



Curriculum Vitae

Leah Bergman, Associate Professor
Department of Physics, University of Idaho
Moscow, Idaho 83844-0903

EDUCATION:

Ph.D., Materials Science & Engineering, (1995), North Carolina State University, Raleigh, North Carolina

HONORS AND AWARDS:

NSF, CAREER Award, "Optical and Phonon Interactions in Ultraviolet Nano-Structures", 2003.

National Research Council Fellowship, "Phonons in Confined Wide-Bandgap Structures", US Army Research Office/NCSU, 1997-2000.

AREAS OF SPECIALIZATION:

Materials science and physics of luminescent materials and nanostructures.

Ultraviolet optical semiconductors.

Raman and photoluminescence spectroscopy.

EXPERIENCE:

Professional Appointments:

Associate Professor, Department of Physics, University of Idaho, 2006-present.

Assistant Professor, Department of Physics, University of Idaho, 2000-2006.

National Research Council Fellow. Investigated "Optical properties of superlattices, nano-structures, and alloy systems of wide bandgap III-V nitrides" in collaboration with Dr. Mitra Dutta, previously Deputy Director of the US Army Research Office, 1997-2000.

Postdoctoral Research Associate, Department of Physics and Materials Science, North Carolina State University, in collaboration with Dr. R.J. Nemanich. Investigated material and phonon properties of the III-V nitrides thin films, alloys, and crystals, 1995-1997.

Doctoral Research Assistant, Department of Physics and Materials Science, North Carolina State University. Investigated optical properties of diamond films, single crystal diamonds, and carbon materials, 1991-1995.

Classes Taught:

Physics 100: Fundamentals of Physics: Conceptual Physics.

Physics 200: Undergraduate Seminar (volunteered to be instructor).

Physics 213: Engineering Physics III: Waves, Optics, and Thermodynamics.

Physics 212: Engineering Physics II: Electricity and Magnetism.

Physics 463/563, MSE 563: Solid State Physics.

Physics 443/543: Optics.

Graduate Students:

John, L. Morrison, 2003-present. Graduated with MS December 2006. Now a Ph.D. candidate

Jesse Huso, 2004-present, Graduated with MS December 2007. Now a Ph.D. candidate

Xiang-Bai Chen, 2001-2004. Graduated Ph.D. Summer 2004

Yingwei Zhou, 2002, Graduated MS Summer 2002

Joel Feldmeier, M.S. Fall 2002-2003: graduated MS (no thesis option)

Heathe Hoeck, 2007 graduated MS

PUBLICATIONS:**Books and Book Chapters:**

“Raman Analysis of Wide Band Gap Nitrides; Film, Crystals, and Superlattices”, Leah Bergman, Mitra Dutta, and Robert J. Nemanich. In *Raman Scattering in Materials Science*, p. 273 (Editors: R. Merlin and W.H. Weber, Springer Verlag 2000).

“Raman Spectroscopy for Characterization of Hard, Wide Band Gap Semiconductors: Diamond, GaN, GaAlN, AlN, BN”, Leah Bergman and Robert J. Nemanich. *Annual Reviews of Materials Science*, Vol. 26. P.551 1996.

“Optical Properties of Synthetic Diamond Particles and Films”, Leah Bergman and Robert J. Nemanich. *Handbook of Optical Properties, Vol. II; Optics of Small Particles, Interfaces and Surfaces*. P. 331 (Editors: R.E. Hummel and P. Wibmann, CRC Press 1996).

Refereed Publications (selected list):

“Optical transitions and multiphonon Raman scattering of Cu doped ZnO and MgZnO ceramics”, Jesse Huso, John L. Morrison, James Mitchell, Erin Casey, Heather Hoeck, Chris Walker, Leah Bergman, W. M. Hlaing Oo, and M. D. McCluskey, *Appl. Phys. Lett.* **94**, 061919 (2009).

“X-ray diffraction of $\text{Mg}_x\text{Zn}_{1-x}\text{O}$ and ZnO nanocrystals under high pressure”, K. K. Zhuravlev, W. M. Hlaing Oo, M. D. McCluskey, J. Huso, J. L. Morrison, and L. Bergman, *J. Appl. Phys.* **106** 013511 (2009).

“Suppression of conductivity in Mn-doped ZnO thin films”, W.M. Hlaing Oo, L.V. Saraf, M.H. Engehard, V. Vhuttanandan, L. Bergman, J. Huso, and M.D. McCluskey, *J. Appl. Phys.* **105**, 013715 (2009).

“Optical properties of ZnO and MgZnO nanocrystals below and at the phase separation range”, John L. Morrison, Jesse Huso, , Heather Hoeck, Erin Casey, James Mitchell, Grant Norton, and Leah Bergman, *J. Appl. Phys.* **104**, 123519 (2008).

“Pressure Response of the Ultraviolet Photoluminescence of ZnO and MgZnO Nanocrystallites” Jesse Huso, John L. Morrison, Heather Hoeck, Xiang-Bai Chen, S.J. Jokela, M.D. McCluskey, Tsvetanka Zheleva, Leah Bergman, *Appl. Phys. Lett.* **89**, 171909 (2006). **Paper selected** by the American Physical Society and the American Institute of Physics to appear in their Virtual Journal of Nanoscale Science & Technology, issue of 11-6-2006. <http://www.vjnano.org>

“Dynamics of GaN Bandedge Photoluminescence at Near-Room Temperature Regime” Xiang-Bai Chen, Jesse Huso, John L. Morrison, Leah Bergman, *J. Appl. Phys.* **99**, 46105 (2006).

“Ultraviolet Photoluminescence and Raman Properties of MgZnO Nanopowders” Leah Bergman, John L. Morrison, Xiang-Bai Chen, Jesse Huso, Heather Hoeck, *Appl. Phys. Lett.* **88**, 023103 (2006). **Paper selected** by the *American Physical Society* and the *American Institute of Physics* to appear in their *Virtual Journal of Nanoscale science & Technology*, issue of 1-23-06. <http://www.vjnano.org>

”Raman Scattering of Polar-Modes of ZnO Crystallites”, Leah Bergman, Xiang-Bai Chen, Jesse Huso, John L. Morrison, *J. of Appl.Phys.* **98**, 093507 (2005).

“Temperature response and anharmonicity of the optical phonons in GaN nanowires” Xiang-Bai Chen, Jesse Huso, John L. Morrison, Andrew P. Purdy, Leah Bergman, *J. of Appl.Phys.* **98**, 026106 (2005). Paper selected by the *American Physical Society* and the *American Institute of Physics* to appear in their *Virtual Journal of Nanoscale science & Technology*, vol.**12**, issue 5, 2005. <http://www.vjnano.org>

“Ultraviolet Raman scattering of GaN nanocrystallites: Intrinsic versus collective phenomena”, Xiang-Bai Chen, John L. Morrison, Jesse Huso, Andrew P. Purdy, Leah Bergman, *J. of Appl.Phys.* **97**, 024302 (2005).

“Room temperature ferromagnetic and ultraviolet optical properties of Co-doped ZnO nanocluster films”, J. Antony, S. Pendyala, A. Sharma, X-B. Chen, J. Morrison, L. Bergman, Y. Qiang, *J. of Appl. Phys.* **97**, 10D307 (2005).

“ZnO Nanoclusters: Synthesis and Photoluminescence”, J. Antony, X-B. Chen, J.Morrison, L. Bergman, Y. Qiang, D.E. McCready, M. Engelhard, *Appl. Phys. Lett.* **87**, 241917 (2005).

- “Photoluminescence dynamics in ensembles of wide-band-gap nanocrystallites and powders”, Leah Bergman, Xiang-Bai Chen, John L. Morrison, Jesse Huso, Andrew P. Purdy *J. of Appl. Phys.* **96**, 675 (2004).
- “Impact of ultraviolet laser heating on the photoluminescence of ensembles of GaN microcrystallites”, L. Bergman, X-B. Chen, J. Feldmeier, and A.P. Purdy *Appl. Phys. Lett.* **83**, 764 (2003).
- “Probing the $Al_x Ga_{1-x} N$ Spatial Alloy Fluctuation via UV-Photoluminescence and Raman at Submicron Scale”, L. Bergman, X. Chen, D. McIlroy, R.F. Davis. *Appl. Phys. Lett.* **81**, 4186 (2002).
- “Phonons in III-V nitrides: Confined phonons and interface phonons”, M. Dutta, D. Alexson, L. Bergman, R.J. Nemanich, R. Dupuis, K.W. Kim, S. Komirenko, and M. Stroschio, *Physica E*. **11**, 277 (2001).
- “Ultraviolet Raman study of A1(LO) and E2 phonons in InGaN alloys”, Dimitri Alexson, Leah Bergman, Mitra Dutta, Nadia El Masry, Salah Bedair, Michael A. Stroschio, and Fran Adar, *J. of Appl. Phys.* **89**, 798. (2001).
- “Photoluminescence and Recombination Mechanisms in GaN/ $Al_{15}Ga_{85}N$ Superlattice”, Leah Bergman, Mitra Dutta, M.A. Stroschio, S.M. Komirenko, Robert J. Nemanich, C.J. Eiting, D.J.H. Lambert, H.K. Kwon, and Russell D. Dupuis, *Appl. Phys. Lett.* **76**, 1969 (2000).
- “Confined Phonons and Phonon-mode properties of III-V Nitrides with wurtzite crystal structure”, D. Alexson, L. Bergman, M. Dutta, K.W. Kim, S. Komirenko, R.J. Nemanich, B.C. Lee, M.A. Stroschio, and S. Yu, *Physica B*, **263**, 510 (1999).
- “Raman Analysis of Phonon-Lifetimes in AlN and GaN of Wurtzite structure”, L. Bergman, Patrick L. Murphy, M. Dutta, M.A. Stroschio, R.F. Davis, and R.J. Nemanich, *Phys. Rev. B*. **59**, 12977 (1999).
- “Raman Analysis of the E1 and A1 Quasi-LO and -TO Modes in Wurtzite AlN”, L. Bergman, M. Dutta, C. Balkas, R.F. Davis, D. Alexson, and R.J. Nemanich, *J. of Appl. Physics* **85**, 3535 (1999).
- “Long Wavelength Optical Phonons in Ternary Nitride-Based Crystals”, S. Yu, K.W. Kim, L. Bergman, M. Dutta, M.A. Stroschio, and J.M. Zavada, *Phys. Rev. B*. **58**, 15283 (1998).
- “Raman Analysis of the Configurational Disorder in $Al_x Ga_{1-x} N$ films”, L. Bergman, M.D. Bremser, W. G. Perry, R. F. Davis, M. Dutta, and R. J. Nemanich, *Applied Physics Letters* **71**, 2157 (1997).
- “Sublimation Growth and Characterization of Bulk Aluminum Nitride Single Crystals”, C.M. Balkas, Z. Sitar, T. Zheleva, L. Bergman, R.J. Nemanich, and R.F. Davis, *J. Crys. Growth*, **179**, 363 (1997).
- “Photoluminescence from Mechanically Milled Si and SiO₂ Powders”, T.D. Shen, I. Shmagin, C.C. Koch, R.M. Kolbas, L. Bergman, R.J. Nemanich, M.T. McClure, Z. Sitar, and M.X. Quan, *Phys. Rev. B*. **55**, 7615-7623 (1997).
- “Raman and Photoluminescence Analysis of Stress State and Impurity distribution in Diamond Thin Films”, L. Bergman and R.J. Nemanich, *J. of Appl. Physics*, **78**, 6709-6719 (1995).
- “The Origin of the Broadband Luminescence and the Effect of the Nitrogen Doping on the Optical Properties of Diamond Films”, *J. of Appl. Physics*, L. Bergman, M.T. McClure, J.T. Glass and R.J. Nemanich **76**, 3020-3027 (1994).
- “Micro-Photoluminescence and Raman Scattering Study of Defect Formation in Diamond Films”, L. Bergman, B.R. Stoner, K.F. Turner, J.T. Glass and R.J. Nemanich, *J. of Appl. Physics*, **73**, 3951-3957 (1993).
- “Properties of Interfaces of Diamond”, Trieste Semiconductor Symposium on Wide-Band-Gap Semiconductors, *Physica B*, R.J. Nemanich, L. Bergman, K.F. Turner, J. van der Weide and T.P. Humphreys, **185**, 528-538 (1993).
- “Electrical Conductivity and Photoluminescence of Diamond Films Grown by Downstream Microwave Plasma CVD”, B.R. Stoner, J.T. Glass, L. Bergman, R.J. Nemanich, L.D. Zolton and J.W. Vandersande, *Journal of Electronic Materials*, **21**, 629-634 (1992).
- “Effects of Boron Doping on the Surface Morphology and Structural Imperfections of Diamond Films”, X. H. Wang, G.-H.M. Ma, W. Zhu, J.T. Glass, L. Bergman, K.F. Turner, and R.J. Nemanich, *Journal of Diamond and Related Materials*, 828 (1992).

“Observation of surface modification and nucleation during deposition of diamond on silicon by scanning tunneling microscopy”, K.F. Turner, B.R. Stoner, L. Bergman, J.T. Glass, and R.J. Nemanich, *Journal of Applied Physics*, **69**, 6400-6405 (1991).

“Polarization Currents in Varistors”, F. Modin, R. Major S. Choi, L. Bergman, M. Silver, *Journal of Applied Physics*, **68**, 339 (1990).

Special Publications:

NSF Electronic-Materials Research Highlights: L. Bergman, “Optical Bandgap Engineering of UV-Luminescent Nanomaterials”. <http://www.nsf.gov/mps/dmr/highlights/05highlights/em.jsp>

Contributed Papers (selected list):

Gordon Conference on *Defects in Semiconductors*, New London NH 2006. “MgZnO Nanoalloys: Optical, and Phonon Properties at Ambient and Extreme Conditions” Jesse Huso, John L. Morrison, Heather Hoeck, James Mitchell, Matt D. McCluskey, Tsvetanka Zheleva, Leah Bergman. Poster presentation.

Talk at MRS Fall Meeting, Boston, 2006. Symposium PP Materials Research at High Pressure.

“Pressure Response of the Ultraviolet Photoluminescence of ZnO and MgZnO Nanocrystallites”,

Jesse Huso, John L. Morrison, Heather Hoeck, Xiang-bai Chen, S. J. Jokela, and M. D. McCluskey, Leah Bergman.

Talk and a poster at MRS Fall Meeting, Boston, 2006. Symposium K *ZnO and Related Materials*. “Photoluminescence and Phonon Properties of ZnO and MgZnO Nanocrystallites”, John L. Morrison, Jesse Huso, Heather Hoeck, Erin Casy, Xiang-bai Chen, Tsvetanka Zheleva, Leah Bergman.

Talk at APS Northwest Section, May 2006. “Ultraviolet-Photoluminescence and Raman Properties of wide bandgap Nanopowders”, John L. Morrison, Xiang-Bai Chen, Jesse Huso, Heather Hoeck, James Mitchell, Leah Bergman.

Talk at APS Northwest Section, May 2006. “Pressure Response of the UV-Photoluminescence of ZnO and MgZnO Nanocrystallites”, Jesse Huso, John L. Morrison, Heather Hoeck, Slade Jokela, Matthew McCluskey, Tsvetanka Zheleva, Leah Bergman.

“Optically Tunable MgZnO Nanocrystallites and their Structural Properties”, John L. Morrison, Xiang-Bai Chen, Jesse Huso, Heather Hoeck, James Mitchell, Dario A. Machleidt, Leah Bergman, Tsvetanka Zheleva. Poster presentation and paper accepted to the proceedings of MRS Fall Meeting Session EE/FF 2005.

“Wide-Bandgap Engineered Nanoalloys”. L. Bergman, talk at *the International Semiconductor Device Research Symposium (ISDRS)*, Maryland, December 2005.

“Resonant-Raman scattering of ZnO crystallites: the quasi nature of the LO mode”, Xiang-Bai Chen, John L. Morrison, Jesse Huso, Jonathan G. Metzger, Shlomo Efrima, Leah Bergman, *Mater. Res. Soc. Symp. Proc.* (Fall 2005). Vol. 832, E11.5.1

“Optical and Structural Properties of MgZnO Nanocrystallites”, L. Bergman, talk at MRS Fall Meeting Boston, 2005.

“Properties of the LO-Phonons in GaN Nanocrystallites” Chen, Bergman, talk at APS March meeting 2005.

“UV Raman Scattering Analysis of Indented and Machined 6H-SiC and β -Si₃N₄ Surfaces”, Jennifer J.H. Walter, Mengning Liang, Xiang-Bai Chen, Jae-il Jang, Leah Bergman, John A. Patten, George M. Pharr, Robert J. Nemanich, *Mater. Res. Soc. Symp. Proc.* (Fall 2004) Vol. 84, T4.10

“Synthesis and Characterization of ZnO Nanoparticles”, Isi Umolu Abbulimen, Xiang-Bai Chen, John L. Morrison, Vijaya Kumar Rangari, Leah Bergman, Kalyan Kumar Das, *Mater. Res. Soc. Symp. Proc.* (Fall 2004) Vol. 829, B2.27

“Optical Interactions and Photoluminescence Properties of Wide-Bandgap Nanocrystallites”, Leah Bergman, Xiang-Bai Chen, Jesse Huso, Althea Walker, John L. Morrison, Heather Hoeck, Margaret K. Penner, Andrew P. Purdy. *Mater. Res. Soc. Symp. Proc.* (Spring 2004) Vol. 789, N11.17.1

“Ultraviolet Raman scattering in GaN nanocrystallites”, Xiang-Bai Chen, John Morrison, Jennifer Elle, Jesse Huso, Dmitriy Myedvyedyev, Leah Bergman, Andrew Purdy, *APS Northwest Section*, B4.002, 2004.

“Impact of Ultraviolet-Laser Heating on the Photoluminescence and Raman Scattering of Ensembles of GaN Nanocrystallites”, John Morrison, Xiang-Bai Chen, Jennifer Elle, Jesse Huso, Dmitriy Myedvyedyev, Leah Bergman, Andrew Purdy, *APS Northwest Section*, B4.003, 2004.

“Excitonic Recombination and Raman Scattering in GaN Nanocrystallites of Different Surface Morphologies”, Xiang-Bai Chen, Jesse Huso, John Morrison, Jennifer Elle, Dmitriy Myedvyedyev, Leah Bergman, Andrew Purdy, *APS Northwest Section*, B4.004, 2004.

“Origins of light emissions and efficiency saturations of the photoluminescence of GaN nanocrystallites”, X-B Chen, J.L. Morrison, M.K. Penner, J. Elle, L. Bergman, and, A.P. Purdy. *Mat. Res. Soc. Symp. Proc.* Vol. 798, Y5.73.1, 2003.

“Red shifted photoluminescence of ensembles of GaN nanocrystallites”, L. Bergman, X-B. Chen, J. Feldmeier, and A.P. Purdy, *Mat. Res. Soc. Symp. Proc.* Vol. 776, Q1.1.1 2003,

“UV Raman scattering in 6H-SiC indents”, J.J. Huening, R.J. Nemanich, J-I Jang, G.M. Pharr, X-B Chen, and L. Bergman. *Proc. Of the American Society for Precision Engineering*, Vol. 30 415, 2003.

“Photoluminescence of nanocrystals”, L. Bergman, *Materials Research Society 8th Wide bandgap III-Nitrides Workshop*, Virginia 2003.

“Photoluminescence Properties of Nano-Scale GaN Particles and Clusters”, L. Bergman, X-B. Chen, J. Feldmeier, M. Fowler, A. Purdy, *American Physical Society, March Meeting*, 2003.

“Study of Spatial Fluctuation Dependence of Photoluminescence in AlGa_N Wide-Bandgap Semiconductors”, J. Feldmeier, X. Chen, A. Kessler, J. Morrison, B. Pagdon, and L. Bergman, *American Physical Society, March Meeting*, 2003.

“Origins of light emissions in GaN and AlGa_N”, L. Bergman, X-B. Chen, *American Physical Society, March Meeting*, 2003.

“Probing the Alloy Distribution in AlGa_N Wide-Bandgap Semiconductors Via UV-Photoluminescence”, L. Bergman, X. Chen, T. Householder, D. McIlroy, W-J Yeh, S. Terrell, and R. Davis. *Materials Research Society Spring Meeting Proceedings: in Engineered Defect in Semiconductors*, Vol. 719, 2002.

“Growth and Characterization of SiC Nanowires and Nanosprings”, D. Zhang, A. Alkhateeb, S. Wright, Y. Zhou, L. Bergman, D. McIlroy, and G. Norton., *American Physical Society, Spring Meeting* 2002.

“UV Raman and Photoluminescence Studies of III-V Nitrides Based Semiconductors”, Leah Bergman, *The 28th Annual Conference of the Federation of Analytical Chemistry & Spectroscopy Societies; Book of Abstracts* p. 145, 2001.

“Raman Scattering of Confined Phonons in GaN-AlN Superlattices”, Mitra Dutta, Leah Bergman, Michael A. Stroscio, and Russell D. Dupuis. *NATO ARW conference* 2001.

“Angular Raman Tensors and lifetimes of Wurtzite Structured Materials”, L. Bergman, M. Dutta, M.A. Stroscio, R.F. Davis, and R.J. Nemanich. in *Materials Research Society Proceedings: GaN and Related Alloys* 1998.

“Raman Analysis of Al_xGa_{1-x}N Films”, L. Bergman, M. Dutta, M.D. Bremser, O.H. Nam, W.G. Perry, D. Alexson, R.F. Davis, C.M. Balkas, and R.J. Nemanich. *Materials Research Society Proceedings: Nitride Semiconductors* Vol 482, P. 543 1997.

Invited Talks:

Invited talk at the TMS; The Mineral, Metals & Materials Society on “Luminescent MgZnO Nanoalloys”, Orlando Florida February, 2007.

Invited talk at Washington State University, Department of Chemistry. “Luminescent Nanoalloys” 2006,

Invited talk at the US Army Research Lab “Luminescent Wide-Bandgap Materials: Alloys, Films, and Nanopowders” (April 2005).

Invited presentation at the conference: *Particles-2004* Orlando. "Photoluminescence properties of wide-bandgap nanocrystallites" (2004).

Invited presentation at Research Colloquium ECE, University of Idaho "Optical properties of wide-bandgap nanoparticles; Collective phenomena" (2004).

Invited presentation at the Naval Research Laboratory "Optical Properties of GaN Nanoparticles" (January 2003).

Invited presentation at the US Army Research Lab "Optical Interactions of GaN Nanostructures" (January 2003).

Invited presentation at the Undergraduate Seminar, Department of Chemistry Washington State University (2003).

Invited Presentation at the Physics Seminar, Washington State University, "Photoluminescence of GaN-AlN Films and Nano-Particles" (October 2002).

Invited Presentation at the *Ninth Annual International Conference on Composites Engineering* "Studies of Wide-Bandgap Semiconductor Alloy via UV-Photoluminescence and Raman Spectroscopy" (ICCE/9, San Diego, California July 2002).

Invited Presentation at the *Federation of Analytical Chemistry & Spectroscopy Societies*, "UV Raman and Photoluminescence Studies of III-V Nitrides Based Semiconductors" (FACSS Detroit, Michigan October 2001).

Invited Presentation at Chemistry Department, University of Idaho "Optical Interactions in Semiconductors" (Fall 2001).

Invited Presentation at the Physics Seminar at Washington State University, "Raman and Photoluminescence Studies of III-V Nitrides Semiconductors", (Fall 2001).

Invited Presentation at the Student Chapter; Materials Engineering Department, Washington State University, "Optical studies of Semiconductors", (Spring 2001).

Invited Presentation at the American Physical Society on the topic of "Optical and Vibrational Properties of Nitride Based Semiconductors" (Spring Meeting, Minneapolis, 2000).

Conference Chair/Organizer:

Organizer for NWAPS-06 Condensed Matter session

Chair in the session in Symposium FF - GaN, AlN, InN, and Related Materials in *Fall MRS Meeting* 2005.

Chair in the session of Chemistry III, at the *Ninth Annual International Conference on Composites Engineering* ICCE/9, San Diego, California July 2002.

Chair in the session of "Quantum Wells: Experiments and Optics", *American Physical Society March Meeting*, Seattle 2001.

GRANTS AND CONTRACTS:

"Magnetic and Optical Properties of Ferromagnetic ZnO Nanoclusters" L. Bergman PI at the UI site, in collaboration with Dr. Matt McCluskey Department of Physics WSU (PI at WSU site). DOE Office of Science, 2007-2010.

"Optical and Structural Properties of Wide Bandgap Semiconductors Under Extreme Conditions", American Chemical Society-PRF (PI: L. Bergman, Co-PI: Matt McCluskey WSU), 2004-2007.

Summer Research Fellowship for a visiting professor to participate in the ongoing PRF research, (PI: L. Bergman), American Chemical Society-PRF, Summer 2005.

"Synthesis and Characterization of Wide Bandgap Semiconductors for Optoelectronics Applications", DOE-EPSCoR, (Co-PI with Peter Griffiths, and Rene Rodriguez, PI's), 2004-2010.

“Optical and Phonon Interactions in Ultraviolet Nano-Structures”, NSF-DMR, CAREER, (PI: L. Bergman), 2003-2008.

“Nano-Scale Materials and sensors”, NSF-EPSCOR, (Co-PI with Group leaders J. Shreeve and D. McIlroy), 2002-2005.

“Optical Interactions and Structural Studies of UV Semiconductors: Powders, Wires, and Particles in the Nano-Scale Regime”, NASA Idaho Space Grant Consortium, (PI: L. Bergman), 2002-2003.

“Ultraviolet Optical Materials and Quantum Dots”, Seed Grant, (PI: L. Bergman), 2001-2002.

“An Idaho Physics Department Based Research Experience for Undergraduates Sites” (Co-PI). Starting Summer 2002-Present.

“Two-dimensional Photonic Crystals for near IR and Visible Optoelectronics Applications”, AFOSR, (Co-PI with David McIlroy PI), 2001-2004.

“Study of Wide Band-Gap Semiconductors for Ultraviolet Applications”, NASA Idaho Space Grant Consortium, (PI: L. Bergman), 2001-2002.

Other External Funding:

INTEL Corporation, for UV-Raman scattering research on INTEL’s electronic circuits and materials, (PI: L. Bergman). 2005, 2008.

Collaborations (past and ongoing):

Grant Norton, Department of Mechanical and Materials Engineering, Washington State University

Matt McCluskey, Department of Physics Washington State University

Robert J. Nemanich, Dept. of Physics, North Carolina State University,

Currently at Arizona State University (Ph.D. advisor)

Tsvetanka Zheleva, US Army Research Lab, Adelphi MD

Andrew Purdy, Division of Chemistry, Naval Research Laboratory (NRL)

Kumar Das, Department of Electrical Engineering, Tuskegee University, Alabama

Jennifer Walter, INTEL Corporation, Oregon

Robert F. Davis, Dept. of Materials Science and Engineering, North Carolina State University. Currently at

Carnegie Mellon University.

Mitra Dutta, Army Research Office NC. Currently at the University of Illinois Chicago.