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EDUCATION:

Ph.D. in Physics, University of Illinois at Urbana-Champaign, 1988.

B.A. in Mathematics and Physics with Highest Distinction,
University of Virginia, Charlottesville, VA, 1982.

HONORS, AWARDS AND FELLOWSHIPS:

Fellow of the Academy for Teaching and Learning, University of Cincinnati, 2013.
Innovative Uses of Technology in Teaching Award, University of Cincinnati, 2011.
Fellow of the Graduate School of the University of Cincinnati, 2010.
Edith C. Alexander Award for Teaching Excellence, College of Arts and Sciences, University of Cincinnati, 1998.
Nominated for the Dolly Cohen Award for Teaching Excellence, University of Cincinnati, 1996, 1997, and 1998.
Allan Berman Research Publication Award, Naval Research Laboratory, 11/96.
University of Cincinnati Faculty Achievement Award, 11/96
IBM Pre-Doctoral Fellowship, 9/87-5/88.
Shell Foundation Pre-Doctoral Fellowship, 9/86-9/87.
National Science Foundation Pre-Doctoral Fellowship, 5/83-5/86.
J. W. Elkins Award in Physics, University of Virginia, 5/82.
Echols Scholar, University of Virginia, 9/78-5/82.
National Merit Scholar, 1978.

HONOR SOCIETIES AND PROFESSIONAL ORGANIZATIONS:

Sigma Xi, 4/89.
American Physical Society, 9/83.
Phi Beta Kappa, University of Virginia, 4/81.
Raven Society, University of Virginia, 4/81.

PROFESSIONAL EXPERIENCE:

9/01 -	University of Cincinnati, Full Professor
9/96 - 9/01	University of Cincinnati, Associate Professor
9/99 – 9/00	Technical University of Denmark, Visiting Professor
9/90 - 9/96	University of Cincinnati, Assistant Professor
5/88 - 9/90	IBM Thomas J. Watson Research Center, Visiting Scientist

5/83 - 5/88 University of Illinois at Urbana-Champaign, Graduate Assistant
9/82 - 5/83 Princeton University, Graduate Assistant

RESEARCH INTERESTS:

My main areas of interest lie in the physics of electronic states in semiconductor nanostructures: cofinement potentials, wavefunctions, many body effects, and interactions with phonons, photons, or impurities. A general theme of my research is to combine:

(a) ultrahigh **spectral resolution**: to determine the energetics of these states with micro-eV precision.
(b) sub-micron **spatial resolution**: to isolate single quantum confined states, or measure the transport properties of neutral particles.
(c) picosecond **temporal resolution**: to measure the *dynamics* of interactions between these various states.

to achieve a more complete picture of these electronic states and their interactions. In particular, my research publications can be divided into several areas: (1) semiconductor nanowire heterostructures, (2) quantum dots and their excitons, (3) exciton spins and magnetic impurities, (4) exciton transport and interactions with spins or phonons, (5) many-body effects in semiconductors.

TEACHING INTERESTS:

During 2010-present I have been developing a flipped classroom approach to teaching the algebra-based Physics course. Students outside of class combine reading assignments with short sets of conceptual questions and watch online videos developed by me to introduce the material. During class students work in randomized groups specifically on homework problems as guided by using the personal response system LearningCatalytics. This method has resulted in significant improvement in student learning of students at all levels of background, but particularly students who have the weakest background in mathematics. This effort is ongoing.

During 2007-2010, I was involved in the development of three online courses "How Things Work" using the book by Louis Bloomfield of the University of Virginia. This course now enrolls 200 students each quarter (130 in-class and 70 online) which cover Physics Concepts in Mechanics, Fluids and Aerodynamics (Fall), Gravity, Orbital Mechanics, Thermodynamics and Global Warming (Winter), and Mechanical Waves, Optics, Quantum Mechanics, and Nuclear Power (Spring). This course is designed as a survey course for non-technical students. All of the assignments and tests are taken online by both sections, and there is significant activity (>1500 posts/quarter) in various discussion boards which discuss these topics. The in-class sections also utilize the Personal Response System (clickers) where students are actively involved in responding to rhetorical questions within the class. The guiding premise in this class is to use deconstruction of everyday objects and situations in order to teach physics concepts with essentially no mathematics. This course was successfully handed over to Andrei Kogan who still has significant numbers of online and inclass students who take this survey course.

During (2005-2009) I have participated in an NSF Supported ($175,000) Curriculum development project on Nanoscale Science and Technology. Two courses were developed: PHYS 278/CHEM 278/ENFD 278 which is a lecture course involving participatants in Physics, Chemistry, Electrical, Mechanical, and Chemical Engineering, Materials Science and

Philosophy, and which covers the major scientfic challenges in current nanoscience as well as societal implications. PHYS 279/CHEM 279/ENFD 279 is an intensive Laboratory Course which involves synthesis and characterization techniques for Nanoscale Materials such as carbon nanotubes, gold plasmonic nanoparticles, and quantum dots.

Previously (2001-2003) I was involved in the development of the new course Intermediate Physics (PHYS 351, PHYS 352 and PHYS 353) which introduces 2nd year physics majors to concepts of waves through classical mechanics to quantum mechanics, also including diversions into Vector Calculus and Fourier Series and Transforms, as well as Special Relativity. This course involved 4 lectures/recitations and a 3 hour laboratory each week. The laboratories involved novel experiments in waves and oscillators, and quantum mechanics, with modelling, analysis, and lab reports made using *Mathematica.*

During (1995-1999) I developed a series of novel laboratories in collaboration with Richard Gass for the Honors General Physics taken by honors students and physics majors. The laboratories were designed to teach students experimental techniques and analysis using *Mathematica* and are still in active use today.

PUBLICATIONS:

1. *"Illuminating the Second Conduction Band and Spin-Orbit Energy in Single Wurtzite InP Nanowires,"* S. Perera, T. Shi, M.A. Fickenscher, H.E. Jackson, **L.M. Smith**, J. Yarrison-Rice, S. Paiman, Q. Gao, H.H. Tan, and C. Jagadish, Nano Letters 13, 5367 (2013).

2. *"Optical, Structural, and Numerical Investigations of GaAs/AlGaAs Core–Multishell Nanowire Quantum Well Tubes,"* Melodie Fickenscher, Teng Shi, Howard E. Jackson, **Leigh M. Smith**, Jan M. Yarrison-Rice, Changlin Zheng, Peter Miller, Joanne Etheridge, Bryan M. Wong, Qiang Gao, Shriniwas Deshpande, Hark Hoe Tan, and Chennupati Jagadish, *Nano Letters* **13**, 1016 (2013).

3. *Transient Rayleigh Scattering: A new probe of picosecond carrier dynamics in a single semiconductor nanowire,* Mohammad Montazeri, Howard E. Jackson, **Leigh M. Smith**, Jan M. Yarrison-Rice, Jung-Hyun Kang, Qiang Gao, Hark Hoe Tan, Chennupati Jagadish, *Nano Letters* **12**, 5389-5395 (2012).

4. *"Measuring the energy landscape in single semiconductor nanowires,"* **L.M. Smith**, H.E. Jackson, J.M. Yarrison-Rice and Chennupati Jagadish, Acta Physica Polonica A **122**, 316-320 (2012).

5. *"Growth and properties of III-V compound semiconductor heterostructure nanowires,"* Q. Gao, H.H. Tan, H.E. Jackson, **L.M. Smith**, J.M. Yarrison-Rice, J. Zou and C. Jagadish, *Semiconductor Science and Technology* **27**, 059502 (2012).

6. *Defect-Free GaAs/AlGaAs Core-Shell Nanowires on Si Substrates,* Jung-Hyun Kang, Quiang Gao, Hannah J Joyce, Hoe H. Tan, C. Jagadish, Y. Kim, YA Guo, HY Xu, J. Zou, M.A.

Fickenscher, **L.M. Smith**, H.E. Jackson, and J.M. Yarrison-Rice, *Crystal Growth and Design*, **11**, 3109-3114 (2011). link

7. *Direct imaging of the spatial diffusion of excitons in single semiconductor nanowires,* M.A. Fickenscher, H.E. Jackson, **L.M. Smith**, J.M. Yarrison-Rice, J.H. Kang, S. Paiman, Q. Gao, H.H. Tan and C. Jagadish. *Applied Physics Letters*, **99**, 263110 (2011). link

8. *Photomodulated Rayleigh Scattering of Single Semiconductor Nanowires: Probing Electronic Band Structure,"* M. Montazeri, A. Wade, M.A. Fickenscher, H.E. Jackson, **L.M. Smith**, J.M. Yarrison-Rice, Q. Gao, H.H. Tan, and C. Jagadish, *Nano Letters*, **11**, 4329-4336 (2011). link

9. *Defect-Free GaAs/AlGaAs Core-Shell Nanowires on Si Substrates,* Jung-Hyun Kang, Quiang Gao, Hannah J Joyce, Hoe H. Tan, C. Jagadish, Y. Kim, YA Guo, HY Xu, J. Zou, M.A. Fickenscher, **L.M. Smith**, H.E. Jackson, and J.M. Yarrison-Rice, *Crystal Growth and Design*, **11**, 3109-3114 (2011). link

10. *III-V semiconductor nanowires for optoelectronic device applications,* Hannah J. Joyce, Qiang Gao, H. Hoe Tan, C. Jagadish, Yong Kim, Jin Zou, **Leigh M. Smith**, Howard E. Jackson, Jan M. Yarrison-Rice, Patrick Parkinson and Michael B Johnston, *Progress in Quantum Electronics,* **35**, 23-75 (2011). link

11. *The morphology and evolution of bipyramidal gold nanoparticles,* N.K. Geitner, A. Doepke, M.A. Fickenscher, J.M. Yarrison-Rice, W.R. Heineman, H.E. Jackson and **L.M. Smith**, *Nanotechnology* **22**, 275607 (2011). link

12. *Photocurrent spectroscopy of single CdS nanosheets: Valence band structure and two photon absorption,* P. Kumar, A. Wade, **L.M. Smith**, H.E. Jackson, J.M. Yarrison-Rice, Y.J. Choi, and J.G. Park, *Applied Physics Letters* **98**, 143102 (2011).

13. *Growth and properties of III-V compound semiconductor heterostructure nanowires,* Q. Gao, H.H. Tan, H.E. Jackson, **L.M. Smith**, J.M. Yarrison-Rice, J. Zou and C. Jagadish, *Semiconductor Science and Technology* **26**, 014035 (2011).

14. *Probing valence band structure in wurtzite InP nanowires using excitation spectroscopy,* S. Perera, K. Pemasiri, M.A. Fickenscher, H.E. Jackson, **L.M. Smith**, J. Yarrison-Rice, S. Paiman, Q. Gao, H.H. Tan, and C. Jagadish, Applied Physics Letters 97, 023106 (2010).

15. *Selective excitation of exciton transitions in PTCDA crystals and films,* V.R. Gangilenka, L.V. Titova, **L.M. Smith**, H.P. Wagner, L.A.A. DeSilva, L. Gisslen and R. Scholz, *Physical Review B* **81**, 155208 (2010).

16. *Direct Measure of Strain and Electronic Structure in GaAs/GaP Core-Shell Nanowires,* Mohammad Montazeri, Melodie Fickenscher, **Leigh M. Smith**, Howard E. Jackson, Jan Yarrison-Rice, Jung Hyun Kang, Qiang Gao, H. Hoe Tan, Chennupati Jagadish, Yanan Guo, Jin Zou, Mats-Erik Pistol and Craig Pryor, *Nano Letters*, **10**, 880-886 (2010).

17. *Insights into single semiconductor nanowire heterostructures using time-resolved photoluminescence,* **Leigh M. Smith**, Howard E. Jackson, Jan M. Yarrison-Rice and Chennupati Jagadish, *Semiconductor Science and Technology* **25**, 024010 (2010).

18. *Novel growth and properties of GaAs nanowires on Si substrates,* J.H. Kang, Q. Gao, H.J. Joyce, C. Jagadish, Y. Kim, D.Y. Choi, Y. Guo, H. Xu, J. Zou, M.A. Fickenscher, **L.M. Smith**, H.E. Jackson, and J.M. Yarrison-Rice *Nanotechnology* **21**, 035604 (2010).

19. *"Nanowires for Optoelectronic Applications,"* Q. Gao, H.J. Joyce, S. Paiman, J.H. Kang, H.H. Tan, Y. Kim, **L.M. Smith**, H.E. Jackson, J.M. yarrison-Rice, X. Zhang, J. Zou, and C. Jagadish, *Physica Status Solidi C 6, 2678-2682 (2009).*

20. *"Novel growth and properties of GaAs nanowires on Si substrates,"* J.H. Kang, Q. Gao, H.H. Tan, C. Jagadish, Y. Kim, D.Y. Choi, Y. Guo, H. Xu, J. Zou, M.A. Fickenscher, **L.M. Smith**, H.E. Jackson, and J.M. Yarrison-Rice, *Nanotechnology* **21,** 035604 (2009).

21. *"Raman stress mapping of CdS nanosheets,"* Mohammad Montazeri, **Leigh M. Smith**, Howard E. Jackson, Jan M. Yarrison-Rice, Young-Jin Choi, and Jae-Gwan Park, *Applied Physics Letters* **95**, 083105 (2009).

22. *"Room Temperature Photocurrent Spectroscopy of Single Zincblende and Wurtzite InP Nanowires,"* A. Maharjan, K. Pemasiri, A. Wade, **L.M. Smith**, H.E. Jackson, J.M. Yarrison-Rice, A. Kogan, S. Paiman, Q. Cao, H.H. Tan, and C. Jagadish, *Applied Physics Letters* **94**, 193115 (2009).

23. *"Effect V/III ratio and catalyst particle size on the crystal structure and optical properties of InP nanowires,"* S Paiman, Q Gao, H H Tan, C Jagadish, K Pemasiri, M Montazeri, H E Jackson, **L M Smith**, J M Yarrison-Rice, X Zhang and J Zou, *Nanotechnolog*y, **20**, 225606 (2009).

24. *"Carrier dynamics and quantum confinement in Type-II ZB-WZ InP nanowire homostructures,"* Kurananda Pemasiri, Mohammad Montazeri, Richard Gass, **Leigh M. Smith**, Howard E. Jackson, Jan Yarrison-Rice, Suriati Paiman, Qiang Gao, H. Hoe Tan, Chennupati Jagadish, Xin Zhang, and Jin Zou, Nano Letters **9**, 648-654 (2009).

25. *"Unexpected Benefits of Rapid Growth Rate for III–V Nanowires,"* Hannah J. Joyce, Qiang Gao, H. Hoe Tan, Chennupati Jagadish, Yong Kim, Melodie A. Fickenscher,

Saranga Perera, Thang Ba Hoang, **Leigh M. Smith**, Howard E. Jackson, Jan M. Yarrison-Rice, Xin Zhang, and Jin Zou, Nano Letters **9**, 695-701 (2009).

26. *"Optical Properties of Single CdS Nanosheets,"* H. Rho, K.Y. Lee, T.B. Hoang, T.V. Titova, A. Mishra, **L.M. Smith**, H.E. Jackson, J.M. Yarrison-Rice, Y.J. Choi, K.J. Choi, and J.G. Park, Journal of the Korean Physical Society, **53**, 3073-3076 (2008).

27. *"Ultralong spin memory of optically excited single magnetic quantum dots,"* T. Gurung, S. Mackowski, H. E. Jackson, **L. M. Smith**, J. Kossut, and G. Karczewski, Applied Physics Letters **93**, 153114 (2008).

28. *"High Purity GaAs Nanowires Free of Planar Defects: Growth and Characterization,"* Hannah J. Joyce, Qiang Gao, H. Hoe Tan, Chennupati Jagadish, Yong Kim, Melodie A. Fickenscher, Saranga Perera, Thang Ba Hoang, **Leigh M. Smith**, Howard E. Jackson, Jan M. Yarrison-Rice, Xin Zhang, and Jin Zou. Advanced Functional Materials **18**, 1-7 (2008).

29. *"Nearly intrinsic lifetimes in twin-free GaAs/AlGaAs core-shell nanowire heterostructures,"* S. Perera, M.A. Fickenscher, H.E. Jackson, **L.M. Smith**, J.M. Yarrison-Rice, H.J. Joyce, Q. Gao, H.H. Tan, C. Jagadish, X. Zhang, and J. Zou, Applied Physics Letters **93**, 053110 (2008).

30. "*Polarized Photoluminescence and Time-resolved Photoluminescence from Single CdS Nanosheets*," T. B. Hoang, L. V. Titova, A. Mishra, **L. M. Smith**, H. E. Jackson, K-Y Lee, H. Rho, J.M. Yarrison-Rice, Y.-J. Choi, K. J. Choi, and J.-G. Park, Applied Physics Letters **92**, 143112 (2008).

31. *"Spatially-Resolved Photoluminescence Mapping of Single CdS Nanosheets,"* Heesuk Rho, Kyoung-Yeon Lee, Thang Ba Hoang, Lyubov V. Titova, Ashu Mishra, **Leigh M. Smith**, Howard E. Jackson, Jan M. Yarrison-Rice, Young-Jin Choi, Kyoung Jin Choi, and Jae Gwan Park, *Applied Physics Letters* **92**, 013111 *(2008).*

32. *"Tuning spin properties of excitons in single CdTe quantum dots by annealing,"* K.P. Hewaparakrama, S. Mackowski, H.E. Jackson, **L.M. Smith**, W. Heiss, and G. Karczewski, Nanotechnology **19**, 125706 (2008).

33. *"Resonant photoluminescence imaging and the origin of excited states in self-assembled quantum dots,"* T.A. Nguyen, S. Mackowski, T.B. Hoang, H.E. Jackson, **L.M. Smith**, J. Kossut, and G. Karczewski, Physical Review **B76**, 245320 (2007).

34. *"Polarization and Temperature Dependence of Photoluminescence from Zincblende and Wurtzite InP Nanowires,"* A. Mishra, L.V.Titova, T.B. Hoang, H.E. Jackson, and **L.M. Smith**, J.M. Yarrison-Rice, Yong Kim, H.J. Joyce, Q. Gao, H. Hoe Tan, and C. Jagadish, *Applied Physics Letters*, **91**, 263104 *(2007)*.

35. *"Dynamics of Strongly Degenerate Electron-Hole Plasmas and Excitons in Single InP Nanowires,"* Lyubov V. Titova,Thang Ba Hoang, Jan M. Yarrison-Rice, Howard E. Jackson, Yong Kim, Hannah J. Joyce, Qiang Gao, H. Hoe Tan, Chennupati Jagadish, Xin Zhang, Jin Zou, and **Leigh M. Smith**, Nano Letters **7**, 3383-3387 (2007).

36. "*Resonant Excitation and Imaging of Nonequilibrium Exciton Spins in Single Core-Shell GaAs-AlGaAs Nanowires*," Thang Ba Hoang, Lyubov V. Titova, Jan M. Yarrison-Rice, Howard E. Jackson, Alexandre O. Govorov, Y. Kim, H. J. Joyce, H.H. Tan, C. Jagadish and **Leigh M. Smith**, Nano Letters 7, 588-595 (2007).

37. *"Relaxation dynamics of bimodally distributed CdSe quantum dots,"* P. Bajracharya, T.A. Nguyen, S. Mackowski, **L.M. Smith**, H.P. Wagner, U.W. Pohl, D. Bimberg, and M. Strassburg, Physical Review B **75**, 035321-1-8 (2007).

38. *"Temperature-dependence of photoluminescence from single core-shell GaAs-AlGaAs nanowires,"* T.B. Hoang, L.V. Titova, J.M. Yarrison-Rice, H.E. Jackson, **L.M. Smith**, and C. Jagadish, Appl. Phys. Lett. **89**, 173126-1-3 (2006).

39. *"Temperature dependent photoluminescence of single CdS nanowires,"* T.B. Hoang, L.V. Titova, J.M. Yarrison-Rice, H.E. Jackson, **L.M. Smith**, J.L. Lensch, and L.J. Lauhon, Appl. Phys. Lett. **89**, 123123-1-3 (2006)**.**

40. *"Low temperature photoluminescence imaging and time-resolved spectroscopy of single CdS nanowires,"* L.V. Titova, T.B. Hoang, J.M. Yarrison-Rice, H.E. Jackson, **L.M. Smith**, J.L. Lensch, and L.J. Lauhon, *Appl. Phys. Lett.* **89**, 053119 (2006).

41. *"Resonant Raman Scattering from CdS Nanowires,"* A. Abdi, L. V. Titova, J.M. Yarrison-Rice, **L. M. Smith**, H. E. Jackson, J. L. Lensch, and L. J. Lauhon, Appl. Phys. Lett., 88, 043118, (2006).

42. L. V. Titova, Thang B. Hoang, H. E. Jackson, **L.M. Smith**, J.M. Yarrison-Rice, J.L. Lensch and L.J. Lauhon, " Low-Temperature Optical Characterization of Single CdS Nanowires," *Nanotechnology, 2006. IEEE-NANO 2006. Sixth IEEE Conference on*, **1**, 123-125 (2006).

43. A. Abdi, L.V. Titova, **L.M. Smith**, H.E. Jackson, J. M. Yarrison-Rice, J. L. Lensch and L. J. Lauhon, " Raman Spectroscopy as a Probe of Single Semiconductor Nanowires," *Nanotechnology, 2006. IEEE-NANO 2006. Sixth IEEE Conference on*, **1**, 137-139, (2006).

44. Thang B. Hoang, L. V. Titova, H. E. Jackson, **L.M. Smith**, J.M. Yarrison-Rice, Y. Kim, H. J. Joyce and C. Jagadish, " Imaging and optical properties of single core-shell GaAs-AlGaAs nanowires," *Nanotechnology, 2006. IEEE-NANO 2006. Sixth IEEE Conference on*, **1**, pp. 116-118 (2006)..

45. A. Abdi, L. V. Titova, **L. M. Smith**, H. E. Jackson, J. M. Yarrison-Rice, J. L. Lensch, and L. J. Lauhon, "Resonant Raman scattering from CdS nanowires," Appl. Phys. Lett. **88**, 043118 (2006).

46. A. Abdi, T. B. Hoang, S. Mackowski, **L. M. Smith**, H. E. Jackson, J. M. Yarrison-Rice, J. Kossut, and G. Karczewski, "Probing the excited state distributions of CdTe/ZnTe self-assembled quantum dots using resonant Raman scattering, " Appl. Phys. Lett. **87**, 183104 (2005).

47. S. Mackowski, T. Gurung, H. E. Jackson, **L. M. Smith**, G. Karczewski, and J. Kossut "Exciton-controlled magnetization in single magnetic quantum dots," Appl. Phys. Lett. 87, 072502 (2005)

48. S. Mackowski, T. Gurung, T.A. Nguyen, H.E. Jackson, **L.M. Smith**, G. Karczewski, J. Kossut, M. Dobrowolska, J.K. Furdyna, "Exciton Spin Relaxation in Symmetric Self-Assembled Quantum Dots", AIP Conference Proceedings 772, 1357 (2005)

49. K.P. Hewaparakrama, S. Mackowski, H.E. Jackson, **L.M. Smith**, G. Karczewski, J. Kossut, "Photoluminescence Imaging of CdTe/ZnTe Self-Assembled Quantum Dots", AIP Conference Proceedings 772, 711 (2005)

50. S. Mackowski, T. Gurung, H.E. Jackson, **L.M. Smith**, J. Kossut, G. Karczewski, "Optically Induced Magnetization of CdMnTe Quantum Dots", AIP Conference Proceedings **772**, 1327 (2005).

51. S. Mackowski, T. Gurung, F. Haque, T.A. Nguyen, H.E. Jackson, **L.M. Smith**, T. Schallenberg, K.Brunner, L.W. Molenkamp, "Spatial Diffusion of Carriers in a Quantum Dot System Grown by Shadow MaskControlled Epitaxy", AIP Conference Proceedings **772**, 657 (2005)

52. T.A. Nguyen, T.B. Hoang, S. Mackowski, H.E. Jackson, **L.M. Smith**, J. Wrobel, K. Fronc, J. Kossut, G. Karczewski, "Morphology of CdTe/ZnTe Self-Assembled Quantum Dots Studied by Excitation Spectroscopy", AIP Conference Proceedings **772**, 677 (2005)

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54. "*Subwavelength multichannel imaging using a solid immersion lens: Spectroscopy of excitons in single quantum dots*," K. P. Hewaparakrama, A. Wilson, S. Mackowski, H. E. Jackson, **L. M. Smith**, G. Karczewski, and J. Kossut, Appl. Phys. Lett. 85, 5463 (2004).

55. "*Optical studies of zero-field magnetization of CdMnTe quantum dots: Influence of average size and composition of quantum dots,*" T. Gurung, S. Mackowski, H. E.

Jackson, **L. M. Smith**, W. Heiss, J. Kossut, and G. Karczewski, J. Appl. Phys. 96, 7407 (2004).

56. "*Exciton spin relaxation in quasiresonantly excited CdTe/ZnTe self-assembled quantum dots,*" S. Mackowski, T. A. Nguyen, T. Gurung, K. Hewaparakrama, H. E. Jackson, **L. M. Smith**, J. Wrobel, K. Fronc, J. Kossut, and G. Karczewski Phys. Rev. B70, 245312 (2004).

57. "Resonant spectroscopy of II-VI self-assembled quantum dots: Excited states and exciton–longitudinal optical phonon coupling," T. A. Nguyen, S. Mackowski, H. E. Jackson, **L. M. Smith**, J. Wrobel, K. Fronc, G. Karczewski, J. Kossut, M. Dobrowolska, J. K. Furdyna, and W. Heiss Physical Review **B70**, 125306 (2004).

58. "Exciton-LO phonon interaction in II-VI self-assembled quantum dots," T.A. Nguyen, S. Mackowski, H.E. Jackson, **L.M. Smith**, G. Karczewski, J. Kossut, M. Dobrowolska, J.K. Furdyna, W. Heiss, Physica Status Solidi c **1**, 767-70 (2004).

59. "Optical studies of spin relaxation in CdTe self-assembled quantum dots," S. Mackowski, T. Gurung, T.A. Nguyen, K.P. Hewaparakrama, H.E. Jackson, **L.M. Smith**, J. Wrobel, K. Fronc, J. Kossut, G. Karczewski, Physica Status Solidi c **1**, 937-40 (2004).

60. "Optically controlled magnetization of zero-dimensional magnetic polarons in CdMnTe self-assembled quantum dots," S. Mackowski, T. Gurung, T.A. Nguyen, H.E. Jackson, **L.M. Smith**, J. Kossut, G. Karczewski, Physica Status Solidi b. **241**, 656-9 (2004).

61. "Optically-induced magnetization of CdMnTe self-assembled quantum dots," S. Mackowski, T. Gurung, T.A. Nguyen, H.E. Jackson, **L.M. Smith**, G. Karczewski, J. Kossut, Applied Physics Letters. **84**, 3337-9 (2004).

62. "Tuning the optical and magnetic properties of II-VI quantum dots by post-growth rapid thermal annealing," T. Gurung, S. Mackowski, H.E. Jackson, **L.M. Smith**, W. Heiss, J. Kossut, G. Karczewski, Physica Status Solidi b **241**, 652-5 (2004).

63. "Exciton Spin Relaxation Time in Quantum Dots Measured by Continuous-Wave Photoluminescence Spectroscopy", S. Mackowski, T. A. Nguyen, H. E. Jackson, **L. M. Smith**, J. Kossut, and G. Karczewski, Applied Physics Letters **83**, 5524-7 (2003).

64. "Tuning the Properties of Magnetic CdMnTe Quantum Dots", S. Mackowski, H.E. Jackson, **L.M. Smith**, W. Heiss, J. Kossut, and G. Karczewski, Applied Physics Letters **83**, 3575-9 (2003).

65. "Optical Properties of Annealed Self-Assembled CdTe Quantum Dots", S. Mackowski, **L.M. Smith**, H.E. Jackson, W. Heiss, J. Kossut, G. Karczewski, Applied Physics Letters **83**, 254 (2003).

66. "Nano-photoluminescence of CdSe self-assembled quantum dots: experiments and models," R.A. Jones, Jan M. Yarrison-Rice, **L.M. Smith**, Howard E. Jackson, M. Dobrowolska, and J.K. Furdyna, Physical Review **B 68**, 125333 (2003).

67. "Resonant and Non-Resonant Photoluminescence of CdSe/ZnSe and CdTe/ZnTe Self-Assembled Quantum Dots", T.A. Nguyen, S. Mackowski, H. Rho, L.M. Robinson, H.E. Jackson, **L.M. Smith**, S. Lee, M. Dobrowolska, J. Furdyna, G. Karczewski, Proceedings of the 26th International Conference on the Physics of Semiconductors ed. A R Long and J H Davies, Edinburgh 2002, Institute of Physics Conference Series **171**, H157 (2003). cond-mat/0309411

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75. "Exciton kinetics in self-assembled CdSe/ZnSe quantum dots," **L.M. Smith**, L.M. Robinson, H. Rho, H.E. Jackson, S. Lee, M. Dobrowolska, and J.K. Furdyna, *Quantum Electronics and Laser Science Conference (QELS 2000). Technical Digest. Postconference Edition. TOPS Vol.40 (IEEE Cat. No.00CH37089)*. 2000. p. 87.

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80. "Optical observation of quantum-dot formation in sub-critical CdSe layers grown on ZnSe," C.S. Kim, M. Kim, S. Lee, J.K. Furdyna, M. Dobrowolska, H. Rho, **L.M. Smith**, and H.E. Jackson, Journal of Crystal Growth **214-215**, 761 (2000).

81. "Origin of two types of excitons in CdSe dots on ZnSe," S. Lee, J.C. Kim, H. Rho, C.S. Kim, **L.M. Smith**, H.E. Jackson, J.K. Furdyna, and M. Dobrowolska, Physical Review **B61**, R2405 (2000).

82. "Quantum dots exciton dynamics through a nano-aperture: Evidence for two confined states," L.M. Robinson, H. Rho, J.C. Kim, Howard E. Jackson, **L.M. Smith**, S. Lee, M. Dobrowolska and J.K. Furdyna, Physical Review Letters **83**, 2797 (1999).

83. "Temperature-dependent micro-photoluminescence of individual CdSe self-assembled quantum dots," J.C. Kim, H. Rho, **L.M. Smith**, Howard E. Jackson, S. Lee, M. Dobrowolska and J.K. Furdyna, Applied Physics Letters **75**, 214 (1999).

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85. "Temperature- and Density-Dependent Transport of Mobile EMP in ZnMnSe/ZnSe Multiple Quantum Wells," by T.B. Sun, **L.M. Smith** and B.T. Jonker, *Proceedings of the*

24th International Conference of the Physics of Semiconductors, Jerusalem, August 1998, (World Scientific, Singapore 1999), CDROM.

86. "Exciton Spin-Relaxation through LO Phonon Emission in a ZnMnSe/ZnFeSe Multiple Quantum Well," by A.R. Hodges, **L.M. Smith** and B.T. Jonker, *Proceedings of the 24th International Conference of the Physics of Semiconductors, Jerusalem, August 1998,* (World Scientific, Singapore 1999), CDROM.

87. "Exciton Spin-Thermalization in Strained and Unstrained $Zn_{1-x}Mn_xSe$ Epilayers," by C.D. Poweleit, A.R. Hodges, T.B. Sun, **L.M. Smith** and B.T. Jonker, .Phys. Rev. **B59**, 7610 (1999).

88. **"**Spectroscopic characterization of the evolution of self-assembled CdSe quantum dots," J. C. Kim, H. Rho, **L. M. Smith**, and H. E. Jackson, S. Lee, M. Dobrowolska, J. L. Merz, and J. K. Furdyna, *Applied Physics Letters* **73**, 3399 (1998).

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90. "Driven Spin-Transport of Exciton Magnetic Polarons in ZnMnSe/ZnSe Quantum Wells," T.-B. Sun, G.A. Balchin, **L.M. Smith**, and B.T. Jonker, Phys. Stat. Sol. (a) **164**, 547 (1997).

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92. "Spin-Transport of Exciton Magnetic Polarons in $Zn_{1-x}Mn_xSe$/ZnSe Multiple Quantum Wells," G.A. Balchin, C.D. Poweleit, **L.M. Smith** & B.T. Jonker, in *Proceedings of the 23rd International Conference on the Physics of Semiconductors, Berlin* (World Scientific, Singapore, October 1996) p. 2055.

93. "Spin-Thermalization of Excitons in Zn(Cd,Mn,Fe)Se-Based Magnetic Quantum Wells," A.R. Hodges, C.D. Poweleit, **L.M. Smith** & B.T. Jonker, in *Proceedings of the 23rd International Conference on the Physics of Semiconductors, Berlin* (World Scientific, Singapore, October 1996) p. 2035.

94. "Time-Resolved Magneto-Photoluminescence of Confined Donors in GaAs/$Al_{0.3}Ga_{0.7}As$ Multiple Quantum Wells," G.A. Balchin, **L.M. Smith**, B.D. McCombe & A. Petrou, in *Proceedings of the 23rd International Conference on the Physics of Semiconductors, Berlin* (World Scientific, Singapore, October 1996) p. 2773.

95. "Spin dependent carrier localization in Fe-based semimagnetic semiconductor heterostructures, B.T. Jonker, H. Abad, W.Y. Yu, S. Stoltz, A. Petrou. J. Warnock, C.D. Poweleit, **L.M. Smith** and T. Schmiedel, Journal of Crystal Growth **159**, 947 (1996).

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99. "Time-resolved photoluminescence of electron-hole plasmas near the liquid-gas critical region in Si: Evidence for two condensed phases," **L.M. Smith** and J.P. Wolfe, Phys. Rev. **B51,** 7521 (1995).

100. "Spin- and energy-relaxation of excitons in strained and relaxed $Zn_{1-X}Mn_XSe$ epilayers," C.D. Poweleit, **L.M. Smith**, and B.T. Jonker, in *Proceedings of the 22nd International Conference on the Physics of Semiconductors, Vancouver (*World Scientific, Singapore, 1995), p. 2561.

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INVITED TALKS:

" Flipping the Classroom in an Algebra-based Physics Course at an Urban University," Leigh M. Smith, June 14, 20013, Department of Physics and Astronomy, Georgia State University, Atlanta, Georgia.

"Controlling and measuring the energy landscape in single semiconductor nanowire heterostructures," Leigh M. Smith, January 18, 2013, Department of Physics, Florida International University, Miami, Florida.

" Flipping the Classroom in an Algebra-based Physics Course at an Urban University," Leigh M. Smith, January 17, 20013, Department of Physics, Florida International University, Miami, Florida.

"Measuring the Electronic Properties of Single Semiconductor Nanowire Heterostructures Using Advanced Optical Spectroscopies" Leigh M. Smith, November 8, 2011,. Department of Physics, State University of New York at Buffalo.

"Measuring the Electronic Properties of Single Semiconductor Nanowire Heterostructures Using Advanced Optical Spectroscopies" Leigh M. Smith, October 10, 2011,. Department of Physics, Case Western Reserve University.

"Measuring the Electronic Properties of Single Semiconductor Nanowire Heterostructures Using Advanced Optical Spectroscopies" Leigh M. Smith, September 16, 2011,. Department of Physics, Lund University, Lund, Sweden.

"Measuring the Electronic Properties of Single Semiconductor Nanowire Heterostructures Using Advanced Optical Spectroscopies" Leigh M. Smith, September 14, 2011,. Department of Physics, University of Copenhagen, Copenhagen, Denmark.

"Measuring the Electronic Properties of Single Semiconductor Nanowire Heterostructures Using Advanced Optical Spectroscopies" Leigh M. Smith, September 12, 2011,. Department of Physics, Norwegian University of Science and Technology, Trondheim, Norway.

"Measuring the Electronic Properties of Single Semiconductor Nanowire Heterostructures Using Advanced Optical Spectroscopies" Leigh M. Smith, September 5, 2011,. École Polytechnique Fédérale de Lausanne (EPFL), Lausannne Switzerland.

"Measuring the Electronic Properties of Single Semiconductor Nanowire Heterostructures Using Advanced Optical Spectroscopies" Leigh M. Smith, Keynote Speaker, WELCOME Scientific Meeting on Hybrid Nanostructures, August 28-31, 2011, Nicolaus Copernicus University, Torun, Poland.

" Tuning the Optical Properties of Semiconductor Nanowire Heterostructures," Invited Talk, 2010 Progress in Electromagnetics Research Symposium, July 5-8, 2010. Boston, MA.

"Quantum Phenomena in Semiconductor Nanowire Heterostructures," Invited Talk, 2009 MRS Fall Meeting, November 30 - December 4, 2009.

"Quantum Phenomena in Semiconductor Nanowire Heterostructures," Invited Talk, 2009 Villa Conference on Interactions Among Nanostructures, St. Thomas, US Virgin Islands, September 6-11, 2009.

"Probing the electronic and spin properties of single semiconductor nanowires," Invited Talk, The 136th Annual Meeting of the Minerals, Metals and Materials Society, February 25-March 1, 2007.

"Probing the electronic and spin properties of single semiconductor nanowires," Colloquium, Department of Physics, University of Dayton, November 17, 2006.

"Probing the electronic and spin properties of single semiconductor nanostructures: From dots to wires," Colloquium, Department of Physics, Ohio University, May 11, 2006.

"Controlling nanomagnets with light," Invited Talk, Midwest Solid State Conference, October 30-31, 2004.

"Using exciton dynamics to probe the internal structure of CdSe/ZnSe self-assembled quantum dots," Seminar, Department of Physics, University of Lund, Sweden, February 2000.

"Using exciton dynamics to probe the internal structure of CdSe/ZnSe self-assembled quantum dots," Seminar, Research Center COM, Technical University of Denmark, September 1999.

"Using optics to probe excitons in CdSe self-assembled quantum dots," Colloquium, Department of Physics, State University of New York at Buffalo, April 1999.

"Using optics to probe excitons in CdSe self-assembled quantum dots," Solid State Seminar, Department of Physics, Ohio University, April 1999.

"Population Inversion of Spin-Polarized Excitons in ZnMnSe/ZnFeSe Quantum Wells," Solid State Seminar, Department of Physics, University of Notre Dame, February 1999.

"Population Inversion of a Spin-Polarized Excition Gas in ZnMnSe/ZnFeSe multiple quantum wells," Solid State Seminar, Department of Physics, Purdue University, November 1997.

"Spin-transport of Exciton Magnetic Polarons in ZnMnSe/ZnSe multiple quantum wells," Solid State Seminar, Department of Physics, McMaster University, April 1997.

"Spin-transport of Exciton Magnetic Polarons in ZnMnSe/ZnSe multiple quantum wells," Solid State Seminar, Department of Physics, University of Pittsburgh, December 1996.

"Spin-Dynamics in $Zn_{1-x}Mn_xSe$ epilayers," Colloquium, State University of New York at Buffalo, Dept. of Physics, May 1992

"Observation of Long-Lived Magneto-Polarons in $Zn_{1-x}Mn_xSe$/ZnSe Quantum Wells," Solid State Seminar, Ohio State University, Department of Physics, May 1992

"Radiative recombination and carrier lifetimes in surfacefree GaAs homostructures," Symposium of the Materials Research Society, Boston, 1989.

EXTERNAL GRANTS:

"University of Cincinnati's Proposal to Become a Comprehensive PhysTEC Site," Kathy Koenig, Kay Kinoshita, Helen Meyer, Mark Plano-Clark, and Leigh M. Smith, National Science Foundation, Division of Undergraduate Education, $299,775, 9/2013 to 8/2017.

"A Coherent Multi-disciplinary Initiative to Enhance Student Learning in STEM Courses," Howard E. Jackson, Warren Huff, Guy Cameron, Bruce Ault, C. David Minda, Leigh M. Smith, National Science Foundation, Division of Undergraduate Education, $249,648, 8/2010 to 7/2014.

"Collaborative Research: Dynamical Processes in Semiconductor Nanowires in the Quantum Regime," Leigh M. Smith and Howard E. Jackson (UC) and Jan Yarrison-Rice

(Miami University). National Science Foundation, Division of Materials Research, $345,928, 9/2011 to 8/2014.

"A Novel Photovoltaic Device Using Type II Tunable Core-shell Nanowires," Leigh M. Smith, Howard E. Jackson and Jan Yarrison-Rice. National Science Foundation, Engineering Division, $350,000, 8/2011 to 7/2014.

"Materials World Network: Collaborative Research: Exploring Reduced-Dimensional Behavior of Excitations in Tailored Semiconductor Nanowire Heterostructures," National Science Foundation through the Materials World Network Program: NSF DMR-0806700, Leigh M. Smith and Howard E. Jackson, $396,000. NSF DMR-0806572, Jan Yarrison-Rice, $96,000. 9/1/2008-8/31/2011.

"An Ultrasensitive Biosensor Integrating Semiconductor Nanowires with Plasmonic Resonators," National Science Foundation. Leigh M. Smith, Howard Jackson and Jan Yarrison-Rice, $330,750, 7/1/2007-6/30/2010.

" NUE: Integration of Nanoscale Science and Engineering into Undergraduate Curricula," National Science Foundation under the NUE program. T. Mantei, F. Gerner, S. Iyer, and L.M. Smith, 200,000, $175,000 9/15/2005-9/14/2007.

"Acquisition of an e-beam lithography system for nanoscale science and engineering," National Science Foundation under the MRI program, NSF DMR-0216374. $1,200,000 8/1/2002-8/1/2006, L.M. Smith and A. Steckl, Co-Principal Investigators

"Exciton Dynamics and the Electronic Structure of CdSe/ZnSe Quantum Dots," National Science Foundation, NSF DMR-0071797, $270,000 over 3 years, L.M. Smith and H.E. Jackson Co-Principal Investigators, August 2000 – July 2003.

"Acquisition of an ultrafast laser system and near-field spectrometer for investigating II-VI quantum dots," NSF DMR-9975655, $360,000 over one year, L.M. Smith and H.E. Jackson Co-Principal Investigators, August 1999 – August 2000.

"Spin-Transport and Dynamics of Excitons in Magnetic Quantum Heterostructures," National Science Foundation Grant, # DMR-9705443. $254,000 over 3 years, L.M. Smith, Principal Investigator, August 1997 — August 2000.

"Spin-Dynamics of Mn- and Fe-Based ZnSe Magnetic Heterostructures," National Science Foundation Grant, # DMR-9409049. $240,000 over 3 years, L.M. Smith, Principal Investigator, September 1994 — September 1997.

"Acquisition of Time-Resolved Near-Field Spectrometer," National Science Foundation Grant #DMR 95-03853. $50,000, Howard E. Jackson, Joseph T. Boyd and Leigh M. Smith, principal investigators, September 1995 — September 1996.

"GAANN Program Fellowships in Physics," Department of Education, Frank Pinski (Principal Investigator), Richard Gass, Mark Jarrell, Howard Jackson, Leigh M. Smith, and Michael Ma, $490,000, September 1995—September 1998.

INTERNAL GRANTS:

"Distance Learning in the Sciences – New Tools for the Classroom and Beyond," UC|21 Distance Learning Seed Grant, $22,000, Howard Jackson, Leigh Smith and Warren Huff.

"A New Nanowire/Plasmonic Ultrasensitive Biosensor," Nano Institute Interdiscplinary Seed Grant, $30,000, Howard Jackson, Leigh Smith, Jan Yarrison-Rice, and Ian Papautsky

GRADUATE AND UNDERGRADUATE STUDENT TRAINING:

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Lyubov Titova (University of Alberta)
Sebastian Mackowski (Profesor at Copernicus University in Poland)
Nathalie Mukolobwiez (Teacher at Walnut Hills High School)
James Kim (Research Scientist at LumiLeds/Phillips)

Ph.D. Thesis Advisor to:

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Yuda Wang (current)
Teng Shi (current)
Mohammad Montazeri (PhD, 2012, Postdoc at UCLA)
Karunananda Pemasiri (PhD, 2013)
Parveen Kumar (PhD, 2013, Postdoc at Ohio State University)
Saranga Perera (Ph.D. 2012, Faculty at University of Ruhuna, Sri Lanka)
Melodie Fickenscher (Ph.D. 2011, Research staff at University of Cincinnati)
Amir Maharjan (PhD. 2009, now faculty at Rochester Institute of Technology)
Thang Ba Hoang (PhD, March 2008, Postdoc at Duke University)
Tak Gurung (PhD, August 2006, Asst. Professor at San Antonio College)
Amensisa Abdi (PhD, August 2006, Asst. Prof. Eastern Iowa Comm. College.)
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Laurie Robinson (PhD, December 2000, now at Coherent Lasers, Inc.)
Alex Hodges (PhD, December 2000, now at University of Vermont)
Tseng Bao Sun (PhD, August 1999, Unknown)
Greg Balchin (PhD September 1996, now Naval Research Laboratory)
C.D. Poweleit, (PhD March 1995, now at Arizona State University)

Undergraduate Research Advisor to:

Elliot Good (Currently at UC)
Daniel Erbland (Currently at UC)
Daniel Rose (Graduate Electric Engineering, UC)
Joshua Nohle (Graduate Physics, UCLA)
Tony Wilson (Now at Wright Patterson AF Base)
James Armstrong (Now at University of Florida)
Beth Chitwood (AFIT/WPAFB)
Ali Lowey (Boston University)
Lynne Vettel (WPAFB)
Dona-Lyn Coombe
Alex Gose
Adnan Jaigirdar (Chief Resident of Surgery at UC San Francisco)
David Posson (Postdoc University of Illinois, Department of Physics)