *9*, 363-368.
5. "A Vapochromic LED" Kunugi, Y.; Mann, K. R.; Miller, L. L.; Exstrom C. L. *Journal of the American Chemical Society*, **1998**, *120*, 589-590.
6. "Infrared Spectroscopy Studies of Platinum Salts Containing Tetracyanoplatinate(II). Evidence for Strong Hydrogen-Bonding Interactions in 'Vapochromic' Environmental Sensor Materials" Exstrom, C. L.; Pomije, M. K.; Mann, K. R. *Chemistry of Materials*, **1998**, *10*, 942-945.
7. "A Novel Chemistry Camp Format as an Outreach Model for Regional Colleges and Universities" Exstrom, C. L.; Mosher, M. D. *Journal of Chemical Education*, **2000**, *77*, 1295-1297.
8. "Optical and Electronic Characterization of a-SiGe:H Thin Films Prepared by a Novel Hollow Cathode Deposition Technique" Soukup, R.J., Ianno, N.J., Darveau, S.A., Exstrom, C.L., *Materials Research Society Symposium Proceedings*, **2004**, *808*, A9.4.1.
9. "Thin Films of a-SiGe:H With Device Quality Properties Prepared By a Novel Hollow Cathode Deposition Technique" Soukup, R.J., Ianno, N.J., Darveau, S.A., Exstrom, C.L., *Solar Energy Materials and Solar Cells*, **2005**, *87*, 87-98.
10. "Thin Films of GeC Deposited Using a Unique Hollow Cathode Sputtering Technique" R.J. Soukup, N.J. Ianno, J.S. Schrader, C.L. Exstrom, S.A. Darveau, R.N. Udey, V.L. Dalal, *Solar Energy Materials and Solar Cells*, **2006**, *90*, 2338-2345.
11. "Copper-Indium-Boron-Diselenide Absorber Materials" Ianno, N.J., Soukup, R.J., Santero, T., Kamler, C., Huguenin-Love, J., Darveau, S.A., Olejníček, J., Exstrom, C.L., *Materials Research Society Symposium Proceedings*, **2007**, *1012*, Y03-21.
12. "Thin Films Formed by Selenization of $\text{CuIn}_x\text{B}_{1-x}$ Precursors in Se Vapor" Kamler, C.; Soukup, R.J.; Ianno, N. J.; Huguenin-Love, J.; Olejníček, J.; Darveau, S.A.; Exstrom, C.L., *Solar Energy Materials and Solar Cells*, **2009**, *93*, 45-50.
13. "Problems with Synthesis of Chalcopyrite $\text{CuIn}_{1-x}\text{B}_x\text{Se}_2$ " Olejníček, J.; Darveau, S.A.; Exstrom, C.L.; Soukup, R.J.; Ianno, N.J.; Kamler, C.A.; Huguenin-Love, J.L., *Materials Science Forum*, **2009**, *609*, 33-36.
14. "Solvothermal Preparation, Processing, and Characterization of Nanocrystalline $\text{CuIn}_{1-x}\text{Al}_x\text{Se}_2$ Materials" Exstrom, C.L.; Olejníček, J.; Darveau, S.A.; Mirasano, A.*; Paprocki, D.S.*; Schliefert, M.L.*; Ingersoll, M.A.*; Slaymaker, L.E.*; Soukup, R.J.; Ianno, N.J.; Kamler, C.A., *Materials Research Society Symposium Proceedings*, **2009**, *1165*, M05-03.

15. "A Non-vacuum Process for Preparing Nanocrystalline $\text{CuIn}_{1-x}\text{Ga}_x\text{Se}_2$ Materials Involving an Open-air Solvothermal Reaction" Olejníček, J.; Kamler, C.A.; Mirasano, A.*; Martinez-Skinner, A.*; Ingersoll, M.*; Exstrom, C.L.; Darveau, S.A.; Huguenin-Love, J.; Diaz, M.; Ianno, N.J.; Soukup, R.J. *Solar Energy Materials and Solar Cells*, **2010**, *94*, 8-11.
16. "Formation of $\text{CuIn}_{1-x}\text{Al}_x\text{Se}_2$ Thin Films Studied by Raman Scattering," Olejníček, J.; Kamler, C.A.; Darveau, S.A.; Exstrom, C.L.; Slaymaker, L.E.*; Vandeventer, A.R.*; Ianno, N.J.; Soukup, R.J. *Thin Solid Films*, **2011**, *519*, 5329-5334.
17. "Properties of $\text{CuIn}_{1-x}\text{Ga}_x\text{Se}_2$ Films Prepared by the Rapid Thermal Annealing of Spray-deposited $\text{CuIn}_{1-x}\text{Ga}_x\text{S}_2$ and Se," Slaymaker, L.E.*; Hoffman, N.M.*; Ingersoll, M.A.*; Jensen, M.R.*; Olejníček, J.; Exstrom, C.L.; Darveau, S.A.; Soukup, R.J.; Ianno, N.J.; Sarkar, A.; Kment, Š., *Materials Research Society Symposium Proceedings*, **2011**, *1324*, DOI: 10.1557/opl.2011.1152.
18. "Thermoelectric Properties of p-type CuInSe_2 Chalcopyrites Enhanced by Introduction of Manganese," Yao, J.; Takas, N.J.; Schliefert, M.L.*; Paprocki, D.S.*; Blanchard, P.E.R.; Mar, A.; Exstrom, C.L.; Darveau, S.A.; Poudeu, P.F.P.; Aitken, J.A., *Physical Review B*, **2011**, *84*, 075203.
19. " $\text{CuIn}_{1-x}\text{Al}_x\text{S}_2$ Thin Films Prepared by Sulfurization of Metallic Precursors," Olejníček, J.; Slaymaker, L.E.*; Darveau, S.A.; Exstrom, C.L.; Kment, Š.; Prabukanthan, P.; Ianno, N.J.; Soukup, R.J. *Journal of Alloys and Compounds*, **2011**, *509*, 10020-10024.
20. "Air Stable, Photosensitive, Phase Pure Iron Pyrite Nanocrystal Thin Films for Photovoltaic Application," Bu, Y.; Yuan, Y.; Exstrom, C.L.; Darveau, S.A.; Huang, J., *Nano Letters*, **2011**, *11*, 4953-4957.
21. "M-M Bond-Stretching Energy Landscapes for $\text{M}_2(\text{dimen})_4^{2+}$ (M = Rh, Ir; dimen = 1.8-dissocyanomethane) Complexes," Hunter, B.M.; Villahermosa, R.M.; Exstrom, C.L.; Hill, M.G.; Mann, K.R.; Gray, H.B., *Inorganic Chemistry*, **2012**, *51*, 6898-6905.
22. "Zinc Alloyed Iron Pyrite Nanocrystals for Band Gap Broadening," Mao, B.; Dong, Q.; Xiao, Z.; Exstrom, C.L.; Darveau, S.A.; Webber, T.E.*; Lund, B.D.*; Huang, H.; Kang, Z.; Huang, J., *Journal of Materials Chemistry A*, **2013**, *1*, 12060-12065.
23. "Preparation of CIGS Thin Films by HiPIMS or DC Sputtering and Various Selenization Processes," Olejníček, J.; Hubička, Z.; Kšířová, P.; Kment, Š.; Brunclíková, M.; Kohout, M.; Čada, M.; Darveau, S.A.; Exstrom, C.L., *Journal of Advanced Oxidation Technologies*, **2013**, *16*, 314-319.
24. "Surface Thermal Stability of Iron Pyrite Nanocrystals: Role of Capping Ligands," Mao, B.; Dong, Q.; Exstrom, C.L.; Huang, J., *Thin Solid Films*, **2014**, *562*, 361-366.
25. "A Low-temperature Fabrication Method for WSe_2 Films Grown from Nanocrystalline Precursors," Exstrom, C.L.; Darveau, S.A.; Edgar, J.S.*; Curry, C.J.*; Hanrahan, M.P.*; Ma, Q.; Hilfiker, M.; Ediger, A.; Ianno, N.J. *MRS Advances*, **2016**, *1*, 2821-2826.
26. "Non-vacuum Preparation of WSe_2 Thin Films via the Selenization of Hydrated Tungsten Oxide Prepared using Chemical Solution Methods," Exstrom, C.L.; Darveau, S.A.; Falconer, M.E.*; Blum, J.R.*; Colling, W.M.*; Ianno, N.J. *MRS Advances*, **2018**, *3*, 3281-3286.
27. "Hydration, Strength, and Durability of Cementitious Materials Incorporating Untreated Corn Cob Ash," Shakouri, M.; Exstrom, Christopher L.; Ramanathan, S.; Suraneni, P. *Construction & Building Materials*, **2020**, *243*, 118171.
28. "Pretreatment of Corn Stover Ash to Improve its Effectiveness as a Supplementary Cementitious Material in Concrete," Shakouri, M.; Exstrom, Christopher L.; Ramanathan, S.; Suraneni, P.; Vaux, J.S. *Cement & Concrete Composites*, **2020**, *112*, 103658.
29. "Chloride Binding and Desorption Properties of the Concrete Containing Corn Stover Ash," Shakouri, M.; Exstrom, C.L.; Piccini, G.D.* *Journal of Sustainable Cement-Based Materials*, **2021**, doi: 10.1080/21650373.2021.1880982.

Patents

1. U.S. Patent No. 5,766,952 "Vapochromic Platinum-Complexes and Salts" Mann, K. R.; Daws, C. A.; Exstrom, C. L.; Janzen, D. E.; Pomije, M. K, 1998.
2. U.S. Patent No. 6,160,267 "A Vapochromic LED" Kunugi, Y.; Mann, K. R.; Miller, L. L.; Exstrom C. L., 2000.
3. U.S. Patent No. 6,338,977 "A Vapochromic LED" Kunugi, Y.; Mann, K. R.; Miller, L. L.; Exstrom C. L., 2002.
4. U.S. Patent No. 6,578,406 "A Vapochromic LED" Kunugi, Y.; Mann, K. R.; Miller, L. L.; Exstrom C. L., 2003.
5. U.S. Provisional Patent, "Facile Preparation of Nanocrystalline Multinary Chalcopyrite Materials," Exstrom, C.L.; Darveau, S.A., filed October 2009.
6. U.S. Provisional Patent Application No. 62,076,621, "Non-vacuum Method for Preparing Thin-film Tungsten Selenide Involving a Mild-temperature Solvothermal Process," Exstrom, C.L.; Darveau, S.A.; Hanrahan, M.P.; Edgar, J.S., filed November 7, 2014.
7. U.S. Patent No. 10,680,125 "Synthesis of Air-stable Pyrite Nanocrystals for Photovoltaic Application," Huang, J.; Mao, B.; Exstrom, C.L., June 9, 2020.

Scholarly and Invited Presentations (undergraduate co-authors denoted by *)

1. "The Chemistry and Spectroscopy of Some Proposed Environmental Sensor Materials" Exstrom, C. L.; Lee, D.* J.; Johnson, D.* *Proceedings of the UN System Undergraduate Research in Chemistry Symposium*, Kearney, NE, October 18, 1996.
2. "Substituent Effects on the Degree of Solvatochromism of Charge-Transfer-to-Diimine Complexes" Exstrom, C. L.; Johansen, A. N.* *32nd Midwest Regional Meeting of the American Chemical Society*, Osage Beach, MO, October 30, 1997.
3. "Chemistry of Novel Indicator Compounds", *UNK Research & Creative Activity Symposium*, March 9, 1998.
4. "Interligand Charge-Transfer Solvatochromism", invited seminar, Department of Chemistry, University of South Dakota, Vermillion, SD, September 29, 1998.
5. "Preparation and Properties of Novel Binuclear Palladium(II) Complexes and Bridging Ligand Effects on Charge-Transfer Solvatochromism" Exstrom, C. L.; Garnett, K. A.*; Fagot, B. L.*; Sinani, D.* *33rd Midwest Regional Meeting of the American Chemical Society*, Wichita, KS, November 5, 1998.
6. "Development of a Summer High School Chemistry Camp as an Outreach Model for College and Universities" Exstrom, C. L.; Mosher, M. D. *35th Midwest Regional Meeting of the American Chemical Society*, St. Louis, MO, October 27, 2000.
7. "Calibrated Peer Review in the Chemistry Laboratory" Mosher, M. D.; Exstrom, C. L.; Clark, R. D. *35th Midwest Regional Meeting of the American Chemical Society*, October 27, 2000.
8. "Applications of Preferential Solvation Concepts in Multiple Undergraduate Chemistry Courses" Exstrom, C. L. *36th Midwest Regional Meeting of the American Chemical Society*, Lincoln, NE, October 12, 2001.
9. "Study of the Preferential Solvation of Transition Metal Complexes by ¹H NMR" Mosher, M. D.; Haeberle, A. J.*; Exstrom, C. L. *37th Midwest Regional Meeting of the American Chemical Society*, Lawrence, KS, October, 2002.
10. "Spectroscopic and Ellipsometric Characterization of Amorphous Silicon Germanium Hydride Thin Films Prepared by a Novel Hollow-Cathode Method" Darveau, S.A.; Exstrom, C.L.; Soukup, R.J.; Ianno, N.J.; Okuno, K.*; Ota, N.*; Laue, C.*; Fitch, A.*; Puppula, N.S.P.; Ramakrishnan, V.; Shicheng, D.H. *38th Midwest Regional Meeting of the American Chemical Society*, Columbia, MO, November, 2003.

11. "MLCT Solvatochromism of Molybdenum-Diimine-Tetracarbonyl Complexes as a Probe for Solvent-Solvent Interactions in Solution Mixtures" Exstrom, C.L.; Smith, J.R.*; Okuno, K.* *38th Midwest Regional Meeting of the American Chemical Society*, Columbia, MO, November, 2003.
12. "Uncovered Vapochromic Properties of Common Fe(diimine)₂(CN)₂ Complexes" Exstrom, C.L.; Garretson, C.A.*; Miller, B.D.* *37th Great Lakes Regional Meeting of the American Chemical Society*, Milwaukee, WI, May 31-June 2, 2006.
13. "Fabrication and Characterization of New Photovoltaic Materials: CuBS₂ (CBS) and CuIn_xB_{1-x}Se₂ (CIBS)" Darveau, S.A.; Olejnicek, J.; Exstrom, C.L.; Ianno, N.J.; Santero, T.; Soukup, R.J. *233rd National Meeting of the American Chemical Society*, Chicago, IL, March 26, 2007.
14. "Chemical Bath Deposition of Bismuth Oxychloride. An Experimental Introduction to Thin-Film Materials at the Undergraduate and High-School Levels" Exstrom, C.L.; Lahners, J. *233rd National Meeting of the American Chemical Society*, Chicago, IL, March 29, 2007.
15. "Cu_xB_{1-x}Se₂ Absorber Materials" Ianno, N.J.; Santero, T.; Soukup, R.J.; Exstrom, C.L.; Olejnicek, J.; Darveau, S.A. *Materials Research Society Symposium*, San Francisco, CA, April 9-13, 2007.
16. "Variation in the Indium-Gallium Stoichiometry in the Solvothermal Preparation of CuIn_{1-x}Ga_xSe₂ Nanocrystalline Materials" Martinez-Skinner, A.L.*; Ingersoll, M.A.*; Olejnicek, J.; Mirasano, A.*; Haussler, A.T.*; Exstrom, C.L.; Darveau, S.A.; Huguenin-Love, J.; Kamler, C.; Ianno, N.J.; Soukup, R.J. *42nd Midwest Regional Meeting of the American Chemical Society*, Kansas City, MO, November 7-9, 2007.
17. "Reaction Pathway Insights into the Solvothermal Preparation of CuIn_{1-x}Ga_xSe₂ Nanocrystalline Materials" Exstrom, C.L.; Darveau, S.A.; Martinez-Skinner, A.L.*; Ingersoll, M.A.*; Olejnicek, J.; Mirasano, A.*; Haussler, A.T.*; Huguenin-Love, J.; Kamler, C.; Diaz, M.; Ianno, N.J.; Soukup, R.J. *33rd IEEE Photovoltaics Specialists Conference*, San Diego, CA, May 11-16, 2008.
18. "Incorporation of Aluminum and Boron into CuInSe₂ Chalcopyrite Structures: Preparation and Characterization of the First nanocrystalline CuIn_{1-x}M_xSe₂ (M = Al, B) Materials" Exstrom, C.L.; Darveau, S.A.; Olejnicek, J.; Schliefer, M.L.*; Paprocki, D.S.*; Vandeventer, A.R.*; Mirasano, A.*; Soukup, R.J.; Ianno, N.J.; Kamler, C.A. *43rd Midwest Regional Meeting of the American Chemical Society*, Kearney, NE, October 10, 2008.
19. "Solvothermal Preparation, Processing, and Characterization of Nanocrystalline CuIn_{1-x}Al_xSe₂ Materials" Exstrom, C.L.; Olejnicek, J.; Darveau, S.A.; Mirasano, A.*; Paprocki, D.S.*; Schliefer, M.L.*; Ingersoll, M.A.*; Slaymaker, L.E.*; Soukup, R.J.; Ianno, N.J.; Kamler, C.A. *Materials Research Society Symposium*, San Francisco, CA, April 13-17, 2009.
20. "Raman Spectroscopy Studies of CuIn_{1-x}Al_xSe₂ Thin Film Growth" Olejnicek, J.; Exstrom, C.L.; Darveau, S.A.; Vandeventer, A.R.*; Slaymaker, L.E.*; Ianno, N.J.; Soukup, R.J. *238th National Meeting of the American Chemical Society*, Washington, DC, August 16-20, 2009.
21. "Low-temperature Aqueous Solution-based Routes for the Preparation of Chalcopyrite Solar Cell Absorber Materials," Exstrom, C.L.; Darveau, S.A.; Ingersoll, M.A.*; Jensen, M.R.*; Cook, C.*; Slaymaker, L.E.*; Vandeventer, A.R.*; Soukup, R.J.; Ianno, N.J. *44th Midwest Regional Meeting of the American Chemical Society*, Iowa City, IA, October 23, 2009.
22. "Room Temperature Non-vacuum Preparation of Nanocrystalline CuInSe₂ Employing Aqueous Solvents," Exstrom, C.L.; Darveau, S.A.; Ingersoll, M.A.*; Jensen, M.R.*; Cook, C.*; Slaymaker, L.E.*; Soukup, R.J.; Ianno, N.J., *35th IEEE Photovoltaics Specialists Conference*, Honolulu, HI, June 20-25, 2010.
23. "Solvothermal Preparation of Nanocrystalline Pyrite FeS₂ and its Outlook as a Third-generation Solar Cell Absorber Material," Exstrom, C.L.; Darveau, S.A.; Webber, T.E.*; Neville, C.; Slaymaker, L.E.*; Olejnicek, J.; Huang, J.; Bi, Y.; Soukup, R.J.; Ianno, N.J.; Amitabha, S., *45th Midwest Regional Meeting of the American Chemical Society*, Wichita, KS, October 28, 2010.
24. "Solvothermal Preparation of Nanocrystalline SnS₂ via Hot-Injection and Thermal Decomposition Methods," Exstrom, C.L.; Darveau, S.A.; Webber, T.E.*; Jensen, M.R.*; Ingersoll, M.A.*; Neville, C.; Soukup, R.J.; Ianno, N.J.; Amitabha, S., *242nd National Meeting of the American Chemical Society*, Denver, CO, August 28-29, 2011.

25. "Earth-Abundant Sulfides as Nanocrystal-based Solar Cell Materials," invited seminar, Duquesne University, Pittsburgh, PA, March 30, 2012.
26. "Preparation and Studies of Gold Nanoparticles Prepared *via* Oxalate Reduction of H₂AuCl₄," Exstrom, C.L.; Darveau, S.A. invited seminar, University of Nebraska-Lincoln, Lincoln, NE, November 1, 2013.
27. "Halide Ion Influence on the Pathway of Reductive Gold Nanoparticle Formation in Aqueous Solution," Exstrom, C.L.; Lueck, B.A.*; Clark, S.L.; Gydesen, T.V.; Neville, C.R.; Darveau, S.A. *48th Midwest Regional Meeting of the American Chemical Society*, Springfield, MO, October 16-18, 2013.
28. "A Low-temperature Fabrication Method for WSe₂ Films Grown from Nanocrystalline Precursors," Exstrom, C.L.; Darveau, S.A.; Edgar, J.S.*; Curry, C.J.*; Hanrahan, M.P.*; Ma, Q.; Hilfiker, M.; Ediger, A.; Ianno, N.J. *Materials Research Society Symposium*, Phoenix, AZ, March 28-31, 2016.
29. "Solution-based Syntheses of Semiconductor Nanoparticles and Conversion to Thin-film Materials with Next-generation Heterojunction Photovoltaic Device Applications," Exstrom, C.L.; Darveau, S.A. *51st Midwest Regional Meeting of the American Chemical Society*, Manhattan, KS, October 26, 2016. **(Invited Symposium Speaker)**
30. "Embedding Silica Aerogels into Femtosecond Laser Surface Processed (FLSP) Aluminum as a Means to Control Wettability Properties," Darveau, S.A.; Exstrom, C.L.; Tanbouza-Husseini, A.*; Everitt, K.R.*; Breemes, M.K.*; Peng, E.; Shield, J.E.; Gogos, G.; Bell, R.; Zuhlke, C.A.; Alexander, D.R., *Materials Research Society Symposium*, Phoenix, AZ, April 3-6, 2018.
31. "Non-vacuum Preparation of WSe₂ thin films *via* the Selenization of Hydrated Tungsten Oxide Prepared using a Chemical Bath Method," Exstrom, C.L.; Darveau, S.A.; Falconer, M.E.*; Blum, J.R.*; Colling, W.M.*; Ianno, N.J., *Materials Research Society Symposium*, Phoenix, AZ, April 3-6, 2018.
32. "Preferential solvation thermodynamics explored through UV-vis spectrophotometry of Mo(phenanthroline)(CO)₄ in mixed solvents as part of a new integrated upper-level undergraduate chemistry laboratory course," Exstrom, C.L.; Darveau, S.A., *54th Midwest Regional Meeting of the American Chemical Society*, Wichita, KS, October 16-18, 2019.

Student and co-Authored Presentations (undergraduate authors denoted by *)

1. "Reactions of PdCl₂ with Dipyridyltetrzine Ligands" Lee, D. J. *; Exstrom, C. L. *Argonne Symposium of Undergraduate Research*, Argonne, IL, Spring, 1997
2. "Preparation and Acid-Base Chemistry of Novel Acridine-Containing Polymers." Polk, M. A. *; Exstrom, C. L.; Major, J. S. *; Mosher, M. D. *32nd Midwest Regional Meeting of the American Chemical Society*, Osage Beach, MO, October 30, 1997.
3. "Synthesis and Properties of Nickel Charge-Transfer-to-Diimine Complexes" Fagot, B. L. *; Exstrom, C. L. *UNK Research & Creative Activity Symposium*, March 9, 1998.
4. "Acid-Base Chemistry of Acridine Derivatives" Polk, M. A. *; Exstrom, C. L. *UNK Research & Creative Activity Symposium*, March 10, 1998.
5. "Chemistry of Copper Charge-Transfer-to-Diimine Complexes" Sinani, D. *; Exstrom, C. L. *UNK Research & Creative Activity Symposium*, March 10, 1998.
6. "Preparation and Spectroscopic Properties of Novel Diimine Nickel(II) Catecholate Complexes." Fagot, B. L. *; Exstrom, C. L. *33rd Midwest Regional American Chemical Society*, Wichita, KS, November 5, 1998.
7. "Diimine Structural Effects on the Spectroscopic Properties of Copper(II) Diimine Catecholate Complexes." Sinani, D. *; Exstrom, C. L. *33rd Midwest Regional American Chemical Society*, Wichita, KS, November 5, 1998.
8. "Acid-Base Chemistry of Novel Nitrophenylhydrazine Derivatives." Polk, M. A. *; Bolling, S. M. *; Exstrom, C. L. *33rd Midwest Regional American Chemical Society*, Wichita, KS, November 5, 1998.

9. "Pi-donor Substituent Effects on the Solvatochromic Shifts of Palladium(II) Charge-Transfer-to-Diimine Complexes." Holmes, K. L.*; Weber, G. A.*; Exstrom, C. L. *33rd Midwest Regional American Chemical Society*, Wichita, KS, November 5, 1998.
10. "Preparation and Solution Properties of Nickel Complexion Pairs" Fagot, B. L.*; Exstrom, C. L. *14th National Conference on Undergraduate Research*, Missoula, MT, April 28, 2000.
11. "Diimine Substituent Effects on the Solvatochromic Shifts of Palladium(II) Charge-Transfer-to-Diimine Complexes" Weber, G. A.*; Holmes, K. L.*; Exstrom, C. L. *14th National Conference on Undergraduate Research*, Missoula, MT, April 28, 2000.
12. "Preparation And Solvation Studies On Cadmium(II) Diimine Catecholate And Dithiolate Complexes", Exstrom, C. L.; Leonard, B.* *36th Midwest Regional Meeting of the American Chemical Society*, Lincoln, NE, October 12, 2001.
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14. "Analyses of Iron Content in the Platte River Water Using Ultraviolet-Visible Spectroscopy and Atomic Absorption", Exstrom, C. L.; Darville, L.* *17th National Conference on Undergraduate Research*, Salt Lake City, UT, March 15, 2003.
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17. "Synthesis and Characterization of Novel Binuclear Molybdenum-diimine-diphosphine Complexes. The First Step Toward Solvatochromic "Molecular Grid" Materials", Larson, P.T.*; Exstrom, C.L. *40th Midwest Regional Meeting of the American Chemical Society*, Joplin, MO, October 27, 2005, and the *20th National Conference on Undergraduate Research*, Asheville, NC, April 6, 2006.
18. "Preparation, Characterization, and Vapochromic Properties of the novel Fe(4,4'-di-t-butyl-2,2'-bipyridine)₂(CN)₂ Complex", Garretson, C.A.*; Miller, B.D.*; Exstrom, C.L. *40th Midwest Regional Meeting of the American Chemical Society*, Joplin, MO, October 27, 2005.
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20. "Characterization of Thin-Film GeC Fabricated by a Hollow-Cathode Plasma-Jet Deposition Method", Udey, R.N.*; Exstrom, C.L.; Darveau, S.A.; Soukup, R.J.; Ianno, N.J.; *40th Midwest Regional Meeting of the American Chemical Society*, Joplin, MO, October 27, 2005, and the *20th National Conference on Undergraduate Research*, Asheville, NC, April 6, 2006.
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29. "Reaction Pathway Investigations of the Solvothermal Preparation of Nanocrystalline CuInSe_2 in Chelating Amine Solvents: Effects of Added Salts and Solvent Coordinating Ability", Paprocki, D.S.*; Martinez-Skinner, A.L.*; Ingersoll, M.A.*; Olejnicek, J.; Vandeventer, A.R.*; Mirasano, A.*; Haussler, A.T.*; Exstrom, C.L.; Darveau, S.A.; Huguenin-Love, J.L.; Kamler, C.A.; Diaz, M.; Ianno, N.J.; Soukup, R.J. *43rd Midwest Regional Meeting of the American Chemical Society*, Kearney, NE, October 8-10, 2008.
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32. "Self-organized Nanostructures of Vapor-phase Grown CuGaS_2 Thin Films", P. Prabukanthan, G. Harichandran, R.J. Soukup, N.J. Ianno, C.L. Exstrom, S.A. Darveau, J. Olejníček, *34th IEEE Photovoltaics Specialists Conference*, Philadelphia, PA, June 8-11, 2009.
33. "Formation of $\text{CuIn}_{1-x}\text{Al}_x\text{Se}_2$ Thin Films Studied by Raman Scattering", J. Olejníček, C.A. Kamler, C.L. Exstrom, S.A. Darveau, N.J. Ianno, R.J. Soukup, *216th Meeting of the Electrochemical Society*, Vienna, Austria, October 4-9, 2009.
34. "Thin Films of $\text{CuIn}_x\text{B}_{1-x}\text{Se}_2$ as Absorbers for CIBS Solar Cells", R. J. Soukup, N. J. Ianno, C. A. Kamler, J. Olejníček, S. A. Darveau, and C. L. Exstrom, *216th Meeting of the Electrochemical Society*, Vienna, Austria, October 4-9, 2009.
35. "Preparation and Studies of Nanocrystalline CuInSe_2 Materials Prepared from Aqueous Solution at Room Temperature," Ingersoll, M.A.*; Jensen, M.R.*; Cook, C.*; Slaymaker, L.E.*; Vandeventer, A.R.*; Exstrom, C.L.; Darveau, S.A.; Soukup, R.J.; Ianno, N.J., *44th Midwest Regional Meeting of the American Chemical Society*, Iowa City, IA, October 21-23, 2009.
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39. "Use of Sodium Thiosulfate in the Water Solution-based Preparation of Copper Indium Disulfide," Cook, C.*; Ingersoll, M.A.*; Jensen, M.R.*; Slymaker, L.E.*; Vandeventer, A.R.*; Exstrom, C.L.; Darveau, S.A.; Soukup, R.J.; Ianno, N.J., *44th Midwest Regional Meeting of the American Chemical Society*, Iowa City, IA, October 21-23, 2009.
40. "A Novel Method for Synthesis of SnS and SnS_2 Thin Films as Potential Heterjunction Partners for FeS_2 Solar Cells," Sarkar, A.; Soukup, R.J.; Ianno, N.J.; Kamler, C.A.; Exstrom, C.L.; Darveau, S.A.; Olejníček, J., *35th IEEE Photovoltaics Specialists Conference*, Honolulu, HI, June 20-25, 2010.
41. "Raman Spectroscopy of $\text{Cu}(\text{In},\text{Al})\text{S}_2$ Thin Films Prepared by Sulfurization of Metallic Precursors," Olejníček, J.; Darveau, S.A.; Exstrom, C.L.; Slymaker, L.E.*; Kment, Š.; Soukup, R.J.; Ianno, N.J., *Nebraska Research & Innovation Conference*, Lincoln, NE, October 5, 2010 and *45th Midwest Regional Meeting of the American Chemical Society*, Wichita, KS, October 29, 2010.
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43. "Solvothermal Reaction of Copper and Indium Salts with Sulfur/selenium Mixtures in Oleylamine," Ingersoll, M.A.*; Jensen, M.R.*; Slymaker, L.E.*; Olejníček, J.; Darveau, S.A.; Exstrom, C.L., *45th Midwest Regional Meeting of the American Chemical Society*, Wichita, KS, October 29, 2010.
44. "Investigation of an Aqueous-based Solution Method for Preparing CuInSe_2 using KBH_4 as a Selenium Reducing Agent," Jensen, M.R.*; Hervert, B.A.*; Darveau, S.A.; Exstrom, C.L., *45th Midwest Regional Meeting of the American Chemical Society*, Wichita, KS, October 29, 2010.
45. "Chemical Deposition of Microcrystalline Se Films from Commercial Se Powder in Ethylenediamine Solvent Mixtures," Hoffman, N.M.*; Slymaker, L.E.*; Olejníček, J.; Exstrom, C.L.; Darveau, S.A.; Soukup, R.J.; Ianno, N.J.; Amitabha, S., *45th Midwest Regional Meeting of the American Chemical Society*, Wichita, KS, October 29, 2010.
46. "Solvothermal Reaction Studies of FeS_2 and SnS_2 Nanoparticle Formation," Webber, T.E.*; Neville, C.; Slymaker, L.E.*; Olejníček, J.; Darveau, S.A.; Exstrom, C.L.; Soukup, R.J.; Ianno, N.J.; Amitabha, S., *45th Midwest Regional Meeting of the American Chemical Society*, Wichita, KS, October 29, 2010.
47. "Properties of $\text{CuIn}_{1-x}\text{Ga}_x\text{Se}_2$ Films Prepared by the Rapid Thermal Annealing of Spray-deposited $\text{CuIn}_{1-x}\text{Ga}_x\text{S}_2$ and Se," Slymaker, L.E.*; Neville, C.; Hoffman, N.M.*; Ingersoll, M.A.*; Jensen, M.R.*; Olejníček, J.; Exstrom, C.L.; Darveau, S.A.; Soukup, R.J.; Ianno, N.J.; Amitabha, S.; Kment, Š., *Materials Research Society Symposium*, San Francisco, CA, April 25-29, 2011.
48. "Raman spectroscopy of $\text{Cu}(\text{In},\text{Al})\text{S}_2$ thin films prepared by sulfurization of metallic precursors," Olejníček, J.; Darveau, S.A.; Exstrom, C.L.; Slymaker, L.E.*; Kment, Š.; Soukup, R.J.; Ianno, N.J., *Materials Research Society Symposium*, San Francisco, CA, April 25-29, 2011.
49. "A Novel Sol-Gel Route to Pinhole-Free Iron Sulfide Thin Films," Kment, Š.; Kmentova, H.; Sarkar, A.; Soukup, R.J.; Ianno, N.J.; Krysa, J.; Hubicka, Z.; Olejníček, J.; Exstrom, C.L.; Darveau, S.A., *37th IEEE Photovoltaics Specialists Conference*, Seattle, WA, June 19-24, 2011.
50. "Preparation of Gold Nanoparticles via Oxalate Reduction of HAuCl_4 Without the Presence of Polymeric Stabilizing Agents," Lipps, K.M.*; Lueck, B.A.*; Svatora, R.L.*; Exstrom, C.L.; Darveau, S.A., *47th Midwest Regional Meeting of the American Chemical Society*, Omaha, NE, October 24-26, 2012.
51. "Studies of Iron Depletion in the Solvothermal Preparation of Nanocrystalline Pyrite FeS_2 in Oleylamine," Webber, T.E.*; Exstrom, C.L.; Darveau, S.A., *47th Midwest Regional Meeting of the American Chemical Society*, Omaha, NE, October 24-26, 2012.

52. "Effects of Aminopropyltrimethoxysilane on Gold Nanoparticle Aggregation and Binding to Crystalline and Glass Substrates," Svatora, R.L.*; Exstrom, C.L.; Darveau, S.A., *47th Midwest Regional Meeting of the American Chemical Society*, Omaha, NE, October 24-26, 2012.
53. "Effects of pH in the Synthesis of Branched Gold Nanoparticles in Water/Methanol Solutions," Lueck, B.A.*; Exstrom, C.L.; Darveau, S.A., *47th Midwest Regional Meeting of the American Chemical Society*, Omaha, NE, October 24-26, 2012.
54. "Nanocrystalline FeS₂ Prepared from Iron(III) N,N-diethyldithiocarbamate," Hanrahan, M.P.*; Clements, A.R.*; Darveau, S.A.; Exstrom, C.L. *48th Midwest Regional Meeting of the American Chemical Society*, Springfield, MO, October 16-18, 2013.
55. "Films of Anisotropic Gold Nanoparticles Deposited using Chemisorption- and Physisorption-based Methods," Svatora, R.L.*; Darveau, S.A.; Exstrom, C.L. *48th Midwest Regional Meeting of the American Chemical Society*, Springfield, MO, October 16-18, 2013.
56. "Kinetics of Gold Nanoparticle Synthesis Monitored by Raman Spectroscopy," Lueck, B.A.*; Exstrom, C.L.; Darveau, S.A. *48th Midwest Regional Meeting of the American Chemical Society*, Springfield, MO, October 16-18, 2013.
57. "Anisotropic Gold Nanoparticles Prepared by the Reduction of HAuCl₄ with HEPES: Optimization of Synthesis Conditions and Shape Stabilization by Protein A," Neumann, M.M.*; Darveau, S.A.; Exstrom, C.L. *49th Midwest Regional Meeting of the American Chemical Society*, Columbia, MO, November 12, 2014.
58. "Immobilization and Functional Coating of Gold Nanoparticles in a Polydimethylsiloxane Microfluidic Device Structure," Blum, J.R.*; Svatora, R.L.; Kounovsky-Shafer, K.L.; Darveau, S.A.; Exstrom, C.L. *49th Midwest Regional Meeting of the American Chemical Society*, Columbia, MO, November 13, 2014.
59. "Formation of WSe₂ Thin Films *via* Annealing of a Solvothermally Prepared Nanocrystalline Precursor," Edgar, J.S.*; Hanrahan, M.P.*; Exstrom, C.L.; Darveau, S.A. *249th National Meeting of the American Chemical Society*, Denver, CO, March 22-26, 2015.
60. "Thermal and Electronic Effects on the Solvothermal Formation of Nanocrystalline WSe₂ in Aromatic Solvents," Hanrahan, M.P.*; Edgar, J.S.*; Darveau, S.A.; Exstrom, C.L. *249th National Meeting of the American Chemical Society*, Denver, CO, March 22-26, 2015.
61. "Combining Microfluidics and Gold Nanoparticle Sensing toward the Development of Surface Plasmon Resonance Detection of Viruses in Polydimethylsiloxane Microchannels," Kounovsky-Shafer, K.L.; Blum, J.R.*; Svatora, R.L.*; Darveau, S.A.; Exstrom, C.L. *249th National Meeting of the American Chemical Society*, Denver, CO, March 22-26, 2015.
62. "Stabilization of Anisotropic Gold Nanoparticle Shapes by Protein A," Lueck, B.A.*; Darveau, S.A.; Exstrom, C.L. *249th National Meeting of the American Chemical Society*, Denver, CO, March 22-26, 2015.
63. "Stability of Gold Nanoparticle-based Films Deposited on Plasma-etched Borosilicate Glass *via* a Layer-by-layer Physisorption Technique," Svatora, R.L.*; Darveau, S.A.; Exstrom, C.L. *249th National Meeting of the American Chemical Society*, Denver, CO, March 22-26, 2015.
64. "Optimization of Synthesis and Annealing for a Solvothermally Prepared Nanocrystalline Precursor in Forming Nanocrystalline WSe₂," Edgar, J.S.*; Curry, C.J.*; Exstrom, C.L.; Darveau, S.A. *50th Midwest Regional Meeting of the American Chemical Society*, St. Joseph, MO, October 21, 2015.
65. "Synthesis of Gold Nanoparticles using Tea Extracts and Size Separation using Gel Electrophoresis," Neumann, M.M.*; Kounovsky-Shafer, K.L.; Darveau, S.A.; Exstrom, C.L. *50th Midwest Regional Meeting of the American Chemical Society*, St. Joseph, MO, October 21, 2015.
66. "Fabrication of a Meso-fluidic Device for a Virus Biosensor," Ripp, A.E.*; Blum, J.A.*; Darveau, S.A.; Exstrom, C.L.; Kounovsky-Shafer, K.L. *50th Midwest Regional Meeting of the American Chemical Society*, St. Joseph, MO, October 21, 2015.
67. "Immobilization of Gold Nanoparticles in a Meso-fluidic Device," Blum, J.A.*; Ripp, A.E.*; Kounovsky-Shafer, K.L.; Darveau, S.A.; Exstrom, C.L. *50th Midwest Regional Meeting of the American Chemical Society*, St. Joseph, MO, October 22, 2015.

68. "Determination of the Illumination Profile for a Blue Light Transilluminator," Breemes, M.K.*; Exstrom, C.L.; Darveau, S.A.; Kounovsky-Shafer, K.L. *50th Midwest Regional Meeting of the American Chemical Society*, St. Joseph, MO, October 22, 2015.
69. "Gel Electrophoresis as a Method for Separating Polydisperse Gold Nanoparticles by Size," Blum, J.A.*; Neumann, M.M.*; Kounovsky-Shafer, K.L.; Exstrom, C.L. *51st Midwest Regional Meeting of the American Chemical Society*, Manhattan, KS, October 26-28, 2016.
70. "Quantification and Kinetics Studies of Gold Nanoparticle Formation *via* the Reduction of Polyphenol Compounds," Neumann, M.M.*; Kounovsky-Shafer, K.L.; Darveau, S.A.; Exstrom, C.L. *51st Midwest Regional Meeting of the American Chemical Society*, Manhattan, KS, October 26-28, 2016.
71. "Phase Identification of Femtosecond Laser Surface Processed Materials Using Raman Spectroscopy," Breemes, M.K.*; Colling, W.M.*; Darveau, S.A.; Exstrom, C.L.; Tsubaki, A.; W.C. Thomas; Zuhlke, C.A.; Alexander, D.R. *51st Midwest Regional Meeting of the American Chemical Society*, Manhattan, KS, October 26-28, 2016.
72. "Incorporation of Silica Aerogels in Femtosecond Laser Surface Processed Materials," Hansen, L.M.*; Colling, W.M.*; Darveau, S.A.; Exstrom, C.L. *51st Midwest Regional Meeting of the American Chemical Society*, Manhattan, KS, October 26-28, 2016.
73. "Facile One-pot Synthesis of WSe₂ Nanoparticle from the Reaction between Diphenyl Diselenide and Tungsten Hexacarbonyl," Blum, J.A.*; Colling, W.M.*; Darveau, S.A.; Exstrom, C.L. *52nd Midwest Regional Meeting of the American Chemical Society*, Lawrence, KS, October 19, 2017.
74. "Chemistry of Tungsten-selenium Nanocrystalline Product Formation from a Mild-Temperature Reaction between Tungsten Hexacarbonyl and Selenium," Colling, W.M.*; Blum, J.A.*; Darveau, S.A.; Exstrom, C.L. *52nd Midwest Regional Meeting of the American Chemical Society*, Lawrence, KS, October 19, 2017.
75. "Fabrication of WSe₂ Thin Films *via* a Mild Temperature Selenization of Chemical Bath-deposited Tungsten Oxide," Falconer, M.E.*; Darveau, S.A.; Exstrom, C.L. *52nd Midwest Regional Meeting of the American Chemical Society*, Lawrence, KS, October 19, 2017.
76. "Effect of Silica Aerogel Embedment on the Wetting Properties of Femtosecond Laser Surface Processed Aluminum-1100 Surfaces," Everitt, K.R.*; Tanbouza-Husseini, A.*; Darveau, S.A.; Exstrom, C.L.; Peng, E.; Shield, J.E.; Bell, R.B.; Zuhlke, C.A.; Alexander, D.A. *52nd Midwest Regional Meeting of the American Chemical Society*, Lawrence, KS, October 19, 2017.
77. "Manipulation of Femtosecond Laser Processed Aluminum-1100 surface wetting behavior *via* coating by silanes with long-chain alkyl or fluoroalkyl substituents," Tanbouza-Husseini, A.*; Everitt, K.R.*; Darveau, S.A.; Exstrom, C.L. *52nd Midwest Regional Meeting of the American Chemical Society*, Lawrence, KS, October 19, 2017.
78. "Effects of Acid Catalysts on the Preparation of Ambient-dried Titania Aerogels," Hansen, L.M.*; Darveau, S.A.; Exstrom, C.L. *52nd Midwest Regional Meeting of the American Chemical Society*, Lawrence, KS, October 19, 2017.
79. "Assessment of the hydration of Portland cement with admixed corn ash using thermogravimetric analysis and isothermal calorimetry," Shakouri, M.; Exstrom, C.L. *American Ceramic Society 10th Advances in Cement-Based Materials conference*, Urbana, IL, June 16-18, 2019.
80. "Using complete identification of an inorganic complex as a unifying theme in a multi-technique instrumental boot-camp as part of a new integrated advanced undergraduate chemistry laboratory course," Darveau, S.A.; Exstrom, C.L.; Kounovsky-Shafer, K.L. *54th Midwest Regional Meeting of the American Chemical Society*, Wichita, KS, October 16-18, 2019.
81. "pH-dependent Chloride Desorption Isotherms of Portland Cement Paste," Jeong, C.-H.*; Paccini, G.D.*; Teymouri, M.; Vaddey, N.P.; Exstrom, C.L.; Shakouri, M. *American Concrete Institute Virtual Concrete Convention*, October 17-21, 2021.

GRANTS and CONTRACTS FUNDED -- grants listed in bold are currently active:

1. Principal Investigator for "Synthesis and Physical Studies of Novel Organometallic Complexes that are Potential Environmental Sensors for the Detection of Hazardous Organic Vapors in the Environment", \$2000, UNK Research Services Council (internal), 1996-1997
2. Principal Investigator for "Acid-Base Sensors: Preparation and Chemistry of 'Reusable pH Test Strips'", \$3990, UNK Research Services Council (internal), 1998
3. Principal Investigator for "Effects of Molecular Modifications on the Degree of Charge-Transfer-to-Diimine Solvatochromism in Square-Planar Complexes", \$24,838, Petroleum Research Fund (type B), 1998-2000.
4. Principal Investigator for "Molecular Modification Effects on Charge-Transfer-to-Diimine Solvatochromic Shifts", \$23,303, Research Corporation, 1998-2000.
5. Project Director for "Summer Program to Enhance Rural High School Student Awareness of the Chemical Sciences", \$19,949, Camille and Henry Dreyfus Foundation (Special Grants Program), 1999-2000.
6. Co-PI for "Implementation of a Writing-Intensive Chemistry Laboratory Curriculum", \$128,957, National Science Foundation (CCLI Adapt & Adopt), 1999-2001.
7. Project Director for "Soil-Vapor and Groundwater Monitoring at the EPA Cleburn Street Superfund Site", \$229,854, Nebraska Department of Environmental Quality, 2000-2002.
8. Project Director for "A Multicampus Renewable Energy Laboratory of Excellence", \$303,255, Nebraska Research Initiative program, 2002-2006.
9. Principal Investigator for "Preparation of Color-Changing "Molecular Square" Materials using Amino Acids as Linkers", \$3483, UNK Research Services Council (internal), Summer 2005.
10. Principal Investigator for "CIBS Solar Cell Development", \$770,000, U.S. Department of Energy, 2006-2008.
11. Institutional Project Director for "A New Wide Bandgap Material for Semiconductor Solar Cell Materials", \$132,000, University of Nebraska-Lincoln (Nebraska Research Initiative Program), 2006-2010
12. Institutional co-PI for "Satellite Contaminant Materials Program", \$134,523, University of Nebraska-Lincoln (NASA), 2008-2011.
13. Principal Investigator for "CIBS Solar Cell Development", \$936,000, U.S. Department of Energy, 2008-2011.
14. Institutional co-PI for "New Science and Engineering of Carbon-Based Low-Dimensional Nanoelectronics", \$50,000, University of Nebraska-Lincoln (Nebraska Research Initiative Program), 2009-2010.
15. Institutional PI for "Low-cost, Non-vacuum Nanomanufacturing of the Absorber Layer of High-efficiency Solar Cells," \$20,600, University of Nebraska-Lincoln (Nebraska Center for Energy Sciences Research), 2010-2011.
16. Institutional PI for "Center for Nanohybrid Functional Materials," \$312,990, Nebraska EPSCoR (NSF-RII), 2010-2015 (no-cost extension through August 15, 2016).
17. Project Director for "Nanoscale Imaging at the Benchtop: Enhancing Materials Science Research and Education across the Physical and Life Sciences using New Low-Voltage Electron Microscope Technology," \$286,610, Nebraska Research Initiative Program, 2011-2012.
18. Institutional PI for "Development of High-Efficiency, Low-Cost Thin Film Solar Cells Based on Naturally Abundant and Non-Toxic Materials," \$29,112, University of Nebraska-Lincoln (Nebraska Research Initiative), 2012-2014.
19. Principal Investigator for "Acquisition of a benchtop x-ray diffractometer to enhance materials science research across the physical and earth sciences at UNK," \$64,000, Nebraska Research Initiative Program, 2013-2014.

20. Institutional PI for "Highly Permanent Biomimetic Micro/Nanostructured Surfaces by Femtosecond Laser Surface Processing for Thermal Management Systems," \$90,369, NASA Nebraska Space Grant Program (NASA-EPSCoR), 2014-2018.
21. Co-PI for "Helping Middle School Science Teachers Create Content-based Digital Games on the Structure and Energy of Matter," \$58,617, Nebraska Department of Education Post-Secondary Coordination Commission, 2016-2017.
22. **PI for "Development of Next-generation Photovoltaic Solar Cells based on Tungsten Selenide," \$175,000, University of Nebraska Foundation, 2016-2018 (currently in no-cost extension period).**
23. Co-PI for "Use of Lignocellulosic Biomass Wastes as Portland Cement Replacement Materials in Concrete," \$8,000, UNK Research Services Council (internal), 2018-2019
24. co-PI for "Chloride binding and desorption behavior of cementitious systems exposed to low pH environments," \$8,800, UNK Research Services Council (internal), 2020-2021.
25. **Co-PI for "Developing an Alternative Ementitious Material from Raw Corn Stover and Bioethanol Production Plants' Waste Products," \$19, 223 (UNK portion), NU Collaborative Initiative Grant (Team Forming Seed Grant), 2021-2023.**

UNFUNDED AND PENDING GRANT PROPOSALS:

- Principal Investigator for "Studies of Host-Guest Interactions Between Novel Solvatochromic Pt(II) and Pd(II) Macrocyclic Complexes and Volatile Organic Vapor", \$16,814, Research Corporation (**submitted November 15, 1996**)
- Project Director for "Enhancement of Undergraduate Laboratory Instruction and Research in Analytical Chemistry", \$38,700, National Science Foundation (ILI) (**submitted November 15, 1996**)
- Co-PI for "Spectrometric Properties of Polymeric Acridines", \$346,559, EPSCoR (DoD program) (**submitted May 6, 1997**)
- Principal Investigator for "Preparation and Studies of Macrocyclic Sensor Materials that Detect Hazardous Organic Compounds in Water Samples:", \$278,535, EPSCoR (DoD program) (**submitted May 6, 1997**)
- Project Director for "Enhancement of Undergraduate Laboratory Instruction and Research in Solid-State Chemistry", \$55,405, National Science Foundation (ILI) (**submitted November 14, 1997**)
- Co-PI for "Thin Film Semiconductor Materials Manufactured using a Unique Supersonic, Multicathode Plasma-Chemical Reactor with Hollow Cathodes", \$598,299, University of Nebraska (Nebraska Research Initiative) (**submitted December 1, 1997**)
- Co-PI for "Development of a Medicinal Chemistry Initiative in Anticancer and Antiviral Research", \$557,100, University of Nebraska (Nebraska Research Initiative) (**submitted December 1, 1997 -- not funded**)
- Co-PI for "Cost-Effective Solar Cells: A Renewable Energy Program", \$526,334, Nebraska Research Initiative (**submitted December 1, 1999 -- not funded**).
- Project Director for "Undergraduate Curriculum and Service Enhancement by Atomic Spectroscopy", \$26,375, Camille & Henry Dreyfus Foundation (**submitted July 1, 2001 -- not funded**)
- Co-PI for "Electrically Insulating Tribological Coatings", \$482,580, Nebraska Research Initiative (**submitted December 1, 2001 -- not funded**).
- Co-PI for "Light Weight, Mobile Solar Cell Structures", \$594,197, Nebraska DEPSCoR, US Army Research Office (**submitted August, 2002 -- not funded**)

- Co-PI for "High Frequency, High Power Heterojunction Devices Based on Silicon Carbide", \$426,771, University of Nebraska (Nebraska Research Initiative) (**submitted December 1, 2003 – not funded**)
- PI for "Reaction Pathway Studies of the Solvothermal Preparation of $\text{CuIn}_{1-x}\text{M}_x\text{Se}_2$ (M = Ga, Al, B) Nanocrystalline Materials", \$348,839, National Science Foundation (**submitted September 15, 2007 – not funded**)
- Institutional PI for "Exploring Low-bandgap Inorganic Nanocrystals as Donors in Organic/Inorganic Hybrid Solar Cells," \$223,203, University of Nebraska-Lincoln (NSF-DMR-EPM), 2010-2013. (**submitted October 15, 2009 – not funded**)
- Institutional PI for "Agile Non-Vacuum Photovoltaic Research and Development Center," \$841,620, Nebraska EPSCoR (DOE), 2010-2013. (**submitted October 15, 2009 – not funded**)
- Institutional PI for "Development of High Efficiency Pyrite Nanocrystal Solar Cells from Phase Pure and Surface Stable Pyrite Nanocrystals," \$111,147, University of Nebraska-Lincoln (NSF-CBET), 2011-2014 (**submitted March 3, 2011 – not funded; revision for \$87,920 submitted February 15, 2012 – not funded; revision for \$42,840 submitted February 15, 2013 – not funded**)
- co-PI for "MRI: Acquisition of a 400-MHz NMR Spectrometer to Enhance Chemistry Research and Education at UNK," \$339,750, NSF-MRI, 2012-2014. (**submitted January 26, 2012 – not funded**)
- co-PI for "Single-Crystal Optical-Fiber Probes for in vivo Raman Spectroscopy," \$25,000, University of Nebraska-Lincoln (Nebraska Research Initiative), 2013-2015 (**submitted November 1, 2012 – not funded**)
- Institutional PI for "Two-phase Flow Heat Transfer in Metallic Microchannels with Integrated Femtosecond Laser Fabricated Functionalized Micro/Nano Structures," \$8,667, University of Nebraska-Lincoln (Nebraska Research Initiative), 2014-2016 (**submitted November 1, 2013 – not funded**)
- Institutional PI for "Next Generation of Thermal Management Control in High Power Laser Diodes and Associated Weapon Systems Using Femtosecond Laser Processed Surfaces in Microchannel Coolers; Diamond Thermal Plates/ Inclusions," \$255,666, University of Nebraska-Lincoln (Office of Naval Research), 2017-2022 (**submitted August 29, 2016 – not funded**)
- co-PI for "Atomic Force Microscope," \$194,205, Nebraska Research Initiative, 2017 (**submitted December 23, 2016 – not funded**)

UNK UNDERGRADUATE RESEARCH STUDENTS MENTORED -- semesters of research activity in parentheses.
Current group members are listed in bold

	Student	Research Project
1	Rupesh Shrestha (96F – 97S)	Preparation and Study of Pd(II) Interligand Charge-transfer Complexes
2	Andy Johansen (97S)	Spectroscopy of Pd(II) Interligand Charge-transfer Complexes
3	Matthew Polk (97S – 97U)	Acid-Base Chemistry of Novel Nitrophenylhydrazine Derivatives
4	Devis Sinani (97S – 99F)	Diimine Structural Effects on the Spectroscopic Properties of Copper(II) Diimine Catecholate Complexes
5	Ben Fagot (98S - 00S)	Preparation and Solution Properties of Nickel Complexion Pairs
6	Sara Bolling (98S)	Preparation and Chemistry of Novel Acridine and Pyridine Hydrazones
7	Kristina Garnett (98S)	Spectroscopy of Organic Anions in Various Solvents
8	Shane Kohl (98S)	Analysis of Drinking Water for Heavy Metals by Atomic Absorption Spectroscopy. Correlation to Onset of Parkinson's Disease

9	Jeff Seier (98S)	Analysis of Drinking Water for Heavy Metals by Atomic Absorption Spectroscopy. Correlation to Onset of Parkinson's Disease
10	Kristi Holmes (98F, 99U)	Pi-donor Substituent Effects on the Solvatochromic Shifts of Palladium(II) Charge-Transfer-to-Diimine Complexes
11	Greg Weber (98F – 99F)	Diimine Substituent Effects on the Solvatochromic Shifts of Palladium(II) Charge-Transfer-to-Diimine Complexes
12	Tim Slocum (99S - 00S)	Preparation and Study of Pd(II) Salicylate Complexes
13	Christopher Ferris (00U - 00F)	Preparation of Solvatochromic Werner Complexes
14	Gina Kissel (00U - 00F)	Preparation and Study of Cadmium Charge-Transfer Complexes
15	Joshua Skrdla (01S)	Preparation of Novel Fe(II) MLCT Complexes and their Preferential Solvation Properties
16	Brian Leonard (01F - 03S)	Preparation And Solvation Studies On Cadmium(II) Diimine Catecholate And Dithiolate Complexes
17	Brent Barta (02S)	Preparation of Novel Fe(II) MLCT Complexes and their Preferential Solvation Properties
18	Jenny Smith (00U, 03F)	Preparation and Study of Binuclear Pd Charge-Transfer Complexes
19	Amanda Peterson (02U)	Analysis of Drinking Water for Heavy Metals by Atomic Absorption Spectroscopy. Correlation to Onset of Parkinson's Disease
20	Lancia Darville (02U - 03S)	Analyses of Iron Content in the Platte River Water Using Ultraviolet-Visible Spectroscopy and Atomic Absorption
21	Scott Meisenbach (02F)	Method Development for Infrared Analysis of Thin Film Materials
22	Notabushi Ota (03S – 03U)	Ellipsometric Analysis of SiGe:H Thin Film Materials
23	Kyoko Okuno (03S – 03U)	Infrared Spectroscopic Analysis of SiGe:H Thin Film Materials
24	Marc Penny (03S – 03F)	Reflective Spectroscopy Method Development for Thin Film Characterization
25	Ruth Udey (03S – 05S)	Raman Spectroscopic and Ellipsometric Analysis of SiGe:H and GeC Thin Films Materials
26	Tiffany Feldman (04U – 04F)	Spin Coating Thin Film Materials of Charge-Transfer Complexes
27	Preston Larson (04F – 08S)	Preparation of Novel Solvatochromic “Molecular Grid” Materials
28	Andrea Martinez-Skinner (04F – 08S)	Preparation and Characterization of Novel Water-Soluble Mo(diimine)(CO) ₄ Complexes; Wet Chemical Preparation of CIS Materials
29	Christina Garretson (05U)	Preparation and Vapochromic Properties of Fe(diimine) ₂ (CN) ₂ Complexes
30	Bradley Miller (05F – 07S)	Solvatochromic Properties of Group 6 Isocyanide Complexes
31	Peter Longo (06S – 06F)	CdS Thin Film Preparation by Chemical Bath Deposition
32	Ashley Vandeventer (06S – 10S)	Development of Se Nanoparticles for Spray Deposition
33	Matt Ingersoll (07S – 11S)	Solvothermal Reaction of Copper and Indium Salts with Sulfur/selenium Mixtures in Oleylamine
34	Anatole Mirasano (07S – 08F)	Solvothermal Preparation, Processing, and Characterization of Nanocrystalline CuIn _{1-x} Al _x Se ₂ Materials
35	Ayumi Yamanashi (07S)	Preparation and Characterization of Mo(diimine)(PR ₃)(CO) ₃ Complexes

36	Mike Norris (07S)	Solvatochromism of Group 6 Diimine-Phosphine Complexes
37	Laura Slaymaker (08S – 11F)	CuIn _x Ga _(1-x) Se ₂ Films Prepared by Rapid Thermal Annealing of Layered Nanocrystalline CuIn _x Ga _(1-x) S ₂ and Se
38	Brandon Karlin (08S)	Solvothermal Preparation of CuInSe ₂ -Family Materials
39	David Paprocki (08S – 11S)	Size and Shape Control of Gold Nanostructures; Raman studies of Mn-doped CuInSe ₂ -based Chalcopyrites
40	Megan Schliefert (08S – 11S)	Size and Shape Control of Gold Nanostructures; Raman studies of Mn-doped CuInSe ₂ -based Chalcopyrites
41	Joe Shanle (08F)	Solvothermal Preparation of CuInSe ₂ -Family Solar Cell Materials
42	Chelsey Cook (08F – 09F)	CuInS ₂ Preparation via Aqueous Solution-based Methods
43	Tiffani Doss (09S)	Solvothermal Preparation of CuInSe ₂ -Family Solar Cell Materials
44	Mark Gardner (09S)	Solvothermal Preparation of CuInSe ₂ -Family Solar Cell Materials
45	Matt Jensen (09S – 12S)	CuInS ₂ Preparation via Aqueous Solution-based Methods; Preparation and Studies of Nanocrystalline FeS ₂ and SnS ₂
46	Thomas Webber (09U – 13S)	Preparation and Studies of Nanocrystalline FeS ₂ and SnS ₂
47	Maurice Chessmore (10S – 10U)	ICP-OES Analyses of Sulfur from Semiconductor Materials
48	Britni Hervert (10U)	CuInSe ₂ Preparation via Se reduction by KBH ₄
49	Nathan Hoffman (10U – 12S)	Chemical Bath Deposition of Selenium for Solar Cell Fabrication
50	Jesse Lange (11S-11F)	Fabrication and Characterization of CIGS Thin Films
51	Loany Fajardo (11S)	Preparation and Studies of Nanocrystalline FeS ₂ as a Solar Cell Absorber
52	Kirsten Lipps (11F – 12U)	Development of Controlled Syntheses of Branched Au Nanoparticles
53	Bethany Lueck (12S – 15S)	Synthesis of Novel Branched Au Nanoparticles for Biosensor Applications
54	Becky Svatora (12U – 15S)	Studies of Au Nanoparticle Films as Biosensors
55	Xiaojun Liu (12F)	Studies of Au Nanoparticle Binding Interactions to Crystalline and Glassy Substrates
56	Bjorn Lund (12F – 13S)	Iron Pyrite Nanoparticle Formation and Growth Mechanistic Studies
57	Aspen Clements (13S – 13F)	Iron Pyrite Nanoparticle Formation and Growth Mechanistic Studies
58	Zack Colgrove (13S – 13U)	Synthesis and Coating of Novel Branched Au Nanoparticles for Biosensor Applications
59	Daniel Connor (13S)	Synthesis of Novel Branched Au Nanoparticles for Biosensor Applications
60	Michael Hanrahan (13S – 16S)	Solvothermal Preparation of Nanocrystalline Tungsten Selenide
61	Ryan Matzen (13S)	Synthesis of Novel Branched Au Nanoparticles for Biosensor Applications
62	Molly O'Brien (13S)	Synthesis of Novel Branched Au Nanoparticles for Biosensor Applications
63	Jessica Blum (14S – 18S)	Immobilization of Au Nanoparticles in Biosensor Devices
64	Miranda Neumann (14S – 16F)	Au Nanoparticle Synthesis using Tea antioxidants

65	Mallory Breemes (14S, 15U-17S)	Fluorescence Sensing in Biosensor Applications
66	Shane Swanson (14S)	Studies of Deposition and Growth of Thin-film WSe ₂
67	Mariana Bartlotti Garcia (14S)	Synthesis of Novel Branched Au Nanoparticles for Biosensor Applications
68	Joshua Edgar (14U – 16S)	Non-vacuum Fabrication of Thin-film Tungsten Selenide
69	Keegan McGill (15S – 15F)	Strategies for Preventing Non-Specific Protein Binding to Substrates in Biosensor Prototypes
70	Cody Masters (15U)	Strategies for Preventing Non-Specific Protein Binding to Substrates in Biosensor Prototypes
71	C.J. Curry (15U – 16S)	Non-vacuum Fabrication of Thin-film Tungsten Selenide
72	Whitney Colling (16S – 18U)	Non-vacuum Fabrication of Thin-film Tungsten Selenide
73	Logan Hansen (16U – 17U)	Aerogel Synthesis for Support of FLSP Nanostructures
74	Megan Falconer (17S – 19S)	Fabrication of Tungsten Selenide from Tungsten Oxide
75	Keith Everitt (17S – 18U)	Aerogel Embedding in FLSP Nanostructures
76	Ali Tanbouza-Husseini (17S – 18U)	Silane Coating of FLSP Nanostructures
77	Brittany Zimmerman (18S – 19F)	Non-vacuum Fabrication of Thin-film Tungsten Selenide
78	Chul-Hyun Jeong (19F – 21S)	Fabrication of Tungsten Selenide from Tungsten Oxide
79	Guilherme Piccini, ITEC (19F)	XRD and TGA Characterization of Corn Ash-fortified Concrete
80	Todd Cerny, ITEC (20S)	TGA Characterization of Corn Ash-fortified Concrete
81	Anna Law (21F - present)	XRD and TGA Characterization of Corn Ash-fortified Concrete
82	Francisco Cantillo Villalba (22S)	XRD and TGA Characterization of Corn Ash-fortified Concrete
83	Seth Yarnell (22S)	XRD and TGA Characterization of Corn Ash-fortified Concrete

MOST NOTABLE & EXTENSIVE SERVICE ACTIVITIES

Director of the UNK online Science/Math Education M.S.Ed. Program (2012-2019). In this capacity, my responsibility and activities include the following:

- Serve as program Committee Chair
- Manage program differential tuition income
- Work with Chairs of participating departments (Biology, Chemistry, Math, Physics, Teacher Education) to develop and schedule online courses
- Coordinate program application evaluation process
- Evaluate degree candidacy applications
- Conduct comprehensive exam (written and oral components) process
- Maintain program website
- Work with eCampus to development program marketing initiatives
- Respond to prospective student inquiries

Creator and Director of UNK Department of Chemistry Research Apprenticeship Program (2006-present). In this program, 10-12 freshmen from the Fall CHEM 160 course are invited to join chemistry research groups in the following Spring

semester. The apprenticeships last 8 weeks (3 hours of lab work per week) and the students earn a \$150 scholarship. Experience research students who serve as student mentors to the apprentices earn a \$200 stipend. I coordinate the recruitment of apprentices and serve as the primary contact for students during this process.

Steering Committee Member and Training Curriculum Developer, Nebraska School Chemical Cleanout Campaign, Keep Nebraska Beautiful (2007-2009). The non-profit group Keep Nebraska Beautiful has initiated a new Nebraska School Chemical Cleanout Campaign that is designed to assist schools in disposing of outdated chemicals and educating pre- and in-service teachers on proper chemical safety. I have developed a 1-credit online course on chemical hygiene and safety that has been offered through UNK (as CHEM 899P) several times since Spring 2009. I have presented ESU workshops to teachers across the state on chemical safety, inventory compiling, and storage. This EPA-funded initiative is expected to impact Rule 24 requirements for chemistry teaching endorsement requirements.

Service Contract -- Project Director for "Cleburn Street Superfund Site Environmental Sampling and Monitoring", Nebraska Department of Environmental Quality (NDEQ), \$229,854 (2000-2002). Volatile organic compounds levels were monitored at a soil-vapor extractor and groundwater wells in the Grand Island, Cleburn Street area. I acted as liaison to NDEQ, prepared and submitted quarterly and annual reports, processed supply/salary paperwork, contracted out engineering maintenance tasks and laboratory analyses that could not be done in our department, hired and coordinated student laboratory technicians (8 different students over the 3-year period) and travel for vapor sampling, prepared and maintained vapor sampling equipment for weekly inspections, reported weekly VOC level data. I also traveled to the site and supervised quarterly water sampling, prepared equipment for sampling events, prepared samples for analysis and reported results.

Coordinator of annual summer UNK Adventures in Chemistry Camp for high school students, 1998-2003 (D, Col, U, Com) – In order to establish closer ties with regional high school chemistry teachers, step up recruiting of promising science students, and provide high schools with experience with lab techniques and equipment that are unavailable in most high school laboratories, In 1998, Michael Mosher and I created a week-long residential summer chemistry camp for exceptional high school science students in the state of Nebraska. The students were introduced to a variety of laboratory and instrumental techniques (UV-vis, IR, and NMR spectroscopy) that are not typically experienced until well into a college career. Additionally, there were field trips to regional chemistry facilities such as Ward Laboratories, the chemistry lab at Eaton Manufacturing, and the biochemistry labs at the USDA Meat Animal Research Center. This was one of the programs offered as in the UNK Division of Continuing Education Summer Synergy.

My administrative roles included coordinating the direct marketing/advertising and the camp admission processes, making residence hall arrangements, hiring and supervising undergraduate camp counselors, arranging field trips, and managing camp finances. In January, a mailing is sent to all Nebraska high school science teachers asking them to nominate up to 5 promising math and science students for camp attendance. Applications were solicited from those students nominated, and students were chosen by myself and camp co-coordinator Michael Mosher to attend based on year in school (juniors are preferred), strength of academic background, and suitability of the camp for career plans. For the first camp, we received 34 applications (out of the 114 students nominated) for 12 spots. Thanks to the above-listed grant from the Camille and Henry Dreyfus Foundation, the camp was expanded in 1999 and 2000 from one to two sessions of 16 students each. Additionally, the student fee was lowered from \$275 to \$50

The Bruner Hall Phase I renovation prevented a camp offering in 2001. With support from the UNK Honors Program and NU Priority Program Funds, the camp brought in 11-14 students per year in 2002 and 2003. Curricular improvements made during this time featured the inclusion of faculty from other disciplines – Joan Blauwkamp from Political Science and Tom Martin and Dave Rozema from Philosophy – who added class and discussion sections on topics that bridged chemistry with environmental, political, and ethical issues.

Coordinator of CNSS Summer Academic Camps for high school students, 2004 (D, Col, U, Com) – The ideas behind the Adventures in Chemistry Camp were expanded to four simultaneous academic camps in the Departments of Biology, Chemistry, CSIS, and Political Science. The camp brought in 24 students across these disciplines. My administrative roles were similar to those for the previous chemistry camp but individual faculty directors developed the curricular components within each individual camp.

Department Equipment Maintenance (D) – Listed below are department equipment items for which I take at least a significant share of maintenance responsibility:

Bruker D2 Phaser X-ray Diffractometer – primary caretaker

LVEM-5 Electron Microscope – primary caretaker

Varian 720-ES ICP-OES – primary caretaker, attended training workshop in December 2008

Nexus 680 Fourier-Transform Infrared Spectrophotometer -- primary caretaker, replaced MCT detector, implemented software upgrade to system, supervised installation of new research-grade instrument

Computer-Driven Electroanalyzer -- primary caretaker, installed system.

Magnetic Susceptibility -- obtained through my research grant funds, primary caretaker, installed system.

Academic Advisor (D) -- I serve as academic advisor for 11 undergraduate chemistry students and 55 graduate students. *I am the designated department advisor for all students pursuing the grade 7-12 Chemistry Subject Teaching Endorsement as well as the primary or secondary advisor for all Science/Math Education M.S.Ed. graduate students.*

OTHER CURRENT AND RECENT COMMITTEE ASSIGNMENTS & SERVICE POSITIONS

Member, Chemistry Department Safety Committee, 2020-present (D)

Member, Chemistry Department Outreach Committee, 2016-present (D)

Parliamentarian, College of Arts & Science, 2021-present (Col)

Member & CAS representative, Faculty Advisory Committee for Reduction In Force, 2020-2021 (U)

Member & UNK representative, NU System Core Research Facilities Subcommittee, 2017-present (U)

Member, UNK Conflict of Interest Committee, 2017-present (U)

Member of Faculty Senate Academic Freedom & Tenure Committee, 2005-2009, 2011-2013, 2015-2020 (Col, U) – elected by NSS faculty.

- Chair, 2007-2009, 2011-2013, 2016-2020
- Coordinated the review and revision of UNK Post-Tenure Review campus policy document

PAST COMMITTEE ASSIGNMENTS & SERVICE POSITIONS

Member, Nebraska EPSCoR First Award Grant Evaluation Subcommittee, 2009, 2018 (U)

Member, Dean of Graduate Studies search committee, 2018-2019 (U)

Member, UNK Undergraduate Research Council, 2012-2018 (U)

Member, UNK Graduate Council, 2014-2017 (U)

Chair, UNK Graduate Academic Programs Committee, 2016-2017 (U)

Member, CAS Merger Consitution Committee, 2017 (Col)

Chair, CNSS *ad hoc* Faculty Mentoring & Development Committee, 2016-2017 (Col)

Member, Chemistry Dept Marketing Committee, 2016-present (D)

Member, CNSS Rank and Tenure Committee, 2013-2016 (Col)

Interview Panelist for Omaha World-Herald/Kearney Hub Scholarship applicants, 2016, 2017 (U)

Member, UNK Graduate Policy & Planning Committee, 2014-2016 (U)

Member, University of Nebraska System-Wide Original Research & Creative Activity Award selection committee, 2012-2015 (U)

Member, Leland Holdt/Security Mutual Life Insurance Company Distinguished Faculty Award Selection Committee, 2011-2013 (U)

Member, Director of Sponsored Programs Search Committee, 2012-2013 (U)

Member, Board of Representatives, Sigma Xi, UNK Chapter, 2008-2012 (Prof)

Member, CNSS Advisory Committee, 2006-2012 (Col)

- Chair, 2009-2012

Member of Faculty Senate Grievance Committee, 2009-2011 (Col, U) – elected by NSS faculty.

Chemistry Department Representative on the Science/Math Education Graduate Program Committee, 2011-2012 (D, Col)

Member, UNK Academic Success Center Advisory Board, 2009-2011 (U)

Member, University of Nebraska System-Wide Innovation, Enhancement, and Development Award selection committee, 2009-2010 (U)

Member, UNK Pratt-Heins Faculty Award Committee, 2007-2009 (U)

- Chair, 2008-2009

Presenter, UNK Center for Teaching Excellence “Developing and Teaching Capstone Courses” Forum, 2009 (U)

Treasurer, Phi Kappa Phi UNK Chapter, 2002-2008 (U, Prof) – Charter member of the UNK chapter. Responsibilities include managing chapter finances, tracking chapter membership, submitting finance reports to national headquarters, and filing income tax paperwork to the IRS.

Member of Organizing Committee for 43rd Midwest Regional Meeting of the American Chemical Society held in Kearney (October 2008) (Prof) -- I served as Printing and Publicity Chair. I was responsible for the meeting website, creating calls for papers (and arranging their distribution via *Chemical and Engineering News* or bulk mail), the meeting's abstract book, and meeting signs.

Member of Organizing Committee for 36th Midwest Regional Meeting of the American Chemical Society in Lincoln (Oct. 10-13, 2001) (Prof) -- I served as Printing and Publicity Chair. I was responsible for creating calls for papers (and arranging their distribution via *Chemical and Engineering News* or bulk mail), the meeting's abstract book, and meeting signs.

Faculty Senator, 2002-2005 (Col, U) – elected by NSS faculty.

Member of Faculty Senate Oversight Committee, 2004-2005 (Col, U) – organized and ran NSS elections for Faculty Senate committee seats and senate positions.

Member of UNK Judicial Board Pool, 2004-2006 (U) – served on two hearing boards and one appellate board as part of the disciplinary action process specified in the UNK Student Handbook

Member, University of Nebraska System-Wide Department Teaching Award Selection Committee, 2007 (U)

Member, NUPATHS Scholarship Committee, 2002 (U)

Member, Honors Program Academic Program Review Team, 2003 (U)

Member, Office of Sponsored Programs Administrative Program Review Team, 2007 (U)

Member, CNSS Technology Committee, 2002 (Col)

Member of Faculty Search Committee for UNK Department of Political Science, 1999-2000 (Col)

Christopher Exstrom was the CNSS representative for an Admission Dept. Saturday Tour (2002, 2003)

Participated in chemical demonstration show presented to elementary, middle school, and high school students at Camp Arrowhead, Lexington, June 26, 2001 (Com)

Led chemical laboratory exercises for high school students at Valentine High School in conjunction with a science fair event held there, 2002 (Com)

Served as CNSS representative for Admission Dept. Saturday Tours, 2002-2003 (Col, U, Com)

Presenter, Scholars' Recognition Days, 2002 and 2003 (Col, U, Com)