Jerry D. Harris

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Education

Ph.D.	1997	Texas A&M University	Inorganic Chemistry
B.S., B.A.	1991	Northwest Nazarene University	Chemistry, Mathematics
A.S.	1987	Treasure Valley Community College	Chemistry

Professional Experience

2013-present	Professor of Chemistry, Northwest Nazarene University, Nampa, ID
2003-2013	Associate Professor, Northwest Nazarene University, Nampa, ID
2001-2003	Scholar-in-Residence, Cleveland State University, Cleveland, Ohio Visiting Scientist, NASA Glenn Research Center, Cleveland, Ohio
2000-2001	Consultant, Ohio Aerospace Institute, Brookpark, Ohio Visiting Scientist, NASA Glenn Research Center, Cleveland, Ohio
1999-2002	Adjunct Professor, Baldwin-Wallace College, Berea, OH
1997-2000	Postdoctoral Fellow, Kent State University, Kent, Ohio Visiting Scientist, NASA Glenn Research Center, Cleveland, Ohio

Synergistic Activities and Professional Societies:

(i) Member, American Chemical Society
(ii) Member, National Association of IDeA Principal Investigators
(iii) Member, American Solar Energy Society
(iv) Member, Idaho Academy of Science
(v) 2013 Summer Faculty Fellow, NASA Glenn Research Center, Cleveland, OH
(vi) Review research articles for Elsevier and American Chemical Society

Service to Northwest Nazarene University:

2003-04 Chemical Hygiene Committee
2004-05 Chemical Hygiene Committee & Faculty Activity and Care Committee
2005-08 Committee on Committees & Faculty Activity and Care Committee
2008-10 Undergraduate Academic Committee & Faculty Activity and Care Committee
2010-13 Chemical Hygiene Committee & Faculty Activity and Care Committee
2013-14 Chemical Hygiene Committee
2014-15 Concurrent Credit Program Task Force
2014-16 Chemical Hygiene Committee & Faculty Development Committee
2016-23 Chemical Hygiene Commission
2022-23 Honorary Degree Committee

Church and Community Involvement:

College Church of the Nazarene, Nampa, ID:

- 2004-23, member, Sunday school helper, Children's Bible quizzing helper, Upwards Basketball coach, Witness Relocation moving ministry, Work and Witness team member to Costa Rica.

Valley Shepherd Church of the Nazarene, Meridian, ID

- 2009-2018, Caravan leader

Boy Scouts of America, Troop 118, Nampa, ID

- 2016-2020, volunteer, troop treasurer
- 2019, Wood Badge leadership training

Teaching & Research Philosophy

Students learn and retain the most when their learning is a hands-on experience. Lectures should be structured to allow interaction with the students. A student's college experience should be supplemented with internships and faculty/student research projects. The main purpose of research at a small university should be to give the students the opportunity to experience, apply and supplement what they have learned in the classroom. Research also provides students the opportunity for one-on-one interaction with their advisor/mentor.

Publications & Patents: 52 Total

"Zinc-acetate-amine complexes as precursors to ZnO and the effect of the amine on nanoparticle morphology, size and photocatalytic activity," J.D. Harris, E.A. Wade, E.G. Ellison, C.C. Pena, S.C. Bryant, A.J. Christy, K.O. Laughlin, A.E. Harris, K.V. Goettsche, C.E. Larson, S.M. Hubbard, J.E. Cowen, J. Eixenberger, D. Estrada, and J.R. Chase, *Catalyst*., 12(10) (2022). https://doi.org/10.3390/catal12101099.

"Chapter 15 - Zinc acetate amine complexes: Single-source precursors to zinc oxide films and nanoparticles; the influence of amines on photocatalysis," J.D. Harris, in: A.W. Apblett, A.R. Barron, A.F. Hepp (Eds.), *Nanomaterials via Single-Source Precursors*, Elsevier, 2022, pp. 507-529, ISBN: 0 978 012 820 340 8. https://doi.org/10.1016/B978-0-12-820340-8.00003-4

"Chapter 17 - Commercialization of single-source precursors: Applications, intellectual property, and technology transfer," A.F. Hepp, J.D. Harris, A.W. Apblett, and A.R. Barron in: A.W. Apblett, A.R. Barron, A.F. Hepp (Eds.), *Nanomaterials via Single-Source Precursors*, Elsevier, 2022, pp. 563-600, ISBN: 0 978 012 820 340 8. https://doi.org/10.1016/B978-0-12-820340-8.00008-3

"Crystallite Size Evaluation of ZnO Nanoparticles via Transmission Electron Microscopy and X-ray Powder Diffraction," J.E. Cowen, A.E. Harris, C.C. Pena, S.C. Bryant, A.J. Christy and J.D. Harris, Microscopy and Microanalysis, Vol 22, Issue S3 (Proceedings of Microscopy & Microanalysis 2016), July 2016, pp. 1610-1611. https://doi.org/10.1017/S1431927616008898

Publications (Cont)

"Novel Materials, Processing and Device Technologies for Space Exploration with Potential Dual-Use Applications', A.F. Hepp, S.G. Bailey, J.S. McNatt, M.V.S. Chandrashekhar, J.D. Harris, A.W. Rusch, K.A. Nogales, K.V. Goettsche, W. Hanson, D. Amos, V.K. Vendra, C. Woodbury, P. Hari, K.P. Roberts, and A.D. Jones, Jr., NASA Technical Memorandum, NASA/TM—2015-218866, December 2015.

"Synthesis and characterization of $[Zn(acetate)_2(amine)_x]$ compounds (x = 1 or 2) and their use as precursors to ZnO", J.S. Hyslop, A.R. Boydstun, T.R. Fereday, J.R. Rusch, J.L. Strunk, C.T. Wall, C.C. Pena, N.L. McKibben, J.D. Harris, A. Thurber, A. Punnoose, J. Brotherton, P. Walker, L. Lowe, B. Rapp, S. Purnell, W.B. Knowlton, S.M. Hubbard, and B.J. Frost, *Mater. Sci. Semicond. Process.*, 38, (2015), 278-289. doi:10.1016/j.mssp.2015.04.001. (PMCID: PMC4465802)

"Novel Materials, Processing and Device Technologies for Space Exploration with Potential Dual-Use Applications', A.F. Hepp, S.G. Bailey, J.S. McNatt, M.V.S. Chandrashekhar, J.D. Harris, A.W. Rusch, K.A. Nogales, K.V. Goettsche, W. Hanson, D. Amos, V.K. Vendra, C. Woodbury, P. Hari, K.P. Roberts, and A.D. Jones, Jr., Proceedings of the AIAA 12th International Energy Conversion Engineering Conference, July 28-30, 2014, Cleveland, OH.

"Ferromagnetism in Annealed $Ce_{0.95}Co_{0.05}O_2$ and $Ce_{0.95}Ni_{0.05}O_2$ Nanoparticles", S.K. Misra, S.I. Andronenko, J.D. Harris, A. Thurber, G.L. Beausoleil II, and A. Punnoose, Journal of Nanoscience and Nanotechnology, 2013, Vol. 13, pp. 1–8. doi:10.1166/jnn.2013.7778

"Identifying Hydrated Salts Using Simultaneous Thermogravimetric Analysis and Differential Scanning Calorimetry," J.D. Harris and A.W. Rusch, *J. Chem. Ed.*, 2013, 90 (2) pp. 235-238. DOI: 10.1021/ed300222y.

"A Large Scale Synthesis and Characterization of Quaternary $CuIn_xGa_{1-x}S_2$ Chalcopyrite Nanoparticles via Microwave Batch Reactions", C. Sun, R.D. Westover, G. Long, C. Bajracharya, J.D. Harris, A. Punnoose, R.G. Rodriguez, and J.J. Pak, *Int. J. of Chem. Engineering*, Volume 2011, Article ID 545234. https://doi.org/10.1155/2011/545234

"Synthesis and Characterization of Chromium-Isothiocyanate-4-methylpyridine Complexes", J.L. Young, J.D. Harris, J.A. Benjamin, J.E. Fitch, J.R. Walker, D.F. Nogales, B.J. Frost, A. Thurber and A. Punnoose, *Inorganica Chimica Acta*, 377, (2011), pp. 14-19.

"Process and Apparatus Utilizing Mixed Ligand Organometallic Catalysts for in situ Growth of High Purity, Low Defect Density Carbon Nanotubes," A.F. Hepp and J.D. Harris, United States Patent: US 7,763,230 B2, July 27, 2010.

"*Chapter 6: Spray CVD of Single-Source Precursors for Chalcopyrite I-III-VI$_2$ Thin-Film Materials";* A.F. Hepp; K.K Banger; M.H.-C. Jin; J.D. Harris; J.S. McNatt; J.E. Dickman; In *Solution Processing of Inorganic Materials*; D. Mitzi, Ed.; Wiley-Interscience Publishing, 2009, pp. 157-197, ISBN: 978-0-470-40665-6.

Publications (Cont)

"Spray Chemical Vapor Deposition of Single-Source Precursors for Chalcopyrite I-III-VI_2 Thin-Film Materials", A.F. Hepp; K.K Banger, M.H.-C. Jin, J.D. Harris, J.S. McNatt, J.E. Dickman, NASA Technical Publication – 2008-214937.

"Improved Single-Source Precursors for Solar-Cell Absorbers," K.K. Banger, J.D. Harris, A.F. Hepp, *NASA Tech Briefs*, 2007, Vol. 31, No. 6, pg. 56.

"Spray CVD for Making Solar-Cell Absorber Layers," K.K. Banger, J.D. Harris, M.H-C Jin, and A.F. Hepp, *NASA Tech Briefs*, 2007, Vol. 31, No. 6, pp. 58-59.

"Single-source precursors for ternary chalcopyrite materials, and methods of making and using the same," K.K. Banger, A.F. Hepp, J.D. Harris, M.H-C Jin, S.L. Castro, United States Patent: 6,992,202, January 31, 2006.

"Growth of Multi-Walled Carbon Nanotubes by Injection CVD Using Cyclopentadienyliron Dicarbonyl Dimer and Cyclooctatetraene Iron Tricarbonyl," J.D. Harris, R.P. Raffaelle, T. Gennett, B.J. Landi and A.F. Hepp, *Material Science and Engineering B*, 2005, 116, 369-374.

"Carbon Nanotubes for Power Applications", R.P. Raffaelle, B.J. Landi, J.D. Harris, S.G. Bailey, and A.F. Hepp, *Material Science and Engineering B*, 2005, *116*, 233-243.

"$CuInS_2$ Films Deposited by Aerosol-Assisted Chemical Vapor Deposition Using Ternary Single-Source Precursors", M.H.-C. Jin, K.K. Banger, J.D. Harris, and A.F. Hepp, *Material Science and Engineering B*, 2005, *116*, 395-401.

"Synthesis, characterization and decomposition studies of tris(N,N-dibenzyldithiocarbamato)indium(III): chemical spray deposition of polycrystalline $CuInS_2$ on copper films," D.G. Hehemann, J.E Lau, J.D. Harris, M.D. Hoops, N.V. Duffy, P.E. Fanwick, M.H.-C. Jin and A.F. Hepp, *Material Science and Engineering B*, 2005, *116*, 381-389.

"Injection CVD Grown MWNTs for PEM Fuel Cells", B. J. Landi, H.J. Ruf, C.M. Schauerman, R.P. Raffaelle, J.D. Harris, and A.F. Hepp, Proceedings of the 2nd. International Energy Conversion Engineering Conference, Providence, RI, August 16-19, 2004, paper # AIAA-2004-5550.

"A New Commercializable Route for the Preparation of Single-Source Precursors for Bulk, Thin-Film, and Nanocrystallite I-III-VI Semiconductors," K.K. Banger, M.H.-C. Jin, J.D. Harris, P.E. Fanwick, and A.F. Hepp, NASA Technical Memorandum – 2004-212922

"A New Facile Route for the Preparation of Single-Source Precursors for Bulk, Thin-Film, and Nanocrystallite I-III-VI Semiconductors," K.K. Banger, M.H.-C. Jin, J.D. Harris, P.E. Fanwick, and A.F. Hepp, *Inorganic Chemistry*, 2003, *42*,7713-7715

"Growth and Characterization of Multi-Walled Carbon Nanotubes At NASA Glenn Research Center", J.D. Harris, A.F. Hepp, R.P. Raffaellec, T. Gennett, R. Vander Wal, B.J. Landi, Y.

Publications (Cont)

Luo and D.A. Scherson, Proceedings of the 1st. International Energy Conversion Engineering Conference, Portsmouth, VA, August 18-22, 2003, paper # AIAA-2003-5953.

"The Effect of Film Composition on the Texture and Grain Size of $CuInS_2$ Prepared by Spray Pyrolysis," M.H.-C. Jin, K.K. Banger, J.D. Harris and A.F. Hepp, Proceedings of the 3rd World Conference on Photovoltaic Energy Conversion, Osaka, Japan, May 11-18, 2003, paper # 2P-A8-21.

"The Effect of Film Composition on the Texture and Grain Size of $CuInS_2$ Prepared by Chemical Spray Pyrolysis," M.H.-C. Jin, K.K. Banger, J.D. Harris and A.F. Hepp, *Mat. Res. Soc. Symp. Proc.* 2003, *763*, B8.23.1- B8.23.5.

"Single source precursors for fabrication of I-III-VI_2 thin-film solar cells via spray CVD," J.A. Hollingsworth, K.K. Banger, M.H-C. Jin, J.D. Harris, J.E. Cowen, E.W. Bohannan, J.A. Switzer, W.E. Buhro, A.F. Hepp, *Thin Solid Films*, 2003, *431-432*, 63-67.

"Characterization of $CuInS_2$ Films Prepared by Atmospheric Pressure Spray Chemical Vapor Deposition," J.D. Harris, K.K. Banger, D.A. Scheiman, M.A. Smith, M.H. Jin and A.F. Hepp, *Material Science and Engineering*, 2003, *B98*, 150-155.

"Novel Route to Transition Metal Isothiocyanate Complexes Using Metal Powders and Thiourea," J.D. Harris, W.E. Eckles, A.F. Hepp, S.A. Duraj, D.G. Hehemann, P.E. Fanwick and J. Richardson, NASA Technical Publication – 2003-211890.

"Ternary Single Source Precursors for Polycrystalline Thin-film Solar Cells", K.K. Banger, J. Hollingsworth, J.D. Harris, J.E. Cowen, W.E. Buhro, A.F. Hepp, *Appl. Organometal. Chem*., 2002, *16*, 617-627.

"Synthesis and Characterization of Transition Metal Isothiocyanate Complexes Prepared from Metal Powders and Thiourea," J.D. Harris, W.E. Eckles, A.F. Hepp, S.A. Duraj, P.E. Fanwick, *Inorganica Chimica Acta*, 2002, 338, 99-104.

"Thin-Film Organic-Based Solar Cells For Space Power," S.G. Bailey, J.D. Harris, A.F. Hepp, E.J. Anglin, R.P. Raffaelle, H.R. Clark, Jr., S.T.P. Gardner and S-S. Sun, Proceedings of the 37th Intersociety Energy Conversion Engineering Conference, Washington, DC, July 28-August 2, 2002, paper # 20154.

"Chemical Vapor Deposition for Ultra-Lightweight Thin-Film Solar Arrays for Space," A.F. Hepp, R.P. Raffaelle, K.K. Banger, M.H. Jin, J.E. Lau, J.D. Harris, J.E. Cowen, and S.A. Duraj, Proceedings of the 37th Intersociety Energy Conversion Engineering Conference, Washington, DC, July 28-August 2, 2002, paper # 20156.

"Single Source Precursors for Thin Film Solar Cells," K.K. Banger, J.A. Hollingsworth, J.D. Harris, J.E. Cowen, W.E. Buhro and A.F. Hepp, NASA Technical Memorandum – 2002-211496.

Publications (Cont)

"Thin Film $CuInS_2$ Prepared by Spray Pyrolysis with Single-Source Precursors," M.H. Jin, K.K. Banger, J.D. Harris, J.E. Cowen, and A.F. Hepp, Proceedings of the 29th IEEE Photovoltaic Specialists Conference, New Orleans, LA, May 20-24, 2002.

"Space Environmental Testing of Dye-Sensitized Solar Cells," J.D. Harris, E.J. Anglin, A.F. Hepp, S.G. Bailey, D.A. Scheiman, S.L. Castro, Proceedings of the Sixth European Space Power Conference, Porto, Portugal, May 6-10, 2002, pp. 629-632.

"Facile Modulation of Single Source Precursors: The Synthesis and Characterization of The First Liquid Single Source Precursors for Deposition of Ternary Chalcopyrite Materials," K.K. Banger, J.D. Harris, J.C. Cowen, A.F. Hepp, *Thin Solid Films*, 2002, *403-404*, 390-395.

"Atmospheric Pressure Spray Chemical Vapor Deposited $CuInS_2$ Thin Films For Photovoltaic Applications," J.D. Harris, R.P. Raffaelle, K.K. Banger, A.F. Hepp, Proceedings of the 17th Space Photovoltaic Research Conference, Brookpark, OH, September 11-13, 2001.

"Dissolution of Metal Powders by Thiourea: A Novel Route to Transition Metal Isothiocyanate Complexes," J.D. Harris, W.E. Eckles, A.F. Hepp, S.A. Duraj, P.E. Fanwick, J. Richardson, and E.M. Gordon, *Materials and Design*, 2001, *22*, 625-634.

"Optical and Structural Characterization of Copper Indium Disulfide Thin Films," D.O. Henderson, R. Mu, A. Ueda, M.H. Wu, E.M. Gordan, Y.S. Tung, M. Huang, J. Keay, L.C. Feldman, J.A. Hollingsworth, W.E. Buhro, J.D. Harris, A.F. Hepp, R.P. Raffaelle, *Materials and Design*, 2001, *22*, 585-589.

"Using Single Source Precursors and Spray Chemical Vapor Deposition to Grow Thin-Film $CuInS_2$," J.D. Harris, D.G. Hehemann, J.E. Cowen, A.F. Hepp, R.P. Raffaelle, J.A. Hollingsworth, Proceedings of the 28th IEEE Photovoltaic Specialists Conference, Anchorage, AK, September 17-22, 2000, pp. 563-566.

"Integrated Solar Power Systems," R.P. Raffaelle, J. Underwood, D. Scheiman, J.E. Cowen, P. Jenkins, A.F. Hepp, J.D. Harris, D.M. Wilt, Proceedings of the 28th IEEE Photovoltaic Specialists Conference, Anchorage, AK, September 17-22, 2000, pp. 1370-1373.

"Integrated Thin-Film Solar Power System," R.P. Raffaelle, J.D. Harris, D. Hehemann, D. Scheiman, G. Rybicki, and A.F. Hepp, Proceedings of the 35th Intersociety Energy Conversion Engineering Conference, Las Vegas, NV, July 24-28, 2000.

"A Facile Route to Thin Film Solid State Lithium Microelectronic Batteries," R.P. Raffaelle, J.D. Harris, D. Hehemann, D. Scheiman, G. Rybicki, and A.F. Hepp, *J. Power Sources*, 2000, *89*, 52-55.

"Thin-Film Microelectronic Solar Power Systems," J.D. Harris, R.P. Raffaelle, A.F. Hepp, G. Rybicki, D. Scheiman and J.E. Cowen, Proceedings of NanoSpace 2000 – Advancing the Human Frontier, League City, TX January 23 – 28, 2000.

Publications (Cont)

"Wet-Chemical Synthesis of Thin-Film Solar Cells," R.P. Raffaelle, W. Junek, J. Gorse, T. Thompson, J.D. Harris, J. Cowen, D. Hehemann, G. Rybicki, and A.F. Hepp, *Mat. Res. Soc. Symp. Proc.*, 2000, *606*, 155-162.

"Synthesis of Thin Film Lithium-ion Battery Components Using the Spray Decomposition Approach," K.S. Weil, P.N. Kumta, J.D. Harris, and A.F. Hepp, *Mat. Res. Soc. Symp. Proc.*, 1999, *551*, 91-100.

"A Comprehensive Characterization of Copper Indium Disulfide," R. Mu, D.O. Henderson, A. Ueda, M.H. Wu, J.A. Bennett, M.A.M. Paliza, M.B. Huang, J. Keay, L.C. Feldman, K.C.

Kwiatkowski, C.M. Lukehart, J.A. Hollingsworth, W.E. Buhro, J.D. Harris, E.M. Gordan, A.F. Hepp, Proceedings of the SPIE Conference on Solar Optical Materials XVI, Denver, CO, July 1999, SPIE Vol. 3789, pp. 116-124.

"Multinuclear Magnetic Resonance Spectroscopy of Centered Zirconium Halide Clusters," J. D. Harris, and T. Hughbanks, *J. Amer. Chem. Soc.*, 1997, *119*, 9449-9459.

"Synthesis and Characterization of the Isocyanide Ligated Centered Zirconium Halide Cluster $[(Zr_6Be)Cl_{12}(CNXyl)_6]$," J. D. Harris, and T. Hughbanks, *J. Cluster Sci.*, 1997, *8*, 521-531.

"Mass spectrometric investigations of aluminum oxide reduction by gaseous aluminum carbides in electrothermal atomization," J.A. Holcombe, D.L. Styris, and J.D. Harris, *Spectrachimica Acta*, 1991, *46B*, 629-639.

Selected Presentations

"$Zn_{1-x}Ni_xO$ nanoparticles are effective photocatalysts and exhibit cytotoxic properties," E.G. Ellison, C. Kincheloe, C. Leach, K. Cornell and J.D. Harris, 32nd Murdock College Science Research Conference, Vancouver, WA, November 10-11, 2023.

"$Zn_{1-x}Ni_xO$ nanoparticles are effective photocatalysts and exhibit cytotoxic properties," C. Kincheloe, E.G. Ellison, and J.D. Harris, 2023 Idaho INBRE Conference, Moscow, ID, July 25-26, 2023.

"$Zn_{1-x}Ni_xO$ nanoparticles are effective photocatalysts and exhibit antibacterial properties," E.G. Ellison, C. Kincheloe, C. Leach, K. Cornell and J.D. Harris, 2023 Idaho INBRE Conference, Moscow, ID, July 25-26, 2023.

"Synthesis and characterization of $Zn_{0.85}Ni_{0.15}O(CA)_x$ nanoparticles with varying amounts of cinnamic acid," S. Amezcua-Hernandez, E. Ellison, C. Kincheloe, and J.D. Harris, Idaho Conference on Undergraduate Research, Boise, ID, July 20, 2023.

"Synthesis and characterization of $Zn_{1-x}Ni_xO$ nanoparticles with cinnamic acid for antibiotics and photocatalysis," E.G. Ellison, C. Leach, K. Cornell and J.D. Harris, 2022 Idaho INBRE Conference, Moscow, ID, August 1-3, 2022.

Selected Presentations (Cont)

"Synthesis and characterization of ZnO(Ampicillin)$_x$ nanoparticles for photocatalysis and antibiotics applications," L. Wilhelm, M. Bowers, and J.D. Harris, 2022 Idaho INBRE Conference, Moscow, ID, August 1-3, 2022.

"Zinc Oxide Nanoparticles Demonstrating Antimicrobial Inhibition," C. Leach, J.D. Harris, and K. Cornell, Idaho Conference on Undergraduate Research, Boise, ID, July 20-21, 2022.

"Green synthesis of ZnO nanoparticles using plant extracts for enhanced antibacterial and photocatalytic properties", J.D. Harris, E.A. Wade, Z.D. Ledvina, E.G. Ellison, S.M. Hubbard, and J.C. Nixon, Pacifichem 2021, Honolulu, HI, December 16-21, 2021.

"Synthesis and antibacterial Properties of ZnO nanoparticles from extracts of *Hydrastis canadensis*, *Plantago major*, and *Lavandula* x *intermedia*," E.A. Wade, Z.D. Ledvina, E.G. Ellison, J.C. Nixon, and J.D. Harris, 2021 Idaho INBRE Conference, Moscow, ID, July 26-28, 2021.

"Synthesis and antibacterial properties of ZnO nanoparticles from *Hydrastis canadensis* extract," E.G. Ellison, E.A. Wade, Z.D. Ledvina, J.C. Nixon, and J.D. Harris, Idaho Conference on Undergraduate Research, Boise, ID, July 21-23, 2021.

"Synthesis and Characterization of ZnO Nanoparticles from Extracts of *Allium sativum* and *Hydrastis canadensis*," E.A. Wade, C.J. Massie, D.F. Harris, and J.D. Harris, 28th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Vancouver, WA, November 6-7, 2020.

"Synthesis and Characterization of ZnO Nanoparticles from Extracts of *Allium sativum* and *Hydrastis canadensis*," E.A. Wade, C.J. Massie, D.F. Harris, and J.D. Harris, Idaho Conference on Undergraduate Research, Boise, ID, July 23-24, 2020.

"Synthesis and characterization of ZnO nanoparticles and their use to photocatalyze malachite green", J.D. Harris, C.C. Pena, A.E. Harris, J.E. Cowen, (Paper # INOR ???, Spring 2020 ACS National Meeting & Expo, Philadelphia, PA) March 22-26, 2020.

"Enhancement of ZnO antibacterial properties by incorporating plant extracts", C.J. Massie, E.A. Wade, and J.D. Harris, (Paper # INOR ???, Spring 2020 ACS National Meeting & Expo, Philadelphia, PA) March 22-26, 2020.

"Enhancement of ZnO antibacterial properties by incorporating plant extracts", E. Wade, C. Massie and J.D. Harris, 27th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Vancouver, WA, November 8-9, 2019.

"Enhancement of ZnO antibacterial properties by incorporating plant extracts", C. Massie, E. Wade, and J.D. Harris, 2019 Idaho INBRE Conference, Moscow, ID, July 30-31 2019.

"Comparative toxicity of ZnO nanoparticles synthesized using different amines," C.C. Pena, K.A. Cornell, J.E. Cowen, and J.D. Harris, 61st Idaho Academy of Science and Engineering Meeting and Symposium, Meridian, ID, April 12-13, 2019.

Selected Presentations (Cont)

"ZnO nanoparticle synthesis, characterization, and use to photocatalyze malachite green," A.E. Harris, J.D. Harris, C.C. Pena, and J.E. Cowen, 61st Idaho Academy of Science and Engineering Meeting and Symposium, Meridian, ID, April 12-13, 2019.

"NiO nanoparticle synthesis, characterization, and toxicology," P.T. Gwin, C.C. Pena, J.D. Harris, J.E. Cowen, 26th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Vancouver, WA, November 9-10, 2018.

"Self-assembly of PS-b-PEO films as a shadow mask for GaAs nanowire deposition," L.R. Steiner, S.C. Hall, J.D. Harris, 26th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Vancouver, WA, November 9-10, 2018.

"Synthesis and characterization of $Pd(SCN)_2(4\text{-mepy})_2$," N.L. Paul, K.E. Djernes, J.D Harris, 26th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Vancouver, WA, November 9-10, 2018.

"Comparative toxicity of ZnO nanoparticles synthesized using different amines," C.C. Pena, K.A. Cornell, J.E. Cowen, and J.D. Harris, (Paper # INOR 744, 256th ACS National Meeting, Boston, MA) August 19-23, 2018.

"Synthesis and characterization of ZnO nanoparticles and their use to photocatalyze the degradation of malachite green," A.E. Harris, J.D. Harris, C.C. Pena, and J.E. Cowen, (Paper # INOR 724, 256th American Chemical Society National Meeting, Boston, MA) August 19-23, 2018.

"NiO nanoparticle synthesis, characterization, and toxicology", P.T. Gwin, C.C. Pena, J.D. Harris, J.E. Cowen, 2018 Idaho INBRE Conference, Moscow, ID, July 31-Aug. 1, 2018.

"Self-assembly of PS-b-PEO films as a shadow mask for GaAs nanowire deposition," L.R. Steiner, S.C. Hall, A.J. Christy, and J.D. Harris, (Paper # INOR 834, 255th ACS National Meeting, New Orleans, LA) March 18-22, 2018.

"NiO nanoparticle synthesis, characterization, and toxicology," P.T. Gwin, C.C. Pena, K.A. Cornell, J.E. Cowen, and J.D. Harris, (Paper # INOR 804, 255th ACS National Meeting, New Orleans, LA) March 18-22, 2018.

"Comparative toxicity of ZnO nanoparticles synthesized using different amines," C.C. Pena, K.A. Cornell, J.E. Cowen, and J.D. Harris, (Paper # INOR 800, 255th American Chemical Society National Meeting, New Orleans, LA) March 18-22, 2018.

"Synthesis and characterization of ZnO nanoparticles and their use as a photocatalyst," J.D. Harris, C.C. Pena, A.E. Harris, and J.E. Cowen, (Paper # INOR 799, 255th ACS National Meeting, New Orleans, LA) March 18-22, 2018.

"Self patterning of PS-*b*-PEO as a shadow mask for quantum nanowire deposition," L.R. Steiner, S.C. Hall, J.D. Harris, 25th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Spokane, WA, November 10-11, 2017.

Selected Presentations (Cont)

"NiO nanoparticle synthesis, characterization, and toxicology," P.T. Gwin, C.C. Pena, J.D. Harris, J.E. Cowen, 25th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Spokane, WA, November 10-11, 2017.

"Use of ZnO nanoparticles to photodegrade azo dye Janus Green B," A.W. Silva, H. Anderson, C.C. Pena, J.E. Cowen, J.J. Pak, J. Croteau, D. Butt, and J.D. Harris, 25th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Spokane, WA, November 10-11, 2017.

"NiO nanoparticle synthesis, characterization, and toxicology", P.T. Gwin, C.C. Pena, J.D. Harris, J.E. Cowen, 2017 Idaho INBRE Conference, Aug. 1-2, 2017.

"Nanostructured Lithography through Self Assembly of Diblock Copolymers," L.R. Steiner, A.J. Christy, J.D. Harris, D. Estrada, (Paper # CHED 1748, 253rd ACS National Meeting, San Francisco, CA) April 2-6, 2017.

"Effect of ZnO nanoparticle morphology on photodegradation of Janus Green B azo dye", H. Anderson, C.C. Pena, J.E. Cowen, J.J. Pak, J. Croteau, D. Butt, and J.D. Harris, (Paper # CHED 1262, 253rd ACS National Meeting, San Francisco, CA) April 2-6, 2017.

"Neurodevelopmental toxicity of low concentration silver nanoparticles in embryonic zebrafish (*Danio rerio*)", T. Hemphill, V. Nicolae, A. Latta, S. Robertson, R. Manteca, C.C. Pena, J.J. Pak, M.A. Thomas, and J.D. Harris, (Paper # CHED 1259, 253rd ACS National Meeting, San Francisco, CA) April 2-6, 2017.

"Nanostructured Lithography through Self Assembly of Diblock Copolymers," L.R. Steiner, A.J. Christy, J.D. Harris, D. Estrada, 25th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Spokane, WA, November 4-5, 2016.

"Effect of ZnO nanoparticle morphology on photodegradation of Janus Green B azo dye", H. Anderson, C.C. Pena, J.E. Cowen, J.J. Pak, J. Croteau, D. Butt, and J.D. Harris, 25th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Spokane, WA, November 4-5, 2016.

"Neurodevelopmental toxicity of low concentration silver nanoparticles in embryonic zebrafish (*Danio rerio*)", T. Hemphill, V. Nicolae, A. Latta, S. Robertson, R. Manteca, C.C. Pena, J.J. Pak, M.A. Thomas, and J.D. Harris, 25th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Spokane, WA, November 4-5, 2016.

"Environmental toxicology & health implications of nanomaterials", J.D. Harris, 2016 Idaho INBRE Conference, Aug. 1-3, 2016.

"Effect of ZnO nanoparticle morphology on photodegradation of Janus Green B azo dye", H. Anderson, C.C. Pena, J.E. Cowen, J.J. Pak, J. Croteau, and J.D. Harris, 2016 Idaho INBRE Conference, Aug. 1-3, 2016.

Selected Presentations (Cont)

"Neurodevelopmental toxicity of low concentration silver nanoparticles in embryonic zebrafish (*Danio rerio*)", T. Hemphill, V. Nicolae, A. Latta, S. Robertson, R. Manteca, C.C. Pena, J.J. Pak, M.A. Thomas, and J.D. Harris, 2016 Idaho INBRE Conference, Aug. 1-3, 2016.

"Nanostructured polymer lithography for electronic applications," A.J. Christy, N. McKibben, J.D. Harris, D. Estrada, 2016 IEEE Workshop on Microelectronics and Electron Devices, Boise, ID, April 15, 2016.

"Influence of ZnO particle size and morphology on the photocatalytic degradation of malachite green," J.D. Harris, A.E. Harris, C. Pena, S. Bryant, A.J. Christy, J. Cowen and J. Pak, (Paper # INOR 933, 251th ACS National Meeting, San Diego, CA) March 12-17, 2016.

"Nanostructured polymer lithography for electronic applications," A.J. Christy, J.D. Harris, and D. Estrada, (Paper # PMSE 295, 251th ACS National Meeting, San Diego, CA) March 12-17, 2016.

"Effect of ZnO morphology on the photodegradation of malachite green oxalate," S. Bryant, K. Laughlin, C. Pena, and J.D. Harris, 24nd Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Vancouver, WA, November 6-7, 2015.

"Nanostructured polymer lithography for photovoltaic applications," A.J. Christy, N. McKibben, J.D. Harris, D. Estrada, 24nd Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Vancouver, WA, November 6-7, 2015.

"Effect of ZnO morphology on the photodegradation of malachite green oxalate," A.J. Christy, S. Bryant, K. Laughlin, N. McKibben, and J.D. Harris, 4th Biennial Western Regional IDeA Scientific Conference, Cour d'Alene, ID, October 12-14, 2015.

"Effect of ZnO morphology on the photodegradation of malachite green oxalate," S. Bryant, K. Laughlin, N. McKibben, and J.D. Harris, 70th ACS Northwest Regional Meeting, Pocatello, ID, June 21-24, 2015.

"Nanostructured polymer lithography for photovoltaic applications," A.J. Christy, N. McKibben, J.D. Harris, D. Estrada, 70th ACS Northwest Regional Meeting, Pocatello, ID, June 21-24, 2015.

"Effect of ZnO morphology on the photodegradation of malachite green oxalate," S. Bryant, K. Laughlin, N. McKibben, and J.D. Harris, (Paper # CHED 901, 249th ACS National Meeting, Denver, CO) March 22-26, 2015.

"Nanostructured polymer lithography for photovoltaic applications," A.J. Christy, N. McKibben, J.D. Harris, D. Estrada, (Paper # CHED 1053, 249th ACS National Meeting, Denver, CO) March 22-26, 2015.

Selected Presentations (Cont)

"Nanostructured polymer lithography for photovoltaic applications," A.J. Christy, N. McKibben, J.D. Harris, D. Estrada, 2015 IEEE Workshop on Microelectronics and Electron Devices, Boise, ID, March 20, 2015.

"Effect of ZnO Morphology on the Photodegradation of Malachite Green Oxalate," S. Bryant, K. Laughlin, and J.D. Harris, 23nd Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Vancouver, WA, November 14-15, 2014.

"Nanostructured Lithography Through Self Assembly of Diblock Copolymers," N. McKibben, A.J. Christy, J.D. Harris, D. Estrada, 23nd Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Vancouver, WA, November 14-15, 2014.

"Nanostructured Polymer Lithography for Photovoltaic Applications," N. McKibben, A.J. Christy, J.D. Harris, D. Estrada, J. McNatt, 23rd Space Photovoltaic Research and Technology Conference, Cleveland, OH, October 28-30, 2014.

"Effect of ZnO Morphology on the Photodegradation of Malachite Green Oxalate," S. Bryant, K. Laughlin, and J.D. Harris, Idaho Conference on Undergraduate Research, Boise, ID, July 30-31, 2014.

"Nanostructured Polymer Lithography for Photovoltaic Applications," N. McKibben, J.D. Harris, J. McNatt, 2014 IEEE Workshop on Microelectronics and Electron Devices, Boise, ID, April 18, 2014.

"Nanostructured Polymer Lithography for Photovoltaic Applications," N. McKibben, J.D. Harris, J. McNatt, 22nd Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Portland, OR, November 8-9, 2013.

"Nanostructured Polymer Lithography for Photovoltaic Applications," N. McKibben, J.D. Harris, J. McNatt, 2013 NASA Glenn Research Center Summer Student Internship Presentation, Cleveland, OH, August 5, 2013.

"Nanostructured Polymer Lithography for Photovoltaic Applications," J.D. Harris, N. McKibben, J. McNatt, 2013 NASA Glenn Research Center Summer Faculty Fellowship Presentation, Cleveland, OH, August 5, 2013.

"Effect of ZnO Size & Morphology on the Photodegradation of Organic Dyes," D.S. Stout, A.W. Rusch, K.A. Nogales, K. Goettsche, J.D. Harris, W.B. Knowlton, A. Punnoose, and S.M. Hubbard, 2013 IEEE Workshop on Microelectronics and Electron Devices, Boise, ID, April 12, 2013.

"Effect of ZnO morphology on the photodegradation of phenol red," A.W. Rusch, K.R. Nogales, K. Goettsche, J.D. Harris, P. Walker, W.B. Knowlton, A. Thurber , A. Punnoose, S. Christopher and S.M. Hubbard, 21st Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Walla Walla, WA, October 26-27, 2012.

Selected Presentations (Cont)

"The use of amines to control ZnO morphology," K. Goettsche, C.E. Larson, W. Hanson, J.D. Harris, A. Thurber, P. Walker, A. Punnoose, W.B. Knowlton, S. Christopher and S.M. Hubbard, 67th ACS Northwest Regional Meeting, Boise, ID, June 24-27, 2012.

"Synthesis and characterization of $Zn(acetate)_2(amine)_x$ compounds and their use as precursors to ZnO," J.D. Harris, A.R. Snyder, J.R. Walker, A. Thurber, P. Walker, W.B. Knowlton, A. Punnoose, S. Christopher and S.M. Hubbard, 67th ACS Northwest Regional Meeting, Boise, ID) June 24-27, 2012.

"The use of amines to control ZnO morphology," K. Goettsche, C.E. Larson, W. Hanson, J.D. Harris, A. Thurber, P. Walker, A. Punnoose, W.B. Knowlton, S. Christopher and S.M. Hubbard, 2012 IEEE Workshop on Microelectronics and Electron Devices, Boise, ID, April 20, 2012.

"Synthesis and characterization of $Zn(acetate)_2(amine)_x$ compounds and their use as precursors to ZnO," J.D. Harris, A.R. Snyder, J.R. Walker, A. Thurber, P. Walker, W.B. Knowlton, A. Punnoose, S. Christopher and S.M. Hubbard, 2012 IEEE Workshop on Microelectronics and Electron Devices, Boise, ID, April 20, 2012.

"Synthesis and characterization of $Zn(acetate)_2(amine)_x$ compounds and their use as precursors to ZnO," J.D. Harris, A.R. Snyder, J.R. Walker, A. Thurber, P. Walker, W.B. Knowlton, A. Punnoose and B.J. Frost, (Paper # INOR 323, 243th ACS National Meeting, San Diego, CA) March 25-29, 2012.

"Synthesis and characterization of $Zn_{1-x}Co_xO$ using $Zn(acetate)_2(amine)_x$ precursors," L.A. Smith, J.D. Harris, A. Punnoose, A. Thurber, W.B. Knowlton, P. Walker, and B.J. Frost, 20th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Seattle, WA, November 11-12, 2011.

"Synthesis and characterization of $Zn(acetate)_2(amine)_x$ compounds and their use as precursors to ZnO," J.R. Walker, J.D. Harris, A. Punnoose, A. Thurber, W.B. Knowlton, P. Walker, and B.J. Frost, 20th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Seattle, WA, November 11-12, 2011.

"The use of amines to control ZnO morphology," K. Goettsche, J.D. Harris, A. Punnoose, A. Thurber, W.B. Knowlton, P. Walker, S. Christopher and S.M. Hubbard, 20th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Seattle, WA, November 11-12, 2011.

"Synthesis and characterization of cobalt doped ZnO powders and films," L.A. Smith, T. Fereday, J.D. Harris, A. Thurber, J. Brotherton, P. Walker, W.B. Knowlton, A. Punnoose and B.J. Frost, (53rd Annual Symposium of the Idaho Academy of Science, Caldwell, ID) March 31 – April 2, 2011.

Selected Presentations (Cont)

"Modification of ZnO crystal morphology by the addition of amines," J.R. Walker, J.D. Harris, A.R. Snyder, A. Thurber, P. Walker, J. Brotherton, W.B. Knowlton, A. Punnoose and B.J. Frost, (53rd Annual Symposium of the Idaho Academy of Science, Caldwell, ID) March 31 – April 2, 2011.

"Synthesis and characterization of cobalt doped ZnO powders and films," L.A. Smith, T. Fereday, J.D. Harris, A. Thurber, J. Brotherton, W.B. Knowlton, A. Punnoose and B.J. Frost, (Paper # INOR 667, 241th ACS National Meeting, Anaheim, CA) March 27-31, 2011.

"Modification of ZnO crystal morphology by the addition of amines," J.D. Harris, A.R. Snyder, C.E. Larson, J.R. Walker, A. Thurber, P. Walker, J. Brotherton, W.B. Knowlton, A. Punnoose and B.J. Frost, (Paper # INOR 665, 241th ACS National Meeting, Anaheim, CA) March 27-31, 2011.

"Synthesis and characterization of cobalt doped ZnO," L.A. Smith, J.D. Harris, T.R. Fereday, A. Punnoose, A. Thurber, W.B. Knowlton, B. Beausoleil, P. Walker, and B.J. Frost, 19th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, McMinnville, OR, November 12-13, 2010.

"Working toward the synthesis of phosphorous-doped ZnO from single source chemical precursors," W. Hanson, J.D. Harris, L.A. Smith, A. Snyder, A. Thurber, W.B. Knowlton, A. Punnoose, and B. Beausoleil, 19th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, McMinnville, OR, November 12-13, 2010.

"Synthesis and characterization of cobalt doped ZnO," L.A. Smith, T.R. Fereday, J.D. Harris, A. Thurber, J. Brotherton, W.B. Knowlton, A. Punnoose and B.J. Frost, (Paper # INOR 755, 240th ACS National Meeting, Boston, MA) August 22-26, 2010.

"Synthesis and characterization of transition metal-doped ZnO," L.A. Smith, T.R. Fereday, J.D. Harris, J. Brotherton, A. Thurber, W.B. Knowlton, A. Punnoose and B.J. Frost, (Paper # CHED 782, 239th ACS National Meeting, San Francisco, CA) March 21-25, 2010.

"Synthesis and characterization of ZnO sol-gel powders," A.R. Snyder, L.A. Smith, T.R. Fereday, J.D. Harris, A. Thurber, J. Brotherton, P. Walker, W.B. Knowlton, and A. Punnoose, (Paper # CHED 783, 239th ACS National Meeting, San Francisco, CA) March 21-25, 2010.

"Growth and characterization of ZnO thin films,", T.R. Fereday, L.A. Smith, A.R. Snyder, J.D. Harris, A. Thurber, J. Brotherton, W.B. Knowlton, A. Punnoose and B.J. Frost, (Paper # CHED 784, 239th ACS National Meeting, San Francisco, CA) March 21-25, 2010.

"Synthesis and characterization of ZnO from single source precursors," A.R. Snyder, L.A. Smith, T.R. Fereday, J.D. Harris, W.B. Knowlton and A. Thurber, 18th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Spokane, WA, October 30-31, 2009.

Selected Presentations (Cont)

"Synthesis and characterization of p-type ZnO from single source precursors," J.D Harris, J.S. Hyslop, J.L. Young, A. Punnoose, S.M. Hubbard and B.J. Frost, 64nd ACS Northwest Regional Meeting, Tacoma, WA, June 28 – July 1, 2009.

"Synthesis and characterization of p-type ZnO films from single source precursors," J.S. Hyslop, J.L. Young and J.D Harris, 17th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Tacoma, WA, November 7-8, 2008.

"Chemical vapor deposited and template synthesized carbon nanotubes for polymer solar cells," J.L. Young, J.D. Harris and R.P. Raffaelle, 50th Annual Meeting and Symposium of the Idaho Academy of Science, Boise, ID, March 27-29, 2008.

"Use of $Zn(acetate)_2(amine)_x$ compounds as precursors to N-doped ZnO," J.S. Hyslop and J.D Harris, 16th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Salem, OR, November 2-3, 2007.

"Inorganic research at Northwest Nazarene University," J.D. Harris, 2007 NSF REU Minisymposium, University of Nevada, Reno, Reno, NV, August 15, 2007.

"Integration of NMR Spectroscopy throughout the undergraduate chemistry curriculum," D.F. Nogales, D.T. Anstine, J.D. Harris and J. Chase, Paper # 32, 62nd ACS Northwest Regional Meeting, Boise, ID, June 17-20, 2007

"Chemical vapor deposited and template synthesized carbon nanotubes for polymer solar cells," J.L. Young, J.D. Harris and R.P. Raffaelle, Paper # 46, 62nd ACS Northwest Regional Meeting, Boise, ID, June 17-20, 2007

"Synthesis and characterization of new chemical precursors for p-type metal oxide semiconductors," J.S. Hyslop, J.L. Young, J.D. Harris and B.J. Frost, Paper # 49, 62nd ACS Northwest Regional Meeting, Boise, ID, June 17-20, 2007

"Integration of NMR Spectroscopy throughout the undergraduate chemistry curriculum," D.F. Nogales, D.T. Anstine, J.D. Harris and J. Chase, (Paper # CHED 185, 233rd ACS National Meeting, Chicago, IL) March 25-29, 2007.

"Chemical vapor deposited and template synthesized carbon nanotubes for polymer solar cells," J.L. Young, J.D. Harris and R.P. Raffaelle, (Paper # CHED 1186, 233rd ACS National Meeting, Chicago, IL) March 25-29, 2007.

"Synthesis and characterization of new chemical precursors for p-type metal oxide semiconductors," J.S. Hyslop, J.L. Young, J.D. Harris and B.J. Frost, (Paper # CHED 1256, 233rd ACS National Meeting, Chicago, IL) March 25-29, 2007.

"New Chemical Precursors for p-type Metal Oxide Semiconductors," J.S. Hyslop, J.L. Young, and J.D Harris, 15th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Portland, OR, October 20-21, 2006.

Selected Presentations (Cont)

"Chemical Vapor Deposited Carbon nanotubes for Polymer Solar Cells," J.D. Harris, J.L. Young, K.E. Djernes, J.A. Benjamin, R.P. Raffaelle, and B.J. Frost, Paper # 98**,** 61st ACS Northwest Regional Meeting, Reno, NV, June 25-28, 2006.

"New Catalysts for Carbon Nanotube-based Polymer Solar Cells," K.E. Djernes, J.A. Benjamin, J.D Harris, 14th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Nampa, ID, November 11-12, 2005.

"New Catalyst Precursors for Carbon Nanotube Growth," J.A. Benjamin, J.D Harris, 47th Annual Meeting and Symposium of the Idaho Academy of Science, Nampa, ID, April 7-9, 2005.

"New Catalyst Precursors for Carbon Nanotube Growth," J.A. Benjamin, J.D Harris, 13th Regional Conference on Undergraduate Research of the Murdock College Science Research Program, Portland, OR, November 12-13, 2004.

"Optimization of Atmospheric Pressure Spray Chemical Vapor Deposited Thin Films of $CuInS_2$ to Achieve Higher Efficiency Solar Cells on Polymer Substrates," J.D. Harris, 3rd NASA Idaho EPSCoR Annual Meeting, Moscow, ID, October 26, 2004.

"Photovoltaic Applications of Atmospheric Pressure Spray Chemical Vapor Deposited $CuInS_2$ Films," J.D. Harris, K.K. Banger, D.A. Scheiman, M.A. Smith, A.F. Hepp, (Paper # 629, 202nd Meeting of the Electrochemical Society, Salt Lake City, UT) October 20-25, 2002.

"Atmospheric Pressure Spray Chemical Vapor Deposited $CuInS_2$ Thin Films For Photovoltaic Applications," J.D. Harris, R.P. Raffaelle, K.K. Banger, A.F. Hepp, 17th Space Photovoltaic Research Conference, Brookpark, OH, September 11-13, 2001.

"Thin-film Microelectronic Solar Power Systems," J.D. Harris, A.F. Hepp, D. Scheiman and R.P. Raffaelle, (Paper # 361, 222nd ACS National Meeting, Chicago, IL) August 26-30, 2001.

"Facile Modulation and Preparation of Single-Source Precursors for Low-Temperature Deposition of Ternary Chalcopyrite Materials," K.K. Banger, J. Cowen, J.D. Harris, R. McClarnon, A. Riga, S. Duraj, A.F. Hepp, (Paper # 367, 222nd ACS National Meeting, Chicago, IL) August 26-30, 2001.

"Using Single Source Precursors and Spray Chemical Vapor Deposition to Grow Thin-Film $CuInS_2$," J.D. Harris, D.G. Hehemann, J.E. Cowen, A.F. Hepp, R.P. Raffaelle, J.A. Hollingsworth, (28th IEEE Photovoltaic Specialists Conference Anchorage, AK) September 17-22, 2000.

"Synthetic and Structural Studies of Indium and Gallium Compounds," A.F. Hepp, J.D. Harris and S.A. Duraj, (ACS Cleveland Section, Meeting in Miniature. Berea, OH) March 2000.

"Thin-Film Microelectronic Solar Power Systems," A.F. Hepp, G. Rybicki, J.D. Harris, D. Scheiman and R.P. Raffaelle, (NanoSpace 2000 – Advancing the Human Frontier, League City, TX) January 23 – 28, 2000.

Selected Presentations (Cont)

"NMR and Other Techniques for Understanding Zirconium Halide Clusters, Inside and Out," J. D. Harris and T. Hughbanks, (213th ACS National Meeting. San Francisco, CA) April 1997.

"NMR and Other Techniques for Understanding Zirconium Halide Clusters, Inside and Out," J. D. Harris and T. Hughbanks, (Industry-University Cooperative Chemistry Program. College Station, TX) October 1996.

"Ligand Exchange Chemistry of Centered Octahedral Zirconium Halide Clusters," J. D. Harris and T. Hughbanks, (211th ACS National Meeting. New Orleans, LA) March 1996.

Research Grant Awards as Principal Investigator: Awards Totaling $2,494,796

Idaho INBRE Summer Research Mentor – "Enhancing ZnO antibacterial properties by incorporating plant extracts," $44,800, submitted 1/28/2021, declined.

Idaho INBRE Summer Research Mentor – "Enhancement of ZnO antibacterial properties by incorporation of plant extracts," $89,600, 05/01/19 – 04/30/21.

NIH: "Novel nanoparticles for antibiotic and chemotherapeutic applications," $386,426, submitted 10/25/2018, declined.

M.J. Murdock Charitable Trust, "Understanding how synthesis conditions, size, shape and surface ligands alter the toxicity of zinc oxide and copper indium disulfide nanoparticles in cancer cells and bacteria," $60,000, submitted 10/1/2018, declined.

NASA Idaho Space Grant Consortium Collaboration Grant, "Travel to NASA Glenn Research Center", $3,654, submitted 3/7/2018, declined.

NIH: "Novel nanoparticles for antibiotic and chemotherapeutic applications," $386,426, submitted 2/26/2018, declined.

NASA Idaho Space Grant Consortium Collaboration Grant, "Travel to NASA Glenn Research Center", $3,247, 05/01/17 – 10/15/17.

NIH: "Environmental toxicology and human health implications of nanoparticles," $364,334, submitted 10/15/2016, declined.

NASA Idaho Space Grant Consortium Crosscutting Strategy Grant: "ISGC Crosscutting Project: Nanostructured Polymer Lithography for Photovoltaic Deposition Template," $10,000, submitted 10/10/2016, declined.

NASA Idaho Space Grant Consortium Crosscutting Strategy Grant: "ISGC Crosscutting Project: Nanostructured Polymer Lithography for Photovoltaic Deposition Template," $10,000, 11/01/2015 – 10/31/2016.

Idaho INBRE Developmental Research Project – "Environmental toxicology and human health implications of nanoparticles, Part 1," $797,650, 5/1/2014 – 4/30/19.

Research Grants (Cont)

NASA Idaho Space Grant Consortium STEM Grant – "ISGC STEM Project: Nanostructured Polymer Lithography For Photovoltaic Deposition Template," $2,000, submitted 11/1/13, declined.

NNU – Dean's Summer Research Fund entitled "A study of the solution-based synthesis of N-doped ZnO," $9,000, May – Aug. 2012.

Idaho NASA EPSCoR Travel Grant. Travel to NASA Glenn Research Center, Cleveland, OH. $1,600, May 2012.

NSF MRI: "Acquisition of a CCD-Equipped X-ray Diffractometer at Boise State University," E. Brown, J. Thurston, K. Cornell, J. Harris, $483,450, submitted 4/21/10, declined.

NNU – Dean's Summer Research Fund entitled "A study of the solution-based synthesis of N-doped ZnO," $3,500, 2009.

NSF CRIF:MU: "Acquisition of a CCD-Equipped X-ray Diffractometer at Boise State University," C. LeMaster, B. Bennett, E. Brown, J. Harris, $487,276, submitted 6/23/09, declined.

NSF-DMR-0840265 "Collaborative Research: RUI: A study of the solution-based synthesis of N-doped ZnO, Co- and Mn-doped ZnO, and (N,Mn)- and (N,Co)-codoped ZnO", J.D. Harris, A. Punnoose, W.B. Knowlton, S.M. Hubbard, $209,823, 2008-2012.

NNU – Dean's Summer Research Fund: "A study of the solution-based synthesis of N-doped ZnO," $14,100, 2008.

NSF-DMR "IMR: Acquisition of Fourier Transform Infrared Spectroscopic Facility for Materials Research and Student Training", D.A. Tenne, J.D. Harris, M. Mitkova, A. Punnoose, $254,760, submitted 1/10/08, declined.

NSF-DMR-0722699 "MRI: Acquisition of an XPS system for Interdisciplinary Research and Education," A. Punnoose, D. Butt, T. Fujiwara, K. Feris, J.D. Harris, $564,000, 2007-2010.

NNU – Watson Fellowship Fund: "Vertically Aligned Carbon Nanotubes for Polymer Solar Cells," $6,000, 2005-2006.

Research Corporation: "Thermogravimetric Analysis of High-Purity Nitrogen-Doped Carbon Nanotubes and Carbon Nanotube Catalysts," $38,483, submitted 5/12/05, declined.

NASA Idaho Space Grant Consortium Research Initiation Grant: "High Purity, Vertically Aligned Carbon Nanotubes for Polymer Solar Cells," $30,000, 2005-2007.

American Chemical Society - The Petroleum Research Fund: "New Catalyst Precursors for Carbon Nanotubes," $35,000, submitted 12/13/04, declined.

Research Grants (Cont)

M. J. Murdock Charitable Trust: "Acquisition of a 300 MHz NMR," D.F. Nogales, D.T. Anstine, J. R. Chase and J.D. Harris, $86,500, 2004-2007.

NASA Idaho EPSCoR Research Initiation Grant: "New Catalyst Precursors for Carbon Nanotube Growth," $25,000, submitted 9/17/04, declined.

NSF-CCLI-ANI-0411319 "Integration of NMR Spectroscopy Across the Undergraduate Curriculum," D.F. Nogales, D.T. Anstine, J. R. Chase and J.D. Harris, $88,932, 2004-2007.

NASA Idaho EPSCoR Research Initiation Grant: "Optimization of Spray Chemical Vapor Deposited Thin Films of $CuInS_2$ to Achieve Higher Efficiency Solar Cells on Polymer Substrates," $30,000, 2003-2004.

NASA Glenn Research Center: "Dye-Sensitized Solar Cells for Space Power," S.A. Duraj and J.D. Harris, $140,000, 2001-2003.

NASA Glenn Research Center: "Analysis and Characterization of Advanced Materials for Aerospace Applications," D.G. Hehemann and J.D. Harris, $238,468, 2001-2002.

NASA Glenn Research Center: "Spin-on Glassy Electrolytes for Thin-Film Lithium Microelectronic Batteries," R.P. Raffaelle, J.D. Harris, P.N. Kumta, and D.A. Scheiman, $46,182, 2000-2001.

NASA Glenn Research Center Strategic Research Fund: "Ultra Low Cost, Light Weight Dye Sensitized Nanocrystalline Solar Cells," A.F. Hepp, S.G. Bailey and J.D. Harris, $60,000, 1999-2000.

NASA Glenn Research Center: "Thin Film Technology for Space Power," A.R. Chowdhury and J.D. Harris, $99,994, 1999-2001.