

## WOUNJHANG PARK

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### EDUCATION

1. **GEORGIA INSTITUTE OF TECHNOLOGY**, Atlanta, GA  
*Ph.D. in Physics* (June 1997)  
Thesis: Optical Properties of Thin Film Phosphors, Advisor: Prof. Christopher J. Summers
2. **DONGGUK UNIVERSITY**, Seoul, KOREA  
*M.S. in Physics* (August 1991)  
Thesis: Interface-Related Defects in  $\text{Ge}_{0.4}\text{Si}_{0.6}/\text{Si}$  Single Quantum Well, Advisor: Prof. Tae W. Kang
3. **SEOUL NATIONAL UNIVERSITY**, Seoul, KOREA  
*B.S. in Physics* (February 1989)

### EXPERIENCE

1. **UNIVERSITY OF COLORADO AT BOULDER** (2008 - Present)  
*Associate Professor of Electrical & Computer Engineering*  
Design, modeling, fabrication and characterizations of new nanostructures and nanoscale devices based on photonic crystal structure. Development of metallic nanostructures and metamaterial structures. Development of nanophotonic devices for biomedical applications. Development of new phosphor materials based on nanostructures. Teaching and developing courses on solid-state devices, optical materials and nanomaterials.
2. **UNIVERSITY OF COLORADO AT BOULDER** (2001 - 2008)  
*Assistant Professor of Electrical & Computer Engineering*  
Design, modeling, fabrication and characterizations of new nanostructures and nanoscale devices based on photonic crystal structure. Development of metallic nanostructures and metamaterial structures. Development of nanophotonic devices for biomedical applications. Development of new phosphor materials based on nanostructures. Teaching and developing courses on solid-state devices, optical materials and nanomaterials.
3. **GEORGIA TECH RESEARCH INSTITUTE** (1998 - 2001)  
*Research Scientist II*  
Design and fabrication of photonic crystal structures. Development of new quantum cutter phosphors for plasma displays. Development of new surface modification techniques for phosphors for low voltage field emission displays. Development of new electroluminescent device structures. Spectroscopy of electroluminescent, cathodoluminescent, and photoluminescent phosphors. Theoretical modeling of luminescent centers and their interactions with crystalline environment. Modeling of electro-optical properties of display devices. Supervised a laser spectroscopy lab, a phosphor synthesis lab and graduate students. Participated in teaching courses on electronic materials and on photonic and opto-electronic materials at the School of Materials Science & Engineering.
4. **GEORGIA TECH RESEARCH INSTITUTE** (1997 - 1998)  
*Post-doctoral Fellow*  
Spectroscopic studies of phosphor materials for flat panel displays. Optical and electrical characterizations of phosphors. Crystal field and molecular orbital theory analysis of electronic structures of localized luminescent centers. Theoretical analysis of interaction between luminescent centers in phosphors. Supervised a spectroscopy lab and graduate students.
5. **GEORGIA INSTITUTE OF TECHNOLOGY** (1994 - 1997)

*Graduate Research Assistant*

Optical characterizations of phosphor materials for flat panel displays by photoluminescence, photoluminescence excitation, and time-resolved spectroscopy. Development of theoretical models for electronic structures of transition metal and rare earth ions in solids and excitation energy transfer phenomena in phosphors.

6. **GEORGIA INSTITUTE OF TECHNOLOGY** (1993 - 1994)  
*Graduate Teaching Assistant* – supervised sophomore physics laboratory classes.

**RESEARCH GRANTS AWARDED**

1. *Title:* SBIR: 3-D Photonic Band Gap Materials and Devices from Self-Organized Anodic Alumina with Modulated Morphology  
*Funding Agency:* National Science Foundation  
*Role:* Senior Researcher (PI: D. Routkevitch, Nanomaterials Corp., Longmont, CO)  
*Amount:* \$18,500 (A subcontract from Nanomaterials Corp.)  
*Period:* Jul. 2002 – Dec. 2002.
2. *Title:* NER: Flexible Photonic Crystal - A New Pathway to Tunability  
*Funding agency:* National Science Foundation  
*Role:* Principal Investigator (co-PI: J.-B. Lee, University of Texas at Dallas)  
*Amount:* \$70,000 (Total Funding: \$100,000)  
*Period:* Jun. 2003 – Jun. 2004.
3. *Title:* NIRT: 3D Nano-Manufacturing Processes for Nanophotonic Devices and Systems  
*Funding Agency:* National Science Foundation  
*Role:* Co-Principal Investigator (PI: R. Piestun, co-PIs: B. Van Zeghbroeck, S. George, University of Colorado at Boulder)  
*Amount:* \$200,000 (Total Funding: \$1,000,000)  
*Period:* Aug. 2003 – Jul. 2007.
4. *Title:* Photonics Technology Access Program  
*Funding Agency:* National Science Foundation and Defense Advanced Research Projects Agency  
*Role:* Principal Investigator  
*Amount:* Two prototype (not available commercially) tunable lasers by Agility Communications Inc.  
*Period:* Delivered in Oct., 2004.
5. *Title:* High Performance Phosphor Materials Based on Photonic Crystal Structures  
*Funding Agency:* Daejoo Electronic Materials Co. (Shiheung, Korea)  
*Role:* Principal Investigator  
*Amount:* \$199,963  
*Period:* Jan. 2005 – Dec. 2009.
6. *Title:* Nanoshells for Cancer Imaging and Treatment  
*Funding Agency:* University of Colorado Cancer Center  
*Role:* Principal Investigator  
*Amount:* \$15,000  
*Period:* Feb. 2005 – Dec. 2005.
7. *Title:* Detecting Malignant Melanoma with Nanoprobes  
*Funding Agency:* CU Genomics-Biotechnology Initiative (Butcher Award)  
*Role:* Principal Investigator (co-PI: L. Bemis, University of Colorado Health Sciences Center)  
*Amount:* \$50,000 (Total Funding: \$100,000)  
*Period:* Sep. 2005 – Aug. 2006.

8. *Title:* MURI: Tunable and Reconfigurable Optical Negative-Index Materials with Low Losses  
*Funding Agency:* Army Research Office  
*Role:* Co-Principal Investigator (PI: V. Shalaev, Purdue, co-PIs: E. Narimanov, Purdue, I. Gabitov, Arizona, X. Zhang, Berkeley, I.-C. Khoo, Penn State)  
*Amount:* \$808,333 (Total Funding: \$5.5M)  
*Period:* Aug. 2006 – Aug. 2011.
9. *Title:* NIRT: Active Nanostructure Enabled On-Chip Spectroscopy System for Cancer Detection  
*Funding Agency:* National Science Foundation  
*Role:* Principal Investigator (co-PIs: L. Bemis, W. Robinson, University of Colorado at Denver and Health Sciences Center, J.-B. Lee, University of Texas at Dallas)  
*Amount:* \$435,320 (Total Funding: \$1.1M)  
*Period:* Sep. 2006 – Aug. 2010.
10. *Title:* Metamaterial-loaded antennas for chip-to-chip communications  
*Funding Agency:* DARPA/iMINT Center  
*Role:* Principal Investigator (co-PIs: William Rippard, Stephen Russek, and Pavel Kabos, National Institute of Standards and Technology at Boulder)  
*Amount:* \$100,000  
*Period:* May 2007 – Apr. 2009.
11. *Title:* Ultralow Index of Refraction Metamaterials for Optical Cloaking and Integration  
*Funding Agency:* University of Colorado Innovative Grant Program  
*Role:* Principal Investigator (co-PI: R. Piestun, University of Colorado at Boulder)  
*Amount:* \$25,000 (Total Funding: \$50,000)  
*Period:* Jul. 2007 – Jun. 2009.
12. *Title:* Nonlinear Optical Metamaterials from Co-doping of Metal Nanoparticles and Chromophores in Glassy Polymer Hosts  
*Funding Agency:* University of Colorado Innovative Grant Program  
*Role:* Co-Principal Investigator (PI: A. Mickelson, University of Colorado at Boulder)  
*Amount:* \$25,000 (Total Funding: \$50,000)  
*Period:* Jul. 2007 – Jun. 2008.
13. *Title:* Quantum Dot Arrays for Tunable Bandgap Properties  
*Funding Agency:* DARPA (subcontract from RavenBrick LLC)  
*Role:* Principal Investigator  
*Amount:* \$29,000  
*Period:* Apr. 2008 – Dec. 2008.
14. *Title:* Active Plasmonics for Target Suppression and Control  
*Funding Agency:* Office of Naval Research  
*Role:* Co-Principal Investigator (PI: A. Mickelson, University of Colorado at Boulder)  
*Amount:* \$299,950 (Total Funding: \$599,900)  
*Period:* Jun. 2008 – May 2011.
15. *Title:* EMT/NANO: Broadcast Optical Interconnects for Global Communication in Many-Core Chip-Multiprocessor  
*Funding Agency:* National Science Foundation  
*Role:* Co-Principal Investigator (PI: A. Mickelson, University of Colorado at Boulder)  
*Amount:* \$200,000 (Total Funding: \$1.05M)  
*Period:* Sep. 2008 – Aug. 2011.
16. *Title:* Nanoprobes and Integrated Nanodevices for Cancer Detection and Treatment  
*Funding Agency:* National Institute of Health

*Role:* Principal Investigator

*Amount:* \$28,399 (with University of Colorado Denver matching \$18,357)

*Period:* Sep. 2008 – Aug. 2009.

17. *Title:* I2CAM Junior Exchange Award - Nanoparticle alignment, assembly and positioning in liquid crystals explored using quantum dots, rods and multipods

*Funding Agency:* Institute of Complex Adaptive Matter

*Role:* Principal Investigator

*Amount:* \$17,632

*Period:* Sep. 2008 – Aug. 2009.

18. *Title:* Gold Nanoparticle-based Delivery of siRNA against Metabolic Genes in Head and Neck Cancer

*Funding Agency:* University of Colorado Cancer Center

*Role:* Co-Principal Investigator (PI: A. Jimenez, University of Colorado Denver)

*Amount:* \$20,000

*Period:* Sep. 2008 – Aug. 2009.

## **PUBLICATIONS** \*

### **Book Chapters**

1. W. Park, “Modeling of photonic crystals”, in *Handbook of Theoretical and Computational Nanotechnology Vol. 7*, ed. by M. Rieth and W. Schommers (American Scientific Publishers, Stevenson Ranch, CA, 2006), pp. 263-327.

### **Peer-Reviewed Journal** †

1. T. K. Tran, W. Park, J. W. Tomm, B. K. Wagner, S. M. Jacobsen, C. J. Summers, P. N. Yocom, and S. K. McClelland, “Photoluminescence Properties of ZnGa<sub>2</sub>O<sub>4</sub>:Mn Phosphor Powders”, *J. Appl. Phys.* **78**, 5691-5695 (1995) - Conducted photoluminescence spectroscopy and provided key theoretical modeling and analysis.
2. T. Yang, B. K. Wagner, M. Chaichimansour, W. Park, Z. L. Wang, and C. J. Summers, “Molecular Beam Epitaxy Growth of Strontium Thiogallate”, *J. Vac. Sci. & Technol. B* **14**, 2263-2266 (1996) - Conducted photoluminescence spectroscopy.
3. W. Tong, B. K. Wagner, T. K. Tran, W. Ogle, W. Park, and C. J. Summers, “Kinetics of Chemical Beam Epitaxy for High Quality ZnS Film Growth”, *J. Cryst. Growth* **164**, 202-207 (1996) - Conducted photoluminescence spectroscopy.
4. C. J. Summers, W. Tong, T. K. Tran, W. Ogle, W. Park, and B. K. Wagner, “Photoluminescence Properties of ZnS Epilayers Grown by Metalorganic Molecular Beam Epitaxy”, *J. Cryst. Growth* **159**, 64-67 (1996) - Conducted photoluminescence spectroscopy.
5. W. Tong, T. K. Tran, W. Park, B. K. Wagner, and C. J. Summers, “High-Quality ZnS Thin Film Growth for Flat Panel Display”, *J. SID* **4**, 325-329 (1996) - Conducted photoluminescence spectroscopy and provided theoretical analysis.

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\* For articles with multiple authors, the general rule on the order of the authors is as follows. First author made a major contribution, led and coordinated the collaboration and put together the manuscript. Second and third authors made major contributions, played significant roles in the collaboration and wrote portions of the manuscript. Others made substantial but partial contributions and played minor roles in the collaborations. An important exception is the advisor whose students are the leading authors, in which case the advisor also made a major contribution.

† My contribution is briefly described for each article. Authors for whom I was the principal advisor are underlined. Article 35 and later are published after I moved to the University of Colorado.

6. T. Yang, M. Chaichimansour, W. Park, B. K. Wagner, and C. J. Summers, "MBE Growth and Characterization of SrGa<sub>2</sub>S<sub>4</sub>:Ce Blue Phosphor for Thin Film Electroluminescence", *J. SID* **4**, 311-313 (1996) - Conducted photoluminescence spectroscopy and provided theoretical analysis.
7. T. K. Tran, W. Park, W. Tong, M. M. Kyi, B. K. Wagner, and C. J. Summers, "Photoluminescence Properties of ZnS Epilayers", *J. Appl. Phys.* **81**, 2803-2809 (1997) - Conducted photoluminescence spectroscopy and provided key theoretical modeling analysis.
8. W. Tong, L. Zhang, W. Park, M. Chaichimansour, B. K. Wagner, and C. J. Summers, "Charge Compensation Study of Molecular Beam Epitaxy Grown SrS:Ce", *Appl. Phys. Lett.* **71**, 2268-2270 (1997) - Conducted photoluminescence spectroscopy and provided theoretical analysis.
9. S. Schön, M. Chaichimansour, W. Park, T. Yang, B. K. Wagner, and C. J. Summers, "Homogeneous and  $\delta$ -doped ZnS:Mn Grown by MBE", *J. Cryst. Growth* **175/176**, 598-602 (1997) - Conducted photoluminescence spectroscopy measurements and provided theoretical analysis.
10. W. Tong, T. Yang, W. Park, M. Chaichimansour, B. K. Wagner, and C. J. Summers, "Gas Source MBE Growth of SrS:Ce for Flat Panel Display", *J. Electron. Mater.* **26**, 728-731 (1997) - Conducted photoluminescence spectroscopy and provided theoretical analysis.
11. W. Park, T. C. Jones, W. Tong, S. Schön, M. Chaichimansour, B. K. Wagner, and C. J. Summers, "Luminescence Decay Kinetics in Homogeneously- and Delta-Doped ZnS:Mn", *J. Appl. Phys.* **84**, 6852-6858 (1998) - Conducted extensive photoluminescence spectroscopy and extensive theoretical modeling and analysis.
12. W. Park, T. C. Jones, W. Tong, S. Schön, M. Chaichimansour, B. K. Wagner, and C. J. Summers, "Energy Transfer Processes and Photoluminescence Properties of Homogeneously- and Delta-Doped ZnS:Mn", *J. Cryst. Growth* **184/185**, 1123-1127 (1998) - Conducted extensive photoluminescence spectroscopy and extensive theoretical modeling and analysis.
13. P. D. Rack, M. D. Potter, S. Kurinec, W. Park, J. Penczek, B. K. Wagner, and C. J. Summers, "Luminescence Properties of Thin Film Ta<sub>2</sub>Zn<sub>3</sub>O<sub>8</sub> and Mn<sup>2+</sup> doped Ta<sub>2</sub>Zn<sub>3</sub>O<sub>8</sub>", *J. Appl. Phys.* **84**, 4466-4470 (1998) - Conducted photoluminescence spectroscopy.
14. P. D. Rack, J. S. Lewis, P. H. Holloway, W. Park, B. K. Wagner, C. J. Summers, "Bound Exciton Luminescence in Te-Doped SrS", *J. Appl. Phys.* **84**, 3676-3683 (1998) - Conducted photoluminescence spectroscopy.
15. W. Tong, T. Yang, M. Chaichimansour, W. Park, B. K. Wagner, C. J. Summers, S.-S. Sun, and C. N. King, "Electroluminescent SrS:Ce Thin Films Grown by Gas-Source MBE", *J. SID* **6**, 29-33 (1998) - Conducted photoluminescence spectroscopy.
16. S. Schön, M. Chaichimansour, W. Park, T. Yang, B. K. Wagner, and C. J. Summers, "Improved Photoluminescence Properties of ZnS:Mn due to the  $\delta$ -doping Process", *J. SID* **6**, 67-71 (1998) - Conducted photoluminescence spectroscopy and provided theoretical analysis.
17. W. Park, T. C. Jones, B. K. Wagner and C. J. Summers, "Multilayer Stacked Electroluminescent Devices", *Appl. Phys. Lett.* **74**, 2860-2862 (1999) - Invented new device concept and conducted device modeling.
18. W. Park, T. C. Jones and C. J. Summers, "Optical Properties of SrS:Cu,Ag Two-Component Phosphors for Electroluminescent Devices", *Appl. Phys. Lett.* **74**, 1785-1787 (1999) - Conducted extensive photoluminescence spectroscopy and provided theoretical analysis.
19. T. C. Jones, W. Park, and C. J. Summers, "A Two-Component Phosphor Approach for Engineering Electroluminescent Phosphors", *Appl. Phys. Lett.* **75**, 2398-2400 (1999) - Conducted extensive photoluminescence spectroscopy and provided theoretical analysis.
20. Y. B. Xin, W. Tong, W. Park, M. Chaichimansour, and C. J. Summers, "Annealing Studies of Molecular Beam Epitaxial Grown SrS:Cu Blue Phosphors", *J. Appl. Phys.* **85**, 3999-4002 (1999) - Conducted photoluminescence spectroscopy and provided theoretical analysis.

21. W. Tong, Y. B. Xin, W. Park, and C. J. Summers, "In Situ Annealing Studies of Molecular Beam Epitaxial Growth of SrS:Cu", *Appl. Phys. Lett.* **74**, 1379-1381 (1999) - Conducted photoluminescence spectroscopy and provided theoretical analysis.
22. B. Shen, Y. G. Zhou, Z. Z. Chen, P. Chen, R. Zhang, Y. Shi, Y. D. Zheng, W. Tong, and W. Park, "Growth of Wurtzite GaN Films on  $\alpha$ -Al<sub>2</sub>O<sub>3</sub> Substrates Using Light-Radiation Heating Metal-Organic Chemical Vapor Deposition", *Appl. Phys. A* **68**, 593-596 (1999) - Conducted photoluminescence spectroscopy.
23. W. Park, B. K. Wagner, G. Russell, K. Yasuda, C. J. Summers, Y. R. Do and H. G. Yang, "Thin SiO<sub>2</sub> Coating on ZnS Phosphors for Improved Low Voltage Cathodoluminescence Properties", *J. Mater. Res.* **15**, 2288-2291 (2000) - Made materials, conducted cathodoluminescence spectroscopy and provided theoretical analysis.
24. W. Park, R.-Y. Lee, C. J. Summers, Y. R. Do and H. G. Yang, "Photoluminescence Properties of Al<sub>3</sub>Gd<sub>2</sub>B<sub>4</sub>O<sub>12</sub>:Eu Phosphors", *Mater. Sci. Eng. B* **78**, 28-31 (2000) - Made materials, conducted photoluminescence spectroscopy and provided theoretical analysis.
25. W. Park, K. Yasuda, B. K. Wagner, C. J. Summers, Y. R. Do and H. G. Yang, "Uniform and Continuous Y<sub>2</sub>O<sub>3</sub> Coating on ZnS Phosphors", *Mater. Sci. Eng. B* **76**, 122-126 (2000) - Made materials and conducted cathodoluminescence spectroscopy.
26. W. Park, T. C. Jones, and C. J. Summers, "A Spectroscopic Study on SrS:Cu,Ag Two-Component Electroluminescent Phosphors", *J. Lumin.* **87-89**, 1267-1270 (2000) - Conducted extensive photoluminescence spectroscopy and provided theoretical analysis.
27. W. Park, T. C. Jones, W. Tong, B. K. Wagner, C. J. Summers, and S.-S. Sun, "Luminescent Properties of a New Blue EL Phosphor, SrS:Cu", *J. SID. Suppl.-1*, 47 (2000) - Conducted extensive photoluminescence spectroscopy and provided theoretical analysis.
28. C. J. Summers, B. K. Wagner, W. Tong, W. Park, Y. B. Xin and M. Chaichimansour, "Recent Progress in the Development of Full Color SrS-Based Electroluminescent Phosphors", *J. Cryst. Growth* **214/215**, 918-925 (2000) - Conducted photoluminescence spectroscopy and provided theoretical analysis.
29. S. W. Lu, B. I. Lee, Z. I. Wang, W. Tong, B. K. Wagner, W. Park and C. J. Summers, "Synthesis and Photoluminescence Enhancement of Mn<sup>2+</sup>-doped ZnS Nanocrystals", *J. Lumin.* **92**, 73-78 (2000) - Conducted photoluminescence spectroscopy.
30. W. Tong, M. Chaichimansour, W. Park, B. K. Wagner, C. J. Summers, S.-S. Sun, C. N. King, W. L. Warren, "Molecular Beam Epitaxy Growth of SrS Blue Electroluminescent Phosphors", *J. SID. Suppl.-1*, 69 (2000) - Conducted photoluminescence spectroscopy and provided theoretical analysis.
31. Y. B. Xin, W. Tong, Z. L. Wang, W. Park and C. J. Summers, "Oxidation and Diffusion of Cu in SrS:Cu Grown by MBE for Blue Phosphors", *Displays* **21**, 89-92 (2000) - Conducted photoluminescence spectroscopy and provided theoretical analysis.
32. W. Tong, Y. B. Xin, T. C. Jones, W. Park and C. J. Summers, "Codoping Studies of Molecular Beam Epitaxial Growth of SrS:Cu", *Displays* **21**, 83-87 (2000) - Conducted photoluminescence spectroscopy and provided theoretical analysis.
33. P. D. Rack, J. J. Peterson, M. D. Potter and W. Park, "Eu<sup>+3</sup> and Cr<sup>+3</sup> Doping for Red Cathodoluminescence in ZnGa<sub>2</sub>O<sub>4</sub>", *J. Mater. Res.* **16**, 1429-1433 (2001) - Conducted photoluminescence spectroscopy.
34. S. W. Lu, T. Copeland, B. I. Lee, W. Tong, B. K. Wagner, W. Park and F. Zhang, "Synthesis and Luminescence Properties of Mn<sup>2+</sup> doped Zn<sub>2</sub>SiO<sub>4</sub> phosphors by a Hydrothermal Method", *J. Phys. Chem. Solids* **62**, 777-781 (2001) - Conducted photoluminescence spectroscopy.
35. Y. R. Do, D. H. Park, H. G. Yang, W. Park, B. K. Wagner, K. Yasuda and C. J. Summers, "Uniform Nano-Scale SiO<sub>2</sub> Encapsulation of ZnS Phosphors for Improved Aging Properties under Low Voltage Electron Beam Excitation", *J. Electrochem. Soc.* **148**, G548-551 (2001) - Made materials and provided theoretical analysis.

36. W. Park and C. J. Summers, “Extraordinary Refraction and Dispersion in 2D Photonic Crystal Slabs”, *Opt. Lett.* **27**, 1387-1389 (2002) - Designed new nanostructure and conducted simulations.<sup>‡</sup>
37. W. Park, J. S. King, C. W. Neff, C. Liddell and C. J. Summers, “ZnS-Based Photonic Crystals”, *Phys. Stat. Sol. (b)* **229**, 949-960 (2002) - Made materials, conducted simulations and optical characterizations.
38. W. Park, C. J. Summers, Y. R. Do and H. G. Yang, “Photoluminescence Properties of the Red Emitting BaGdB<sub>9</sub>O<sub>16</sub>:Eu Phosphor”, *J. Mater. Sci.* **37**, 4041-4045 (2002) - Made materials, conducted photoluminescence spectroscopy and provided theoretical analysis.
39. C. J. Summers, C. W. Neff and W. Park, “Active photonic crystal nano-architectures”, *J. Nonlinear Opt. Phys. Mater.* **12**, 587-597 (2003) - Designed new nanostructure and conducted simulations.
40. J. S. King, C. W. Neff, C. J. Summers, W. Park, S. Blomquist, E. Forsythe and D. Morton, “High-filling-fraction inverted ZnS opals fabricated by atomic layer deposition”, *Appl. Phys. Lett.* **83**, 2566-2568 (2003) - Conducted simulations.
41. J. Ihanus, M. Ritala, M. Leskelä, E. Soininen, W. Park, A. E. Kaloyeros, W. Harris, K. W. Barth, A. W. Topol, T. Sajavaara, and J. Keinonen, “Blue and green emitting SrS:Cu electroluminescent devices deposited by the atomic layer deposition technique”, *J. Appl. Phys.* **94**, 3862-3868 (2003) - Conducted photoluminescence spectroscopy and provided theoretical analysis.
42. W. Park and C. J. Summers, “Optical properties of superlattice photonic crystal waveguides”, *Appl. Phys. Lett.* **84**, 2013-2015 (2004) - Designed new nanostructure and conducted simulations.
43. W. Park and J.-B. Lee, “Mechanically tunable photonic crystal structures”, *Appl. Phys. Lett.*, **85**, 4845-4847 (2004): *featured on the cover page.* - Invented new device and conducted simulations.
44. E. Schonbrun, M. Tinker, W. Park and J.-B. Lee, “Negative Refraction in a Si-Polymer Photonic Crystal Membrane”, *IEEE Photon. Technol. Lett.* **17**, 1196-1198 (2005) - Designed new nanostructure, conducted simulations and optical characterizations.
45. Q. Wu and W. Park, “Broadband sub-wavelength imaging by mechanically tunable photonic crystal”, *J. Comput. Theor. Nanosci.* **2**, 202-206 (2005) - Designed new nanostructure and conducted simulations.
46. Q. Wu, E. Schonbrun and W. Park, “Tunable Superlensing by Mechanically Controlled Photonic Crystal”, *J. Opt. Soc. Am. B* **23**, 479-484 (2006) - Designed new nanostructure and conducted simulations.
47. M. Tinker, E. Schonbrun, J.-B. Lee, and W. Park, “Process integration and development of inverted photonic crystal arrays”, *J. Vac. Sci. Technol. B* **24**, 705-709 (2006) - Designed new nanostructure, conducted simulations and optical characterizations.
48. W. Park and J. Owens, “Future Directions in the Treatment of Oral Cancer”, *Otolaryngol. Clinics North Am.* **39**, 381-396 (2006) - provided a review on biomedical applications of photonic nanostructures.
49. E. Schonbrun, T. Yamashita, W. Park and C. J. Summers, “Negative Index Imaging by an Index-Matched Photonic Crystal Slab”, *Phys. Rev. B* **73**, 195117-1-6 (2006) - Designed new nanostructure, conducted simulations and optical characterizations.
50. Z. A. Sechrist, B. T. Schwartz, J. H. Lee, J. A. McCormick, R. Piestun, W. Park, and S. M. George, “Modification of Opal Photonic Crystals Using Al<sub>2</sub>O<sub>3</sub> Atomic Layer Deposition”, *Chem. Mater.* **18**, 3562-3570 (2006) - Made nanomaterials, conducted simulations and optical characterizations.

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<sup>‡</sup> After I moved to Colorado, I continued to work with my former advisor, Prof. Chris Summers of Georgia Tech and published many papers together. But for the most part I led the interaction and Prof. Summers’s contribution has mainly been providing access to the state-of-the-art nanofabrication facility not available in Colorado. In all publications with Prof. Summers after 35 (except 39, 40), I or my students played the leading role and the Georgia Tech group contributed with fabrications. For 39 & 40, Georgia Tech group played the leading role and I contributed with simulations and also co-advised the student author(s).

51. E. Schonbrun, Q. Wu, W. Park, T. Yamashita, and C. J. Summers, “Polarization Beam Splitter Based on a Photonic Crystal Heterostructure”, *Opt. Lett.* **31**, 3104-3106 (2006) - Designed new nanostructure, conducted simulations and optical characterizations.
52. J. H. Lee, Q. Wu and W. Park, “Fabrication and Optical Characterizations of Gold Nanoshell Opal”, *J. Mater. Res.* **21**, 3215-3221 (2006) - Made nanomaterials, conducted simulations and optical characterizations.
53. E. Schonbrun, Q. Wu, W. Park, M. Abashin, Y. Fainman, T. Yamashita and C. J. Summers, “Wavefront Evolution of Negatively Refracted Waves in Photonic Crystals”, *Appl. Phys. Lett.* **90**, 041113-1-3 (2007) - Designed new nanostructure, conducted simulations and optical characterizations.
54. H.-J. Kim, S. Kim, H. Jeon, J. Ma, S. H. Choi, S. Lee, C. Ko, and W. Park, “Fluorescence amplification using colloidal photonic crystal platform in sensing dye-labeled deoxyribonucleic acids”, *Sensors and Actuators B* **124**, 147-152 (2007) - Made nanomaterials, conducted optical characterizations.
55. E. Schonbrun, Q. Wu, W. Park, M. Abashin, Y. Fainman, J. Blair, and C. J. Summers, “Total Internal Reflection Photonic Crystal Prism”, *Opt. Express* **15**, 8065-8075 (2007) - Designed new nanostructure, conducted simulations and optical characterizations.
56. Q. Wu, E. Schonbrun, and W. Park, “Image Inversion and Magnification by Negative Index Prisms”, *J. Opt. Soc. Am. A* **24**, A45-A51 (2007) - Designed new nanostructure and conducted simulations.
57. E. Schonbrun, Q. Wu, W. Park, M. Abashin, Y. Fainman, T. Yamashita and C. J. Summers, “Imaging the Wavefront Curvature Reversal in Photonic Crystals”, *Optics and Photonics News*, pp. 34, Dec. 2007, Featured in *Optics in 2007*, the annual highlights in optics research selected by the Optical Society of America.
58. W. Park and Q. Wu, “Negative Effective Permeability in Metal Cluster Photonic Crystal”, *Solid State Commun.* **146**, 221 (2008) - Designed new nanostructure and conducted simulations.
59. Y. Cui, Q. Wu, E. Schonbrun, M. Tinker, J.-B. Lee, and W. Park, "Silicon-Based 2D Slab Nano Photonic Crystal TM Polarizer in Telecommunication Wavelength", *IEEE Photon. Technol. Lett.* **20**, 641 (2008) - Designed new nanostructure, conducted simulations and optical characterizations.
60. W. Park and Q. Wu, “Optical Frequency Magnetic Activity in Metal Nanocluster Photonic Crystal”, *J. Comput. Theor. Nanosci*, **5**, 476 (2008)
61. Q. Wu and W. Park, “Negative index materials based on metal nanoclusters”, *Appl. Phys. Lett.* **92**, 153114 (2008)
62. J. H. Lee and W. Park, “Three Dimensional Metallic Photonic Crystal Based on Self-Assembled Gold Nanoshells”, *Func. Mater. Lett.* **1**, 65 (2008)
63. Q. Wu, J. M. Gibbons and W. Park, “Graded negative index lens by photonic crystals”, *Opt. Express* **16**, 16941 (2008)
64. W. Park and J. Kim, “Negative Index Materials: Optics by Design”, *MRS Bulletin* **33**, 907 (2008)
65. M. A. Weimer, A. W. Weimer, and W. Park, “Theory of conduction in ultrafast metal-insulator varistors”, *J. Appl. Phys.* **104**, 114516 (2008)
66. J. H. Lee, Q. Wu, and W. Park, “Metal nanocluster metamaterial fabricated by the colloidal self-assembly”, *Opt. Lett.* **34**, 443-445 (2009).
67. W. Park and J.-B. Lee, “Mechanically Tunable Photonic Crystals”, *Optics and Photonics News*, Jan. 2009.

***Brief Information on the journals in which I published:***

Physics/Applied Physics:

*Applied Physics Letters* is a top journal in applied physics published by American Institute of Physics (AIP), publishes 3-page letters only, has one of the largest audience. Impact Factor (IF): 3.977.

*Journal of Applied Physics* is also a top journal in applied physics published by AIP, a sister journal of Applied Physics Letters, publishes full-length articles. IF: 2.316.

*Physical Review B* is a top journal in condensed matter physics, has the largest audience and citations among condensed matter physics journals. IF: 3.185.

*Solid State Communications* is a major international journal in condensed matter physics, publishing short communications. Index by Science Citation Index (SCI), Engineering Index (EI) and many others. IF: 1.556.

*Physica Status Solidi (b)* is a major international journal in condensed matter physics. Index by SCI and many others. IF: 0.967.

*Journal of Physics and Chemistry of Solids (J. Phys. Chem. Solids)* is a major international journal covering condensed matter and materials science. Indexed by EI and many others. IF: 1.164.

*Journal of the Computational and Theoretical Nanoscience (J. Comput. Theor. Nanosci.)* is a newly started journal covering computational and theoretical nanoscience. Indexed by SCI and many others.

#### Optics/Photonics:

*IEEE Photonics Technology Letters (IEEE Photon. Technol. Lett.)* is a top journal in photonics published by IEEE Lasers and Electro-Optics Society, has one of the largest citations. IF: 2.353.

*Optics Express (Opt. Express)* is a top journal in optics published by Optical Society of America (OSA), specializes in rapid publications, has one of the largest citations, has the highest impact factor among optics journals. IF: 4.009.

*Optics Letters (Opt. Lett.)* is another top journal in optics published by OSA, specializes in short letters, has the largest citations among optics journals and also a very high impact factor. IF: 3.598.

*Journal of the Optical Society of America A (J. Soc. Opt. Am. A)* is a top journal in optics published by OSA, publishes full-length articles on imaging and vision. IF: 2.002.

*Journal of the Optical Society of America B (J. Soc. Opt. Am. B)* is a top journal in optics published by OSA, publishes full-length articles on optical physics. IF: 2.002.

*Journal of Luminescence (J. Lumin.)* is a major international journal on luminescence and spectroscopy. Indexed by SCI, EI and many others. IF: 1.441.

*Journal of the Society for Information Display (J. SID)* is the flagship journal of the Society for Information Display, covers various aspects of display and imaging devices.

*Displays* is an international journal covering display devices and visual information systems. IF: 1.017.

*Journal of Nonlinear Optical Physics & Materials (J. Nonlinear Opt. Phys. Mater.)* is an international journal specializing in nonlinear interaction of light and matter. IF: 0.496.

#### Materials Science:

*Chemistry of Materials* is a top journal in solid-state chemistry including both organic and inorganic materials, published by the American Chemical Society. IF: 5.104.

*Journal of Materials Research* is a top journal in materials science, the flagship journal of the Materials Research Society. IF: 2.354.

*Journal of the Electrochemical Society* is the flagship journal of the Electrochemical Society, a top journal covering solid-state materials and electrochemistry. IF: 2.387.

*Journal of Crystal Growth* is a major international journal on crystalline materials and their mechanical, electronic and optical properties, has very high citations. IF: 1.809

*Journal of Electronic Materials* is a major journal published by the Minerals, Materials and Metals Society (TMS), covers electronic materials such as semiconductors, metals and insulators. IF: 1.504

*Journal of Vacuum Science & Technology B* is the flagship journal of the American Vacuum Society, a major journal covering microelectronic materials and nanostructures. IF: 1.597.

*Materials Science and Engineering B* is a major international journal on electronic, optical and magnetic materials. Indexed by SCI and many others. IF: 1.331

*Journal of Materials Science* is a major, comprehensive journal on materials science. Indexed by SCI, many others. IF: 0.999.

Devices:

*Sensors and Actuators B* is a major journal in the field of chemical sensors, actuators and microsystems. Indexing by SCI, EI and many others, IF: 2.331.

Biomedical Science:

*Otolaryngologic Clinics of North America* publishes comprehensive, state-of-the-art reviews that provide current, practical information on the diagnosis and treatment of conditions affecting the ears, nose, and throat. Each issue focuses on a single topic relevant to the ear-nose-throat practice.

### ***Peer-Reviewed Conference Proceeding***<sup>§</sup>

1. T. K. Tran, W. Park, J. W. Tomm, B. K. Wagner, S. M. Jacobsen, and C. J. Summers, "Photoluminescence Properties of ZnGa<sub>2</sub>O<sub>4</sub>:Mn Phosphor Powders", *Proceedings of SPIE*, Vol. 2554, p.253-264, 1995. - Conducted photoluminescence spectroscopy and provided key theoretical modeling and analysis.
2. W. Tong, X. Shen, B. K. Wagner, T. K. Tran, W. Ogle, W. Park, T. Yang, and C. J. Summers, "Metalorganic Molecular Beam Epitaxy of ZnS for Flat Panel Displays", *Proceedings of SPIE*, Vol. 2408, p.182-193, 1995. - Conducted photoluminescence spectroscopy.
3. W. Park, T. Yang, M. Chaichimansour, W. Tong, B. K. Wagner, and C. J. Summers, "Photoluminescence Properties of SrS:Ce Thin Films Grown by Molecular Beam Epitaxy", *Proceedings of the Third International Display Workshop*, p.49, 1996. - Conducted photoluminescence spectroscopy and provided theoretical analysis.
4. W. Park, T. K. Tran, W. Tong, M. M. Kyi, S. Schön, B. K. Wagner, and C. J. Summers, "Photoluminescence Properties of  $\delta$ -doped ZnS:Mn Grown by Metal-Organic Molecular Beam Epitaxy", *Proceedings of Materials Research Society Symposium*, vol. 424, p.465-470, 1996. - Conducted photoluminescence spectroscopy and provided theoretical analysis.
5. W. Park, T. C. Jones, W. Tong, B. K. Wagner, and C. J. Summers, "Photoluminescence Properties of SrS:Ce,Ag Thin Film Phosphors", *Proceedings of the Fourth International Display Workshop*, p.645, 1997. - Conducted photoluminescence spectroscopy and provided theoretical analysis.
6. W. Park, T. C. Jones, E. Mohamed, C. J. Summers, and S.-S. Sun, "Optical Properties of SrS:X (X=Cu, Ag) Thin Film Phosphors", *Proceedings of the Fifth International Display Workshop*, p.613, 1998. - Conducted photoluminescence spectroscopy and provided theoretical analysis.
7. T. C. Jones, W. Park, E. Mohamed, B. K. Wagner, C. J. Summers, and S.-S. Sun, "Luminescence Properties of Thin-Film SrS:Cu Phosphors for Electroluminescent Displays", *Proceedings of Materials Research Society Symposium*, vol. 508, p.281-287, 1998. - Conducted photoluminescence spectroscopy and provided theoretical analysis.
8. W. Park, T. C. Jones, B. K. Wagner, and C. J. Summers, "Multi-Layer Stacked Electroluminescent Devices", *SID International Symposium Digest*, vol. 30, p.592-595, 1999. - Invented new device concept and conducted device modeling.
9. W. Park, T. C. Jones, C. J. Summers and S.-S. Sun, "Luminescence Properties of SrS:Cu,Eu Two-Component Electroluminescent Phosphors", *Proceedings of the 10th International Workshop on Inorganic and Organic Electroluminescence*, p.451, 2000. - Conducted photoluminescence spectroscopy and provided theoretical analysis.
10. (Invited paper) B. K. Wagner, F. Zhang, P. Manigault, W. Park, C. J. Summers, P. N. Yocom and D. Zarimba, "Recent Developments in Low Voltage Cathodoluminescent Phosphors", *Proceedings of*

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<sup>§</sup> My contribution is briefly described for each article. Authors for whom I was the principal advisor are underlined. Article 13 and later are published after I moved to the University of Colorado.

- the Seventh International Display Workshop*, p. 833-836, 2000. - Made materials, conducted cathodoluminescence measurements.
11. W. Tong, Y. B. Xin, B. K. Wagner, W. Park and C. J. Summers, "Recent Development of SrS Based EL Materials", *Proceedings of the 10th International Workshop on Inorganic and Organic Electroluminescence*, p.433, 2000. - Conducted photoluminescence spectroscopy.
  12. J. Ihanus, M. Ritala, M. Leskelä, E. Soininen, M. Lahonen, A. Kaloyeros, W. Harris, K. Barth, A. Topol, W. Park, T. Sajavaara and J. Keinonen, "Pulsing of H<sub>2</sub> during the ALE growth of SrS:Cu", *Proceedings of the 10th International Workshop on Inorganic and Organic Electroluminescence*, p.443, 2000. - Conducted photoluminescence spectroscopy and provided theoretical analysis.
  13. C. Neff, W. Park and C. J. Summers, "Dynamic photonic crystal superlattices", *Proceedings of IEEE Lasers and Electro-Optics Society Annual Meeting*, vol. 1, p.190-191, 2002. - Designed new nanostructure and conducted simulations.
  14. W. Park and T. Borsa, "Synthesis and Self-Assembly of Metal-Coated Dielectric Spheres for 3D Photonic Crystal Structures", *Proceedings of Materials Research Society Symposium*, vol. 820, p. 289-294, 2004. - Made nanomaterials, conducted simulations and optical characterizations.
  15. W. Park, E. Schonbrun, M. Tinker and J.-B. Lee, "Tunable nanophotonic device based on flexible photonic crystal", *Proceedings of SPIE*, vol. 5511, p. 165-172, 2004. - Designed new nanostructure, conducted simulations and optical characterizations.
  16. (Invited paper) C. J. Summers, C. Neff, B. K. Wagner and W. Park, "Tunable Photonic Crystal Structures", *Proceedings of SPIE*, vol. 5511, p. 81-92, 2004. - Designed new nanostructure and conducted simulations.
  17. W. Park, E. Schonbrun, M. Tinker and J.-B. Lee, "Mechanically Tunable Nanophotonic Devices", *Proceedings of Materials Research Society Symposium*, vol. 873, p. 123-128, 2005. - Designed new nanostructure and conducted simulations and optical characterizations.
  18. E. Schonbrun, Q. Wu, W. Park, M. Tinker and J.-B. Lee, "Negative Refraction and Imaging in a Flexible Photonic Crystal", *Proceedings of SPIE*, vol. 5926, p. 140-145, 2005. - Designed new nanostructure and conducted simulations and optical characterizations.
  19. Y. Cui, Q. Wu, E. Schonbrun, M. Tinker, J.-B. Lee, and W. Park, "Silicon-Based 2D Slab Nano Photonic Crystal TM Polarizer in Telecommunication Wavelength", *The 7<sup>th</sup> IEEE International Conference on Nanotechnology*, Hong Kong, Aug. 2-5, 2007, Accepted. - Designed new nanostructure and conducted simulations and optical characterizations.

#### **Other Conference Presentations \*\***

1. W. Park, T. K. Tran, W. Tong, B. K. Wagner, and C. J. Summers, "High-quality ZnS thin film growth for flat panel display", *The First International Conference on the Science and Technology of Display Phosphors*, San Diego, CA, Nov. 14-16, 1995.
2. T. Yang, M. Chaichimansour, W. Park, B. K. Wagner and C. J. Summers, "MBE growth and characterization of SrGa<sub>2</sub>S<sub>4</sub>:Ce blue phosphor for thin-film electroluminescence", *The First International Conference on the Science and Technology of Display Phosphors*, San Diego, CA, Nov. 14-16, 1995.
3. W. Park, T. C. Jones, W. Tong, B. K. Wagner, C. J. Summers, and S.-S. Sun, "Luminescent Properties of a New Blue EL Phosphor, SrS:Cu", *The Third International Conference on the Science and Technology of Display Phosphors*, Huntington Beach, CA, Nov. 3-5, 1997.

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\*\* Authors for whom I was the principal advisor are underlined.  
Presentation 14 and later are made after I moved to the University of Colorado.

4. W. Park, T. Jones, S. Schön, W. Tong, B. K. Wagner, and C. J. Summers, "Luminescent Properties of Mn Ions in Homogeneously- and Delta-Doped ZnS:Mn", *American Physical Society March Meeting*, Kansas City, MO, Mar. 17-21, 1997.
5. W. Park, T. C. Jones, E. Mohammed, C. J. Summers, and S.-S. Sun, "Luminescence Properties of SrS:Cu,Ag Thin Film electroluminescent Phosphors", *The Ninth International Workshop on Inorganic and Organic Electroluminescence and the Fourth International Conference on the Science and Technology of Display Phosphors*, Bend, OR, Sep. 14-17, 1998.
6. H. M. Menkara, W. Park, M. Chaichimansour, T. C. Jones, E. Mohamed, B. K. Wagner, and C. J. Summers, "Evaporation and Characterization of SrS:Cu,Ag EL Devices", *The Ninth International Workshop on Inorganic and Organic Electroluminescence and the Fourth International Conference on the Science and Technology of Display Phosphors*, Bend, OR, Sep. 14-17, 1998.
7. W. Tong, Y. Xin, M. Chaichimansour, J. Choi, T. C. Jones, W. Park, B. K. Wagner, and C. J. Summers, "MBE Growth of SrS:Cu", *The Ninth International Workshop on Inorganic and Organic Electroluminescence and the Fourth International Conference on the Science and Technology of Display Phosphors*, Bend, OR, Sep. 14-17, 1998.
8. W. Park, B. K. Wagner, G. Russell, K. Yasuda, C. J. Summers, Y. R. Do and H. G. Yang, "Enhanced Low Voltage Cathodoluminescence Performance of ZnS Phosphors Coated with SiO<sub>2</sub>", *The Fifth International Conference on the Science and Technology of Display Phosphors*, San Diego, CA, Nov. 8-10, 1999.
9. W. Tong, Y. Xin, E. Mohammed, W. Park and C. J. Summers, "Physical Vapor Deposition of SrS:Pb and CaS:Cu Blue TFEL Phosphors", *The Fifth International Conference on the Science and Technology of Display Phosphors*, San Diego, CA, Nov. 8-10, 1999.
10. Y. B. Xin, W. Tong, M. Chaichimansour, W. Park and C. J. Summers, "Microstructure Analysis of MBE-Grown SrS-Based Phosphors", *The Fifth International Conference on the Science and Technology of Display Phosphors*, San Diego, CA, Nov. 8-10, 1999.
11. W. Park, C. J. Summers, Y. R. Do and H. G. Yang, "Photoluminescence Properties of Red BaGdB<sub>9</sub>O<sub>16</sub>:Eu Phosphor", *The Sixth International Conference on the Science and Technology of Display Phosphors*, San Diego, CA, Nov. 6-8, 2000.
12. W. Park, E. Mohamed, W. Tong, S. R. Stock and C. J. Summers, "Luminescence Properties of Sr<sub>x</sub>Ca<sub>1-x</sub>S:Cu Thin Film Phosphors", *The Sixth International Conference on the Science and Technology of Display Phosphors*, San Diego, CA, Nov. 6-8, 2000.
13. W. Park and C. J. Summers, "ZnS-Based Two-Dimensional Photonic Crystals", *The First Georgia Tech Conference on Nanoscience and Nanotechnology*, Atlanta, GA, Oct. 16-18, 2000.
14. (Invited) W. Park, J. S. King, C. W. Neff, C. Liddell and C. J. Summers, "ZnS-Based Photonic Crystals", *The 10th International Conference on II-VI Compounds*, Bremen, Germany, Sep. 9-14, 2001.
15. W. Park, C. W. Neff and C. J. Summers, "Tunable 2D Photonic Crystal Slabs Exhibiting Extraordinary Refraction and Dispersion", *The Fourth International Workshop on Photonic and Electromagnetic Crystal Structures*, Los Angeles, CA, Oct. 28-31, 2002.
16. (Invited) C. J. Summers and W. Park, "Novel photonic architectures: liquid crystal infiltrated photonic crystals", *SPIE International Symposium on Optical Science and Technology*, San Diego, CA, Aug. 3-8, 2003.
17. W. Park, E. Schonbrun, M. Tinker and J.-B. Lee, "Flexible Photonic Crystal – A New Pathway to Tunability", *The Fifth International Symposium on Photonic and Electromagnetic Crystal Structures*, Kyoto, Japan, Mar. 7-11, 2004.
18. (Invited) W. Park, "Mechanically Tunable Photonic Crystals", *The 7th Mediterranean Workshop and Topical Meeting on Novel Optical Materials and Applications*, Cetraro, Italy, May 29 - June 4, 2005.

19. W. Park, E. Schonbrun, Q. Wu, M. Tinker and J.-B. Lee, “Tunable Negative Refraction in Si-Polymer Photonic Crystal Membrane”, *The Sixth International Symposium on Photonic and Electromagnetic Crystal Structures*, Crete, Greece, Jun. 19-24, 2005.
20. Q. Wu, E. Schonbrun, W. Park M. Tinker and J.-B. Lee, “Tunable Two-Dimensional Photonic Crystal Slab Exhibiting Broadband Sub-Wavelength Resolution”, *The 4th Symposium on Photonics, Networking and Computing in Conjunction with the 8th Joint Conference on Information Science*, Salt Lake City, UT, Jul. 21-23, 2005.
21. W. Park, “Photonic Nanostructures for Negative Index Materials”, *The First Nanoscience and Applications Conference*, Boulder, CO, Oct. 17-19, 2005.
22. W. Park, K. R. Shroyer, and A. Meyers, “Novel Nanoprobes for Cancer Imaging and Treatment”, *CU-NIST Fall Symposium*, Nov. 14, 2005.
23. J.-H. Lee, Q. Wu and W. Park, “Three Dimensional Metallodielectric Photonic Crystal Based on Self-Assembled Gold Nanoshells”, *Materials Research Society Symposium*, Boston, MA, Nov. 28-Dec. 2, 2005.
24. (Invited) W. Park, “Photonic Crystal Approach for Negative Index Materials”, *The 36th Winter Colloquium on the Physics of Quantum Electronics*, Snowbird, UT, Jan. 2-6, 2006.
25. W. Park, E. Schonbrun, Q. Wu, T. Yamashita, C. J. Summers, Y. Cui, M. Tinker and J.-B. Lee, “Negative Index Imaging by Si-Based 2D Photonic Crystal Structures”, *Materials Research Society Symposium*, San Francisco, CA, Apr. 17- 21, 2006.
26. E. Schonbrun, Q. Wu, W. Park, T. Yamashita and C. J. Summers, “Matched Negative Index Imaging in the Near-Infrared with Silicon Photonic Crystals”, *2006 Conference on Lasers and Electro-Optics/Quantum Electronics and Laser Science Conference*, Los Angeles, CA, May 21-26, 2006.
27. W. Park, E. Schonbrun, Q. Wu, Y. Yamashita, C. J. Summers, M. Tinker, Y. Cui, and J.-B. Lee, “Negative Refraction in Si-based 2-dimensional Slab Photonic Crystal Structures”, *OSA Topical Meeting on Photonic Metamaterials: From Random to Periodic*, Grand Island, The Bahamas, Jun. 5- 8, 2006.
28. Z. A. Sechrist, B. T. Schwartz, J. H. Lee, F. H. Fabreguette, J. A. McCormick, W. Park, R. Piestun, and S. M. George, “Selective Modification of Opal Photonic Crystals Using Atomic Layer Deposition”, *The Optical Society of America Topical Meeting on Photonic Metamaterials: From Random to Periodic*, Grand Island, The Bahamas, Jun. 5-8, 2006.
29. (Invited) W. Park, “Negative Refraction in 2D Si-Based Photonic Crystal Structures”, *Frontiers in Optics 2006: The 90th Optical Society of America Annual Meeting*, Rochester, NY, Oct. 8-12, 2006.
30. (Invited) W. Park, “Si-Based 2D Photonic Crystal Structures”, *International Symposium on Biophotonics, Nanophotonics and Metamaterials*, Hangzhou, China, Oct. 16-18, 2006.
31. (Invited) W. Park, “Negative Refraction and Self-Collimation in Si-Based 2D Photonic Crystal Structures”, *Binational Consortium of Optics School: Optics of Novel Materials and of Condensed Matter*, Tucson, AZ, Nov. 17-20, 2006.
32. (Invited) W. Park, “On-Chip Spectroscopy System for Cancer Detection”, *US-Ireland R&D Partnership Workshop*, Dublin, Ireland, February, 20-21, 2007.
33. W. Park, E. Schonbrun, M. Abashin, Y. Fainman, T. Yamashita and C. J. Summers, “Self-Collimation in Si 2D Photonic Crystal Structures”, *The Seventh International Workshop on Photonic and Electromagnetic Crystal Structures*, Monterey, CA, Apr. 8-11, 2007.
34. J. Lee and W. Park, “3D Metallodielectric Photonic Crystal Based on Gold Nanoshells”, *Materials Research Society Symposium*, San Francisco, CA, Apr. 9- 13, 2007.
35. E. Schonbrun, Q. Wu, W. Park, T. Yamashita, J. Blair, and C. J. Summers, “Photonic Crystal Reflection Prisms”, *2007 Conference on Lasers and Electro-Optics/Quantum Electronics and Laser Science Conference*, Baltimore, MD, May 6-11, 2007.
36. Q. Wu, E. Schonbrun and W. Park, “Image Inversion and Magnification by Negative Index Prisms”, *2007 Conference on Lasers and Electro-Optics/Quantum Electronics and Laser Science Conference*, Baltimore, MD, May 6-11, 2007.

37. (Invited) W. Park, "Anomalous Refraction in Silicon-Based 2-Dimensional Photonic Crystal Structures", *OSA Topical Meeting on Photonic Metamaterials: From Random to Periodic*, Jackson Hole, WY, Jun. 4-7, 2007.
38. Q. Wu and W. Park, "Silver Nanowire Cluster Photonic Crystal Exhibits Negative Permeability", *OSA Topical Meeting on Photonic Metamaterials: From Random to Periodic*, Jackson Hole, WY, Jun. 4-7, 2007.
39. W. Park and Q. Wu, "Optical Frequency Magnetic Activity in Metal Nanocluster Photonic Crystal – A New Metamaterial Architecture", *OSA Topical Conference on Nanophotonics*, Hangzhou, China, Jun. 18-21, 2007.
40. (Invited) W. Park, "Negative Refraction in 2-Dimensional Silicon Photonic Crystals", *5th Symposium on Photonics, Networking and Computing in Conjunction with the 10th Joint Conference on Information Science*, Salt Lake City, UT, Jul. 18-19, 2007.
41. Q. Wu, J.-H. Lee, J. Ahn and W. Park, "Metal Nanocluster Metamaterial", *2008 Conference on Lasers and Electro-Optics/Quantum Electronics and Laser Science Conference*, San Jose, CA, May 4-9, 2008.
42. J. Ahn, W. Park, L. Bemis and W. A. Robinson, "Recognition of double-stranded DNA by gold nanoprobe for malignant melanoma detection", *2008 Conference on Lasers and Electro-Optics/Quantum Electronics and Laser Science Conference*, San Jose, CA, May 4-9, 2008.
43. J.-H. Lee, J. Xue, Q. Wu, W. Park and A. Mickelson, "Active Polymer-Based Surface Plasmon-Polariton Waveguides", *10th International Conference on Organic Nonlinear Optics*, Santa Fe, NM, May 18-23, 2008.
44. J.-H. Lee, Q. Wu, J. Xue, W. Park and A. Mickelson, "Active Plasmonics", *2008 IEEE AP-S & USNC/URSI Symposium*, San Diego, CA, Jul. 5-12, 2008.
45. J.-H. Lee and W. Park, "Three-Dimensional Metal Dielectric Photonic Crystal Based on Self-Assembled Gold Nanoshells", *SPIE Optics + Photonics*, San Diego, CA, Aug. 10-14, 2008.
46. W. Park, J.-H. Lee, J. Xue, Q. Wu and A. Mickelson, "Polymer-Based Active Plasmonic Devices", *236<sup>th</sup> American Chemical Society National Meeting & Exposition*, Philadelphia, PA, August 17-21, 2008.
47. J.-H. Lee, Q. Wu and W. Park, "Magnetic Resonance in Near Infrared Region of Gold Nanoparticle Cluster Metamaterial", *OSA Topical Meeting on Plasmonics and Metamaterials Optics*, Rochester, NY, Oct. 20-23, 2008.

***Brief Information on the conferences in which I presented:***

Large Society-Wide Conferences:

*Materials Research Society Symposium*

*American Physical Society March Meeting*

*Society for Information Display International Symposium*

*SPIE International Symposium on Optical Science and Technology*

*Conference on Lasers and Electro-Optics/Quantum Electronics and Laser Science Conference*

*Frontiers in Optics: The Optical Society of America Annual Meeting*

Topical Conferences:

*The International Conference on the Science and Technology of Display Phosphors*

*International Workshop on Photonic and Electromagnetic Crystal Structures*

*The International Workshop on Inorganic and Organic Electroluminescence*

*The International Conference on II-VI Compounds*

*Topical Meeting on Novel Optical Materials and Applications (invitation only)*

*Symposium on Photonics, Networking and Computing (invitation only)*

*The Winter Colloquium on the Physics of Quantum Electronics (invitation only)*

*OSA Topical Meeting on Photonic Metamaterials: From Random to Periodic*

**PATENTS**

1. W. Park, J.-B. Lee, E. Schonbrun and M. Tinker, "Strain Tunable, Flexible Photonic Crystals", United States Patent 7,283,716 (Oct. 16, 2007).
2. C. J. Summers and W. Park, "Photonic Crystals", United States Patent 6,999,669 (Feb. 14, 2006).
3. W. Park, K. Yasuda, B. K. Wagner and C. J. Summers, "Rare Earth Oxide Coated Phosphors and a Process for Preparing The Same", United States Patent 6,699,523 (Mar. 2, 2004).
4. W. Park and C. J. Summers, "Oxide-Based Quantum Cutter Method and Phosphor System", United States Patent 6,669,867 (Dec. 30, 2003).
5. W. Park and J.-B. Lee, "On-Chip Spectroscopy System for Chemical and Biological Detection", Invention Disclosure Filed.

**COURSES TAUGHT**

1. ECEN 5626 Active Optical Devices (new course)  
Complete set of class notes, homework solutions, exam solutions were prepared and made available through the class website ([http://ece.colorado.edu/~wpark/class/Active\\_Opt\\_Dev/](http://ece.colorado.edu/~wpark/class/Active_Opt_Dev/)).
2. ECEN 5015 Crystal Structures & Device Applications (new course)  
Complete set of class notes, homework solutions, exam solutions were prepared and made available through the class website (<http://ece.colorado.edu/~wpark/class/Crystal/>).
3. ECEN 5005 Crystals, Nanocrystals & Device Applications (new course)  
Complete set of class notes, homework solutions, exam solutions were prepared and made available through the class website (<http://ece.colorado.edu/~wpark/class/Crystal/>).
4. ECEN 5355 Principles of Electronic Devices I  
Complete set of class notes, homework solutions, exam solutions were prepared and made available through the class website (<http://ece.colorado.edu/~wpark/class/ecen5355/>).
5. ECEN 5385 Optical Properties of Materials  
Complete set of class notes, homework solutions, exam solutions were prepared and made available through the class website ([http://ece.colorado.edu/~wpark/class/Opt\\_Prop/](http://ece.colorado.edu/~wpark/class/Opt_Prop/)).
6. ECEN 4345 Introduction to Solid State  
Complete set of class notes, homework solutions, exam solutions were prepared and made available through the class website ([http://ece.colorado.edu/~wpark/class/Intro\\_SS/](http://ece.colorado.edu/~wpark/class/Intro_SS/)).
7. ECEN 3320 Semiconductor Devices  
Complete set of class notes, homework solutions, exam solutions were prepared and made available through the class website ([http://ece.colorado.edu/~wpark/class/Semicon\\_Dev/](http://ece.colorado.edu/~wpark/class/Semicon_Dev/)).
8. ECEN 3250 Circuits/Electronics 3  
Complete set of class notes, homework solutions, exam solutions were prepared and made available through the class website (<http://ece.colorado.edu/~wpark/class/ecen3250/>).

**INDIVIDUAL STUDENTS MENTORED - UNDERGRADUATE**

1. Benjamin Wolpoff, ECE undergraduate, independent study in Summer 2003.
2. Julie Lam, ECE undergraduate, independent study in Spring 2006.
3. Alex Silva, ECE undergraduate, independent study in Spring 2006.
4. Nancy Kim, MCDB undergraduate, summer research project through the Butcher Genomics-Biotechnology Supplementary Award, Summer 2006.
5. Michael Duckwitz, ECE undergraduate, independent study in Spring 2007.
6. Kai Gellat, ECE undergraduate, undergraduate research assistant in Spring 2007.

7. Amy L. Han, Biochemistry undergraduate, summer research project through the University of Colorado Cancer Center Student Fellowship Program, Summer 2007. Continuing as Undergraduate Research Assistant in Fall 2007.
8. John Gibbons, Engineering Physics undergraduate, Discovery Apprenticeship in AY 07-08. Received Electrical and Engineering Physics Award.
9. Mark Colbenson, Chemical Engineering undergraduate, Discovery Apprenticeship in Fall 07.

#### **INDIVIDUAL STUDENTS MENTORED - GRADUATE**

1. Tomoko Borsa, M.S. received in May 2003.
2. Ethan Schonbrun, Ph.D. received in May 2007.
3. Qi Wu, Ph.D. candidate in ECE (Aug. 2003 – Present)
4. Jin-Hyoung Lee, Ph.D. candidate in ECE (Jan. 2004 – Present)
5. Jihye Ahn, Ph.D. candidate in ECE (Oct. 2005 – Present)
6. Joseph Eaton, Ph.D. candidate in ECE (Aug. 2006 – Present)
7. Michael Weimer, M.S. candidate in ECE (Jan. 2007 – Present)
8. Arvinder Chadha, M.S. candidate in ECE, (Jan. 2007 – Present)
9. Max Colice, Ph.D. candidate in ECE, OSEP<sup>††</sup> lab rotation in Fall 2001.
10. Kaumudi Nivarthi, M.S. candidate in ECE, independent study in Fall 2004.
11. David Goldstein, Ph.D. candidate in Chemistry, OSEP lab rotation in Fall 2004.
12. Hee Jin Kim, Ph.D. candidate from Seoul National University (Seoul, Korea), visiting student in Fall 2004.
13. Seyitriza Tigrek, Ph.D. candidate in ECE, independent study in Fall 2005.
14. Jihye Ahn, M.S. candidate in ECE, independent study in Summer 2006.
15. Shirin Haji, M.S. candidate in ECE, independent study in Summer 2006.
16. Kasia Kobeszko, Ph.D. candidate in Chemistry, OSEP lab rotation in Spring 2007.

#### **CONFERENCE & PROFESSIONAL SOCIETY ACTIVITIES**

1. Editorial Board, *Journal of Computational and Theoretical Nanoscience* (2004 - Present)
2. Guest Editor, Special Issue on Negative Index Materials, *MRS Bulletin*, theme proposal approved and scheduled for publication in Oct. 2008.
3. International Program and Technical Committee for the *OSA Topical Conference on Nanophotonics*, Nanjing, China, May 26-29, 2008.
4. Program Committee for Fundamental Physics of Periodic and Random Media Session, *2007 Conference on Lasers and Electro-Optics/Quantum Electronics and Laser Science Conference (CLEO/QELS)*, Baltimore, MD, May 7-11, 2007.
5. Program Committee for Photonics Track, *The 8th Joint Conference on Information Sciences*, Salt Lake City, UT, July 21-26, 2005.
6. Member of American Physical Society, Materials Research Society, and Optical Society of America.

#### **CONSULTING ACTIVITIES**

1. PhosphorTech Corp., Atlanta, GA (2008 - 2009)
2. Georgia Institute of Technology, Atlanta, GA (2001 - 2003)
3. Daejoo Electronic Materials Co., Ltd., Shiheung, Korea (2000 - 2002)
4. NEC USA, Inc., C & C Research Laboratories, Princeton, NJ (2000)

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<sup>††</sup> NSF-funded Integrative Graduate Education, Research and Training (IGERT) program on Optical Science and Engineering.

### ***OTHER SERVICE ACTIVITIES***

1. Member, Graduate Studies Committee in ECE department (2003 - Present)
2. Chair, Faculty Search Committee in ECE, 2007-2008.
3. Member, Optics Faculty Search Committee (Chair: Dana Anderson), 2007-2008
4. Reviewed manuscripts for *Physical Review B*, *Applied Physics Letters*, *Optics Letters*, *IEEE Photonics Technology Letters*, *Journal of Optical Society of America B*, *Optics Express*, *Optical Materials*, *Materials Research Bulletin*, *Journal of the Society for Information Display*, *Journal of the Electrochemical Society Letters*, *Journal of Solid State Chemistry* and *Materials Research Society Symposium Proceeding*.
5. Reviewed research proposals for the National Science Foundation, U.S. Civilian Research & Development Foundation, The Implementation Group and Maryland Technology Development Corporation.

### ***OUTREACH***

1. Nanotechnology @ Mamie Doud Eisenhower Public Library, An Outreach Program for Children with ages between 9 and 14 and their parents, Mamie Doud Eisenhower Public Library (Broomfield, CO), Sep. 13, 2008.
2. Nanotechnology: It's in YOUR future!, An Outreach Program for Children with ages between 9 and 14 and their parents, Mamie Doud Eisenhower Public Library (Broomfield, CO), Aug. 11, 2007.  
Press coverage:
  - Hoping for big impact from small technology, Broomfield Enterprise, Aug. 10, 2007.
  - Program demonstrates the promise of nanotechnology, Daily Camera, Aug. 11, 2007.