

## Hao Zeng

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### EDUCATION

Ph.D., Physics (2001), thesis “Magnetism of Self-Ordered and Composite Nanostructures”

University of Nebraska-Lincoln, Lincoln, NE, advisor: David J. Sellmyer

M.S., Physics (1998),

University of Nebraska-Lincoln, Lincoln, NE

Graduate student (1993-1996)

Nanjing University, Nanjing, China, advisor: Youwei Du

B.S., Physics (1993), thesis “Non-Linear Optical Properties of Fullerene”

Nanjing University, Nanjing, China

### EXPERIENCE

#### Professor (Aug. 2014-present)

Department of Physics, University at Buffalo, the State University of New York

- Nanoscale magnetic materials and magnetism
- Spin properties of low dimensional semiconductors
- Novel energy harvesting materials
- Magnetic materials for bio-applications

#### Associate Professor (Aug. 2009-Aug. 2014)

Department of Physics, University at Buffalo, the State University of New York

- Nanoscale magnetic materials and magnetism
- Colloidal diluted magnetic semiconductor quantum dots, carrier dopant exchange interactions
- Materials and devices for solar energy harvesting
- Magnetic nanoparticles for biological applications

#### Assistant Professor (Aug. 2004-Aug. 2009)

Department of Physics, University at Buffalo, the State University of New York

- Synthesis of nanoscale magnetic, semiconductor and hybrid materials
- Nanoscale Magnetism
- Spin dependent charge transport in nanostructures

#### Postdoctoral Research Associate (Sept. 2001-Aug. 2004)

Group of Nanoscale Materials and Devices, IBM T.J. Watson Research Center, supervisor:

Shouheng Sun (IBM, now at Brown University) and Shan X. Wang (Stanford University, 2003-2004)

- Developed nanoparticle based bio-labels for ultra-sensitive DNA sensor
- Fabricated half-metallic nanoparticle junction array devices, investigated spin dependent charge transport properties
- Developed two-phase exchange-spring permanent magnets using nanoparticle self-assembly, achieved 50% energy product enhancement as compared to corresponding single-phase material

#### Research Assistant (Aug. 1996 –Aug. 2001)

Center for Materials Research and Analysis, University of Nebraska-Lincoln

- Developed non-epitaxial, textured FePt/CoPt thin films and nanocomposite films, with potential applications in extremely high density magnetic recording
- Produced magnetic nanowire arrays in self-ordered templates, studied structural and magnetic properties including magnetization reversal and magnetic interactions

#### **Research Assistant (Aug. 1993 – May 1996)**

Department of Physics, Nanjing University, Nanjing, China

- Synthesized and investigated optical properties of fullerene molecules ( $C_{60}$  and  $C_{70}$ )

#### **Visiting positions**

- Distinguished visiting professor and overseas member of International Center for Quantum Design, University of Science and Technology of China, 2010-present
- Distinguished visiting professor, Institute of Metal Research, the Chinese Academy of Sciences and Shenyang National Laboratory for Materials Science, 2011-present
- Tengfei visiting professor, Xi'an Jiaotong University, 2014-present
- Visiting professor, Shanxi Normal University, 2011-2015
- Visiting professor, Zhejiang University, 2010-2012

#### **AWARDS**

- 2011 Lee Hsun Young Scientist Lecture Series on Materials Science, Institute of Metal Research, the Chinese Academy of Sciences
- 2009 UB's Exceptional Scholar-Young Investigator Award
- 2006 National Science Foundation CAREER Award
- 2003 IBM Research Division Award
- 2003 BCC Leadership in Nanomaterials Award (group award)
- 1998-2001 IBM Cooperative Graduate Student Fellowship
- 1997-1998 Wheeler University Fellowship, UNL

#### **PROFESSIONAL SOCIETIES**

- Member of the American Physical Society
- Member of the American Association for the Advancement of Science
- Member of the Materials Research Society
- Member of the Institute of Electrical & Electronics Engineers

#### **PUBLICATIONS**

##### **JOURNAL PAPERS**

##### **• CITATIONS**

As of 12/2017: **11,000+** citations; *h*-index: **37** (from Web of Science).

Google Scholar profile: <https://scholar.google.com/citations?user=BT95LeMAAAAJ&hl=en>

1. M. Zhao, L. Zhang, M. Liu, Y. Dong, C. Zou, Y. Hu, K. Yang, Y. Yang, H. Zeng, and S. Huang, "Growth of atomically thin  $MoS_2$  flakes on high-kappa substrates by chemical vapor deposition", *J. Mater. Sci.* 53, 4262-4273 (2018).

2. C. Zhao, T. Norden, P. Zhang, P. Zhao, Y. Cheng, F. Sun, J. P. Parry, P. Taheri, J. Wang, Y. Yang, T. Scrace, K. Kang, S. Yang, G.-X Miao, R. Sabirianov, G. Kioseoglou, W. Huang, A. Petrou, and H. Zeng, "Enhanced valley splitting in monolayer WSe<sub>2</sub> due to magnetic exchange field", *Nature Nano.*, 12, 757 (2017).
3. Y. Yang, C. Chen, M. C. Scott, C. Ophus, R. Xu, A. Pryor, L. Wu, F. Sun, W. Theis, J. Zhou, M. Eisenbach, P. R. C. Kent, R. F. Sabirianov, H. Zeng, P. Ercius & J. Miao, "Deciphering chemical order/disorder and material properties at the single-atom level", *Nature*, 542, 75–79 (2017).
4. N. Gross, Y. Sun, S. Perera, H. Hui, X. Wei, S. Zhang, H. Zeng and B. A. Weinstein, "Stability and band gap tuning of the chalcogenide perovskite BaZrS<sub>3</sub> in Raman and optical investigations at high pressure", *Phys. Rev. Appl.*, 8, 044014 (2017).
5. F. Wang, M. Li, L. Yu, F. Sun, Z. Wang, L. Zhang, H. Zeng, and X. Xu, "Corn-like, recoverable  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub>@SiO<sub>2</sub>@TiO<sub>2</sub> photocatalyst induced by magnetic dipole interactions", *Sci. Rep.*, 7, 6960 (2017).
6. X. Xu, J. Chen, G. Gehring, X. Miao and H. Zeng, "Spin Transport and Magnetism in Low-Dimensional Materials", *Adv. Cond. Matt. Phys.* (2017).
7. S. Perera, H. Hui, C. Zhao, H. Xue, F. Sun, C. Deng, N. Gross, C. Milleville, X. Xu, D.F. Watson, B. Weinstein, Y. Sun, S. Zhang, H. Zeng, "Chalcogenide perovskites—an emerging class of ionic semiconductors", *Nano Energy* 22, 129-135 (2016).
8. L. Shi; J.H. Yang, H.B. Zeng, Y.M. Chen, S.C. Yang, C. Wu, H. Zeng, O. Yoshihito, Q. Zhang, "Carbon dots with high fluorescence quantum yield: the fluorescence originates from organic fluorophores", *Nanoscale*, 8,14374-14378 (2016).
9. J. Wang, F. Sun, S. Yang, Y. Li, C. Zhao, M. Xu, Y. Zhang and H. Zeng, "Robust ferromagnetism in Mn-doped MoS<sub>2</sub> nanostructures", *Appl. Phys. Lett.* 109, 092401 (2016).
10. P. Taheri, J. Wang, H. Xing, J. F Destino, M. M. Arik, C. Zhao, K. Kang, B. Blizzard, L. Zhang, P. Zhao, S. Huang, S. Yang, F. V. Bright, J. Cerne and H. Zeng, "Growth mechanism of largescale MoS<sub>2</sub> monolayer by sulfurization of MoO<sub>3</sub> film", *Mater. Res. Express*, 3, (2016).
11. J. Tong, H. Zeng, Z.A. Xu and C.L. Yang, "Metal precursor with bi-layer indium for Cu(In,Ga)Se<sub>2</sub> thin film preparation", *Sol. Energy Mater. Sol. Cells*, 150, 88-94 (2016).
12. H. Kamati, X. Wang, J. Parry, Y. Qin and H. Zeng, "Synthesis and Characterization of Copper-Iron Nitride Thin Films", *MRS Adv.* 1, 203-208 (2016).
13. R.C. Rai, J. Hinz, G.X.A. Petronilo, F. Sun, H. Zeng, M.L. Nakarmi, and P.R. Niraula, "Signature of structural distortion in optical spectra of YFe<sub>2</sub>O<sub>4</sub> thin film", *AIP Adv.* 6 (2016).
14. AV Stier, CT Ellis, J. Kwon, H. Xing, H. Zhang, D. Eason, G. Strasser, T. Morimoto, H. Aoki, H. Zeng, BD McCombe, J. Cerne, "Terahertz Dynamics of a Topologically Protected State: Quantum Hall Effect Plateaus near the Cyclotron Resonance of a Two-Dimensional Electron Gas", *Phys. Rev. Lett.*, 115, 247401 (2015).
15. L. Wang, X. Qin, D. Ji, J. Parry, J. Zhang, C. Deng, G. Ding, Q. Gan, H. Zeng, X. Xu, "Engineering optical properties of metal/porous anodic alumina films for refractometric sensing", *Appl. Surf. Sci.* 355, 139-144 (2015).
16. F. Wang, Y. Sun, J. Hatch, H. Xing, H. Zhang, X. Xu, H. Luo, S. Zhang and H. Zeng, "Realizing chemical co-doping in TiO<sub>2</sub>", *Phys. Chem. Chem. Phys.*, 17, 17989-17994 (2015).
17. D. Li, S. J. Li, Y. T. Zhou, Y. Bai, Y. L. Zhu, W. J. Ren, G. Long, H. Zeng and Z. D. Zhang, "Magnetization reversal and coercivity of Fe<sub>3</sub>Se<sub>4</sub> nanowire arrays", *J. Appl. Phys.*, 117, 17E702 (2015).
18. R. Zhang, S. Qi, J. Jia, B. Torre, H. Zeng, H. Wu and X. Xu, "Size and refinement edge-shape effects of graphene quantum dots on UV-visible absorption", *J. Alloys and Compounds*, 623, 186-191 (2015).
19. D. A. A. Santos, H. Zeng and A. M. Macedo, "Resistive switching: An investigation of the bipolar-unipolar transition in Co-doped ZnO thin films", *Mater. Res. Bull.*, 66, 147-150 (2015).

20. J. Wang, S. Yang, J. Gong, M. Xu, M. Adil, Y. Wang, Y. Zhang, P. Song and H. Zeng, "Simulating magnetic nanotubes using a chain of ellipsoid-rings model with a magnetization reversal process by fanning rotation", *Phys. Chem. Chem. Phys.*, 17, 10250-10256 (2015).
21. X. Qin, J. Zhang, X. Meng, C. Deng, L. Zhang, G. Ding, H. Zeng and X. Xu, "Preparation and analysis of anodic aluminum oxide films with continuously tunable interpore distances", *Appl. Surf. Sci.*, 328, 459-465 (2015).
22. C. Deng, X. Qiao, J. Fan, H. Zeng, X. Xu, "FePt nano-stripes fabricated on anodic aluminum oxide templates", *Chinese Phys. B*, 24, 077504 (2015).
23. C. Yuan, G. Chen, L. Li, J. A. Damasco, Z. Ning, H. Xing, T. Zhang, L. Sun, H. Zeng, A. N. Cartwright, P. N. Prasad, and H. Agren, "Simultaneous Multiple Wavelength Upconversion in a Core-Shell Nanoparticle for Enhanced Near Infrared Light Harvesting in a Dye-Sensitized Solar Cell", *ACS Appl. Mater. & Inter.*, 6, 18018-18025 (2014).
24. M. Agiorgousis, Y.Y. Sun, H. Zeng and S.B. Zhang, "Strong Covalency-Induced Recombination Centers in Perovskite Solar Cell Material  $\text{CH}_3\text{NH}_3\text{PbI}_3$ ", *J. Am. Chem. Soc.* 136, 14570-14575 (2014).
25. J.B. Hatch, L.W. Brooks, T. Wu, G. Long, H. Zeng, G. Sambandamurthy, S. Banerjee and H. Luo, "Intermediate metallic phase in  $\text{VO}_2$  observed with scanning tunneling spectroscopy", *Phys. Chem. Chem. Phys.*, 16, 14183-14188 (2014).
26. H. Zhang, H. Huang, H. Xing, A. Pralle, and H. Zeng, "Monodisperse Magnetofluorescent Nanoplatforms for Local Heating and Temperature Sensing", *Nanoscale* 6, 13463-13469 (2014).
27. X.F. Qin, J.Q. Zhang, X.J Meng, L.F Wang, C.H. Deng, G.Q. Ding, H. Zeng and X.H. Xu, "Effect of ethanol on the fabrication of porous anodic alumina in sulfuric acid", *Surf. & Coat. Tech.* 254, 398-401 (2014).
28. S. He, H. Zhang, K. Li, C. Yang, F. Xue, J. Chen, H. Cui and H. Zeng, "Room Temperature Ferromagnetic  $(\text{Fe}_{1-x}\text{Co}_x)_3\text{BO}_5$  Nanorods", *Nano Lett.*, 14, 3914-3918 (2014).
29. C. H. Deng, F. Wang, P. Taherirostami, R. Q. Zhang, Y. H. Bai, H. Zeng and X. H. Xu, "The morphology and magnetic properties of FePt antidot arrays on porous anodic alumina templates", *IEEE Trans. Magn.*, 50, 2301604 (2014).
30. J. Zhang, X. Qin, B. Torre, H. Zeng and X. Xu, "The Dependence of Magnetic Properties on Diameters of One-Dimensional Nickel Nanostructures", *IEEE Trans. Magn.*, 50, 2301504 (2014).
31. Z.Y. Quan, L. Zhang, W. Liu, H. Zeng, and X.H. Xu, "Resistivity dependence of magnetoresistance in Co/ZnO films", *Nano. Res. Lett.* 9, (2014).
32. J. Tong, J. Parry, Q. Tao, G-H Cao, and H. Zeng, "Magnetic properties of EuCuAs Single Crystal", *Journal of Alloys and Compounds*, 602, 26-31 (2014).
33. J. Tong, H.-L. Luo, Z.-A Xu, H. Zeng, X.-D. Xiao, C.-L. Yang "The effect of thermal annealing of Mo film on the CuInSe<sub>2</sub> layer texture and device performance", *Sol. Energy Mater. Sol. Cells*, 119, 190-195 (2013).
34. C. Xu, H. Zhang, J. Parry, S. Perera, G. Long and H. Zeng, "A Single Source Three-Stage Evaporation Approach to CIGS Absorber Layer for Thin Film Solar Cells", *Sol. Energy Mater. Sol. Cells*, 117, 357-362 (2013).
35. F. Wang, J. Zhang, J. Zhang, C. Wang, Z. Wang, H. Zeng, M. Zhang, X. Xu, "Graded/soft/graded exchange-coupled thin films fabricated by  $[\text{FePt}/\text{C}]_5/\text{Fe}/[\text{C}/\text{FePt}]_5$  multilayer deposition and post-annealing", *Appl. Surf. Science* 271, 390-393 (2013).
36. H. Xing, H. Guo, C. Feng, Z. Xu and H. Zeng "On the origin of the two thermally driven relaxations in diluted spin ice  $\text{Dy}_{1.6}\text{Y}_{0.4}\text{Ti}_2\text{O}_7$ ", *J. Phys: Condens. Matter.* 25, 046005 (2013).
37. M. Alyari, K. Spoth, H. Huang, H. Zhang, H. Zeng, and A. Pralle, "Optimizing of Local Nanoparticle Heating for Thermo-Magnetic Stimulation of Cells", *Biophys. J.* 104, 678A-679A (2013).

38. G. Long, B. Barman, S. Delikanli, Y. T. Tsai, P. Zhang, A. Petrou, and H. Zeng, "Carrier-dopant exchange interactions in Mn-doped PbS colloidal quantum dots", *Appl. Phys. Lett.*, 062410, 101 (2012).
39. G. Long, H. Zhang, D. Li, R. Sabirianov and H. Zeng, "Magnetic anisotropy and coercivity of Fe<sub>3</sub>Se<sub>4</sub> nanostructures", *Appl. Phys. Lett.*, 99, 202103 (2011).
40. G. Long, M. DeMarco, M. Chudyk, J. Steiner, D. Coffey, H. Zeng, Y. K. Li, G. H. Cao and Z. A. Xu, "Coexistence of magnetic fluctuations and superconductivity in SmFe<sub>0.95</sub>Co<sub>0.05</sub>AsO seen in <sup>57</sup>Fe Mossbauer spectroscopy", *Phys. Rev. B*, 84, 064423 (2011).
41. H. Zhang, G. Long, D. Li, R. Sabirianov and H. Zeng, "Fe<sub>3</sub>Se<sub>4</sub> Nanostructures with Giant Coercivity Synthesized by Solution Chemistry" *Chem. Mater.* 23, 3769 (2011).
42. H. Xing, G. Long, H. Guo, Y. Zou, C. Feng, G. Cao, H. Zeng and Z. Xu, "Anisotropic paramagnetism of monoclinic Nd<sub>2</sub>Ti<sub>2</sub>O<sub>7</sub> single crystals", *J. Phys.: Condens. Matter* (2011).
43. H. Huang, S. Delikanli, H. Zeng and A. Pralle, "Remote control of ion-channels and neurons through magnetic field heating of nanoparticles", *Nature Nano.*, 5, 602 (2010).
44. P. Dev, H. Zeng, and P. H. Zhang, "Defect-induced magnetism in nitride and oxide nanowires: Surface effects and quantum confinement", *Phys. Rev. B*, 82, 165319 (2010).
45. H. Xing, M. He, C. Feng, H. Guo, H. Zeng and Z. Xu, "Emergent order in the spin-frustrated system Dy<sub>x</sub>Tb<sub>2-x</sub>Ti<sub>2</sub>O<sub>7</sub> studied by ac susceptibility measurements", *Phys. Rev. B*, 81, 134426 (2010).
46. Y. Zhang, Hui Xing, Narayan Poudyal, Vikas Nandwana, Chuan-bing Rong, Shi-shen Yan, Hao Zeng, and J. P. Liu, "Inversed tunneling magnetoresistance in hybrid FePt/Fe<sub>3</sub>O<sub>4</sub> core/shell nanoparticles systems", *J. Appl. Phys.* 108, 103905 (2010).
47. H. Xing, W. Kong, S. Delikanli, S. Sun, Z. Xu, H. Zeng, "Giant Positive Magnetoresistance in Co/CoO Nanoparticle Arrays", *J. Appl. Phys.* 105, 063920 (2009).
48. C. Wang, C. Xu, H. Zeng, S.H. Sun, "Recent Progress in Syntheses and Applications of Dumbbell-like Nanoparticles," *Adv. Mater.*, 21, 3045-3052 (2009), invited progress report.
49. S. He, H. Zhang, S. Delikanli, Y. Qin, M.T. Swihart, and H. Zeng, "Bifunctional Magneto-Optical FePt-CdS Hybrid Nanoparticles", *J. Phys. Chem. C*, 113, 87-90 (2009).
50. H. Zhang, S. Delikanli, Y. Qin, S. He, M. Swihart, and H. Zeng "Monodisperse CdS Nanorods Catalyzed by Au Nanoparticles", *Nano Res.*, 1, 314-320 (2008).
51. E. Fraser, C.H. Kim, S. Hegde, H. Zeng, H. Luo, P.K. Wei, "Magnetization Reversal in Epitaxial MnAs thin films", *J. Appl. Phys.*, 104, 033921(1-3) (2008).
52. W.C. Law, K.T. Yong, I. Roy, G Xu, H. Ding, E.J. Bergey, H. Zeng and P.N. Prasad, "Optically and magnetically doped organically modified silica nanoparticles as efficient magnetically guided biomarkers for two-photon imaging of live cancer cells", *J. Phys. Chem. C*, 112, 7972-7977 (2008).
53. S. Delikanli, S. He, Y. Qin, P. Zhang, A. Petrou, H. Zeng, H. Zhang and M. T. Swihart, "Room Temperature Ferromagnetism in Mn-doped CdS Nanorods", *Appl. Phys. Lett.* 93, 132501(1-3) (2008).
54. C. Westman, S. Jang, C. Kim, S. He, G. Harmon, N. Miller, B. Graves, N. Poudyal, R. Sabirianov, H. Zeng, M. DeMarco, and J. P. Liu, "Surface finite size effect in nanoparticles," *J. Phys. D: Appl. Phys.*, 41, 225003-225007 (2008).
55. H. Zeng and S. Sun, "Syntheses, Properties, and Potential Applications of Multicomponent Magnetic Nanoparticles," Feature Article in *Adv. Func. Mater.*, 18, 391-400, (2008). Highlighted in *Materials Views*, April, A5, 2008 (Wiley InterScience).
56. S. Jang, W. Kong and H. Zeng, "Magnetotransport in Fe<sub>3</sub>O<sub>4</sub> nanoparticle arrays dominated by surface spin disorder," *Phys. Rev. B*, 76, 212403-1-4, (2007).
57. C. Kim, T. Loedding, S. Jang, H. Zeng, Z. Li, Y. Sui, and D. J. Sellmyer "FePt nanodot arrays with perpendicular easy axis, large coercivity, and extremely high density," *Appl. Phys. Lett.* 91, 172508-1-3, (2007).

58. K. Yong, Y. Sahoo, H. Zeng, M. T. Swihart, J. R. Minter and P. N. Prasad, "Formation of ZnTe Nanowires by Oriented Attachment," *Chem. Mater.* (Communication), 19, 4108-4110, (2007).
59. C.-B. Rong, D. Li, V. Nandwana, N. Poudyal, Y. Ding, Z. L. Wang, H. Zeng, J. P. Liu "Size-Dependent Chemical and Magnetic Ordering in L10-FePt Nanoparticles," *Adv. Mater.* 18, 2984-2988, (2006).
60. W.L. Shi, Y. Sahoo, Hao Zeng, Yong Ding, Mark T. Swihart and P. N. Prasad, "Anisotropic growth of PbSe nanocrystals on Au-Fe<sub>3</sub>O<sub>4</sub> hybrid nanoparticles," *Adv. Mater.* 14, 1889-1894, (2006), *Inside Front Cover article*.
61. W.L. Shi, H. Zeng, Y. Sahoo, T. Y. Ohulchanskyy, Y. Ding, Z. L. Wang, M. Swihart, and P. N. Prasad, "A General Approach to Binary and Ternary Hybrid Nanocrystals," *Nano Lett.*, 6, 875-881, (2006). Highlighted by *Science*, *Editors choice*; ranked the 3<sup>rd</sup> most cited articles published in 2006 by Nano Lett.
62. H. Zeng, C.T. Black, R.L. Sandstrom, P.M. Rice, C.B Murray and S. Sun, "Magnetotransport of magnetite nanoparticle arrays," *Phys. Rev. B* 73, 020402-1-4(R) (2006).
63. S. G. Grancharov, H. Zeng, S. Sun, S. X. Wang, S. O'Brien, C. B. Murray, J. R. Kirtley, and G. A. Held, "Bio-functionalization of monodisperse magnetic nanoparticles and their use as biomolecular labels in a magnetic tunnel junction based sensor," *J Phys. Chem. B* 109, 13030-13035, (2005).
64. D. B. Robinson, H. H. J. Persson, H. Zeng, G. Li, N. Pourmand, S. Sun, and S. X. Wang, "DNA-functionalized MFe<sub>2</sub>O<sub>4</sub> (M = Fe, Co, or Mn) nanoparticles and their hybridization to DNA-functionalized surfaces," *Langmuir* 21, 3096-3103, (2005).
65. Z. Q. Jin, N. N. Thadhani, M. McGill, Y. Ding, Z. L. Wang, M. Chen, H. Zeng, V. M. Chakka and J. P. Liu, "Explosive shock processing of Pr<sub>2</sub>Fe<sub>14</sub>B/alpha-Fe exchange-coupled nanocomposite bulk magnets," *J. Mater. Res.*, 20, 599-609 (2005).
66. H. Zeng, S. H. Sun, J. Li, Z. L. Wang and J. P. Liu, "Tailoring magnetic properties of core/shell nanoparticles," *Appl. Phys. Lett.* 85, 792-794 (2004).
67. H. Zeng, P. M. Rice, S. X. Wang, and S. Sun, "Shape-controlled synthesis and shape-induced texture of MnFe<sub>2</sub>O<sub>4</sub> nanoparticles," *J Am. Chem. Soc.* 126, 11458-11459 (2004).
68. H. Zeng, J. Li, Z. L. Wang, J. P. Liu, and S. Sun, "Bimagnetic core/shell FePt/Fe<sub>3</sub>O<sub>4</sub> nanoparticles," *Nano Lett.* 4, 187-190 (2004).
69. S. Sun, H. Zeng, D. B. Robinson, S. Raoux, P. M. Rice, S. X. Wang, and G. Li "Monodisperse MFe<sub>2</sub>O<sub>4</sub> (M = Fe, Co, Mn) nanoparticles," *J Am. Chem. Soc.* 126, 273-279 (2004).
70. F. X. Redl, C. T. Black, G. C. Papaefthymiou, R. L. Sandstrom, M. Yin, H. Zeng, C. B. Murray, and S. P. O'Brien, "Magnetic, electronic, and structural characterization of nonstoichiometric iron oxides at the nanoscale," *J Am. Chem. Soc.* 126, 14583-14599 (2004).
71. J. Li, H. Zeng, S. Sun, J. P. Liu, and Z. L. Wang, "Analyzing the structure of CoFe-Fe<sub>3</sub>O<sub>4</sub> core-shell nanoparticles by electron imaging and diffraction," *J Phys. Chem. B* 108, 14005-14008 (2004).
72. L. Krusin-Elbaum, D. M. Newns, H. Zeng, V. Derycke, J. Z. Sun and R. Sandstrom, "Room-temperature ferromagnetic nanotubes controlled by electron or hole doping," *Nature* 431, 672-676 (2004).
73. Z. Q. Jin, N. N. Thadhani, M. McGill, J. Li, Y. Ding, Z. L. Wang, H. Zeng, M. Chen, S. F. Cheng, J. P. Liu, "Grain size dependence of magnetic properties in shock synthesized bulk Pr<sub>2</sub>Fe<sub>14</sub>B/alpha-Fe nanocomposites," *J Appl. Phys.* 96, 3452-3457 (2004).
74. Z. Q. Jin, K. H. Chen, J. Li, H. Zeng, S. F. Cheng, J. P. Liu, Z. L. Wang and N. N. Thadhani, "Shock compression response of magnetic nanocomposite powders," *Acta. Mater.* 52, 2147-2154 (2004).
75. G. A. Held, H. Zeng, and S. H. Sun, "Magnetics of ultrathin FePt nanoparticle films," *J Appl. Phys.* 95, 1481-1484 (2004).
76. S. Demirtas, A. R. Koymen, and H. Zeng, "Oscillatory temperature dependence of exchange bias for Fe/Gd ferrimagnets," *J Phys.-Condens. Mat.* 16, L213-L220 (2004).

77. K. H. Chen, Z. Q. Jin, J. Li, G. Kennedy, Z. L. Wang, and N. N. Thadhani, H. Zeng, S.-F. Cheng and J. P. Liu, "Bulk nanocomposite magnets produced by dynamic shock compaction," *J Appl. Phys.* 96, 1276-1278 (2004).
78. H. Zeng, S. Sun, R. L. Sandstrom and C. B. Murray, "Chemical ordering of FePt nanoparticle self-assemblies by rapid thermal annealing," *J Magn. Magn. Mater.* 266, 227-232 (2003).
79. T. S. Vedantam, J. P. Liu, H. Zeng and S. Sun, "Thermal stability of self-assembled FePt nanoparticles," *J Appl. Phys.* 93, 7184-7186 (2003).
80. J. Li, Z. L. Wang, H. Zeng, S. Sun and J. P. Liu "Interface structures in FePt/Fe<sub>3</sub>Pt hard-soft exchange-coupled magnetic nanocomposites," *Appl. Phys. Lett.* 82, 3743-3745 (2003).
81. K. E. Elkins, T. S. Vedantam, J. P. Liu, H. Zeng, S. Sun, Y. Ding, and Z. L. Wang, "Ultrafine FePt nanoparticles prepared by the chemical reduction method," *Nano Lett.* 3, 1647-1649 (2003).
82. H. Zeng, M. L. Yan, N. Powers, and D. J. Sellmyer, "Orientation-controlled nonepitaxial L1(0) CoPt and FePt films," *Appl. Phys. Lett.* 80, 2350-2352 (2002).
83. H. Zeng, S. Sun, T. S. Vedantam, J. P. Liu, Z.-R. Dai and Z.-L. Wang, "Exchange-coupled FePt nanoparticle assembly," *Appl. Phys. Lett.* 80, 2583-2585 (2002).
84. H. Zeng, R. Skomski, L. Menon, Y. Liu, S. Bandyopadhyay, and D. J. Sellmyer, "Structure and magnetic properties of ferromagnetic nanowires in self-assembled arrays," *Phys. Rev. B* 65, 134426-1-8 (2002).
85. H. Zeng, Z. S. Shan, Y. Liu, M. Azarisooreh, K. Honardoost and D. J. Sellmyer, "Studies of the magnetic and reversal properties for thin CoCrTa films," *J Magn. Magn. Mater.* 251, 283-291 (2002).
86. H. Zeng, R. Sabirianov, O. Mryasov, M. L. Yan, K. Cho, and D. J. Sellmyer, "Curie temperature of FePt: B<sub>2</sub>O<sub>3</sub> nanocomposite films," *Phys. Rev. B* 66, 184425-1-6, (2002).
87. H. Zeng, S Michalski, R D Kirby, D J Sellmyer, L Menon and S Bandyopadhyay, "Effects of surface morphology on magnetic properties of Ni nanowire arrays in self-ordered porous alumina," *J Phys.-Condens. Mat.* 14, 715-721 (2002).
88. H. Zeng, Jing Li, Wang, Z.L. Liu, J.P and S. Sun, "Interparticle interactions in annealed FePt nanoparticle assemblies," *IEEE Trans. Magn.* 38, 2598-2600 (2002).
89. H. Zeng, J. Li, J. P. Liu, Z. L. Wang and S. Sun, "Exchange-coupled nanocomposite magnets by nanoparticle self-assembly," *Nature* 420, 395-398 (2002).
90. M. L. Yan, H. Zeng, N. Powers, and D. J. Sellmyer, "L1(0),(001)-oriented FePt: B<sub>2</sub>O<sub>3</sub> composite films for perpendicular recording," *J Appl. Phys.* 91, 8471-8473 (2002).
91. S. H. Sun and H. Zeng, "Size-controlled synthesis of magnetite nanoparticles," *J Am. Chem. Soc.* 124, 8204-8205 (2002).
92. R. Skomski, H. Zeng, and D. J. Sellmyer, "Incoherent magnetization reversal in nanowires," *J Magn. Magn. Mater.* 249, 175-180 (2002).
93. Z.S. Shan, J.P. Liu, V.M. Chakka, H. Zeng, J.S. Jiang, "Energy barrier and magnetic properties of exchange-coupled hard-soft bilayer," *IEEE Trans. Magn.* 38, 2907-2909 (2002).
94. H. Zeng, M. L. Yan, Y. Liu and D. J. Sellmyer, "CoPtCr: C nanocomposite films for high density recording," *J Appl. Phys.* 89, 810-812 (2001).
95. R. Skomski, H. Zeng, D.J. Sellmyer, "Grain-boundary micromagnetism," *IEEE Trans. Magn.* 37, 2549-2551 (2001).
96. L. Menon, S. Bandyopadhyay, Y. Liu, H. Zeng and D.J. Sellmyer, "Magnetic and structural properties of electrochemically self-assembled Fe<sub>1-x</sub>Cox nanowires," *J Nanosci. Nanotechnol.* 1, 149-152 (2001).
97. M. Zheng, L. Menon, H. Zeng, Y. Liu, S. Bandyopadhyay, R. D. Kirby, and D. J. Sellmyer, "Magnetic properties of Ni nanowires in self-assembled arrays," *Phys. Rev. B* 62, 12282-12286 (2000).

98. H. Zeng, M. Zheng, R. Skomski, D. J. Sellmyer, Y. Liu, L. Menon and S. Bandyopadhyay, "Magnetic properties of self-assembled Co nanowires of varying length and diameter," *J Appl. Phys.* 87, 4718-4720 (2000).
99. R. Skomski, H. Zeng, M. Zheng and D. J. Sellmyer, "Magnetic localization in transition-metal nanowires," *Phys. Rev. B* 62, 3900-3904 (2000).
100. L. Menon, M. Zheng, H. Zeng, S. Bandyopadhyay and D. J. Sellmyer, "Size dependence of the magnetic properties of electrochemically self-assembled Fe quantum dots," *J Electron. Mater.* 29, 510-514 (2000).
101. M.F. Doerner, T. Kai, T. Arnoldussen, H. Zeng, M.F. Toney, D.K. Weller, "Microstructure and thermal stability of advanced longitudinal media," *IEEE Trans. Magn.* 36, 43-47 (2000).
102. Z. S. Shan, H. Zeng, C. X. Zhu, M. Azarisooreh, K. Honardoost, Y. Liu and D. J. Sellmyer, "Effects of layer thickness on orientation distribution and magnetic properties of CoCrTa/Cr films," *J Appl. Phys.* 85, 4310-4312 (1999).
103. S. Bandyopadhyay, L. Menon, N. Kouklin, H. Zeng and D. J. Sellmyer, "Electrochemically self-assembled quantum dot arrays," *J Electron. Mater.* 28, 515-519 (1999).
104. G. Gu, W. Ding, G. Cheng, W. Zang, H. Zeng, and Y. Du, "Very Intensive Red-light Emission From C60 Trapped in 13X Molecular-Sieve," *Appl. Phys. Lett.* 67, 326-328 (1995).
105. G. Gu, W. Ding, G. Cheng, W. Zang, H. Zeng, Y.W. Du, "Enhanced Photoluminescence from C60 Trapped in NAY Molecular-sieve," *Modern Phys. Lett. B* 9, 1327-1332 (1995).
106. G. Gu, W. Zang, H. Zeng, Y.W. Du et al., "Photoacoustic Spectroscopy Measurement of C60 Thin Film," *Chinese Phys. Lett.* 11, 102-104 (1994).
107. G. Gu, W. Zhang, H. Zeng, Y. Du, Y. Han, W. Zhang, F. Dong and Y. Xia, "Large Nonlinear Absorption in C60 Thin Films," *J. Phys. B: At. Mol. Opt. Phys.* 26, L451-L455 (1993).

## BOOKS and BOOK CHAPTERS

1. Nanoparticle Magnetism  
H. Zeng, in *Recent Progress in Chemical Nanotechnology- From Quantum Dots to Nanowires*, ed. Deeder Aurongzeb, to be published by research signpost.
2. NEW MAGNETIC RECORDING MATERIALS  
Y. Liu, M. Yan, S. Sun and H. Zeng in *Handbook of Advanced Magnetic Materials* ed. Y. Liu, D.J. Sellmyer and D. Shindo, Springer Verlag (2006).
3. MAGNETIC NANOCRYSTALS AND ARRAYS  
Y. Liu, M. Zheng, H. Zeng, and D.J. Sellmyer, in *Nanophase and Nanostructured Materials*, eds. Z.L. Wang, Y. Liu, and Z. Zhang, Kluwer Academic/Plenum Publishers and Tsinghua University Press, Vol. 3, p. 215 (2003).
4. NANOSCALE MATERIALS FOR EXTREMELY HIGH- DENSITY RECORDING  
D.J. Sellmyer, C.P. Luo, Hao Zeng, in *Magnetic Storage Systems Beyond 2000*, Ed. G.C. Hadjipanayis (Kluwer Academic Publishers, Dordrecht, 2001), p. 163-170.

## PATENTS

1. "Process of making magnetic nanocomposites via nanoparticle self-assembly," with Shouheng Sun, US Patent 6972046.
2. "A Single Source Three-Stage Evaporation Approach to CIGS Absorber Layer," patent invention disclosure to STOR.



## INVITED CONFERENCE TALKS

1. “Chalcogenide Perovskites –an Emerging Class of Semiconductors for Photovoltaics”, the Material Research Society Spring Meeting, Phoenix, AZ, Apr. 2018.
2. “Tunable valley splitting in WSe<sub>2</sub> and WS<sub>2</sub> by exchange field”, 62nd Annual Conference on Magnetism and Magnetic Materials, Pittsburgh, PA, Nov 2017.
3. “Tuning valley splitting in TMDCs by exchange field”, the first International Semiconductor Conference for Global Challenges, Nanjing, China, July 2017.
4. “Exchange enhanced valley splitting in monolayer TMDCs”, 9<sup>th</sup> International Conference on Materials for Advanced Technologies, Singapore, June 2017.
5. “Exchange enhanced valley splitting in WSe<sub>2</sub>”, The 2nd International Workshop on Spintronics Memory and Logic, Qingdao, China, June 2017.
6. “Chalcogenide Perovskites –an Emerging Class of Semiconductors”, Nature Conference on Flexible electronics and International Symposium on Optoelectronics, Materials, and Energy, Nanjing, June 2016.
7. “Magneto-fluorescent Nanoplatfoms for RF heating and local temperature Sensing,” International forum on Advanced Functional Materials and Polymer Materials, plenary talk, Qingdao, China, May 2015.
8. “Nanoparticle Platfoms for RF Field heating and local temperature Sensing,” Zing Nanocrystals Conference, Punta Cana, Dominican Republic, July 2014.
9. “Field dependent Magnetic Polaron Energy in Colloidal CdMnSe Quantum Dots,” Collaborative Conference on Materials Research-2014, Seoul, Korea, June 2014.
10. “Probing Carrier-Dopant Exchange Interactions in Colloidal Quantum Dots with Magneto-optics,” International Workshop on Spintronics and Acoustics, Jinan, China, April 2014.
11. “Functional Nanostructures – From Superparamagnetic to Diluted Magnetic to Nonmagnetic”, Symposium on nanostructured magnetic materials, Ningbo Institute of Materials Technology and Engineering, CAS, China, July 2013.
12. “Tuning Carrier-Dopant Exchange Interactions in Colloidal Quantum Dots and Heterostructures,” Workshop on Computational Physics in Magnetic Semiconductor Nanostructures, Hsinchu, Taiwan, Mar 2013.
13. “Biological Applications of Magnetic Nanoparticles,” CMOS Emerging Technologies Conference, Vancouver, July 2012.
14. “Materials for Photovoltaics,” 2012 ICQD Summer School on Frontiers of Quantum Materials, University of Science and Technology of China, Hefei, China, July 2012.
15. “Titania Nano-arrays for Dye Sensitized Solar Cells and Radial Heterojunction Solar Cells,” Materials Research Society Spring Meeting, San Francisco, CA, Apr. 2012.
16. “Spin Dynamics in Frustrated Magnets,” Summer School of Advanced Functional Materials 2011, International Centre for Materials Physics, Chinese Academy of Sciences, Shenyang, China, July 2011.
17. “Remote control of ion channels and neurons through local magnetic-field heating of a nanoparticle array,” IEEE International Magnetic Conference, Taipei 2011.
18. “Carrier Dopant Interactions in DMS Quantum Dots,” Summer School of Advanced Functional Materials 2010, International Centre for Materials Physics, Chinese Academy of Sciences, Shenyang, China, July 2010.
19. “Carrier Spin Polarization Probed by Circularly Polarized Magneto-Photoluminescence”, International Workshop on Nanomagnetism and Spintronics, Linfen, Shanxi, July 2010.
20. “Manipulating Spin and Magnetism in Nanostructures”, 2<sup>nd</sup> Workshop for US-China Earlier Career Chemical Scientists, Beijing, China, Oct. 2009.
21. “Magnetic Nanoparticles-Size, Surface Effects and Ultrafast Demagnetization”, 2<sup>nd</sup> Workshop of International Center for Quantum Design, University of Science and Technology of China, Hefei, China, July 2009.

22. "Introduction to Magnetism, magnetic Materials and Applications" Quantum Design of Materials Summer School, University of Science and Technology China, July 2009.
23. "Synthesis, Characterization and AC Field Heating of Hybrid Nanostructures", The Seventeenth Annual International Conference on COMPOSITES/NANO ENGINEERING, Hawaii, July 2009.
24. "Ultrafast Optical Diagnostics of Surface/Interface Magnetization and Magnetization Reorientation in Fe Film and Nanoparticle Arrays" The Seventeenth Annual International Conference on COMPOSITES/NANO ENGINEERING, Hawaii, July 2009.
25. "Ferromagnetism in Non-conventional Materials," Workshop on Novel Phenomena at Nanoscale Interfaces, Hsinchu, Taiwan, Dec 2008.
26. "Multicomponent nanoparticles by solution phase synthesis," Progress in Electromagnetics Research Symposium, Cambridge, USA, July 2008.
27. "Magnetism of FePt nanoparticles and nanodot arrays," the Annual American Physical Society March Meeting, New Orleans, LA, Mar 2008.
28. "Multi-component Nanostructures combining magnetic, plasmonic, and semiconducting functionalities," the Material Research Society Fall Meeting, Boston, MA, Nov 2007.
29. "Solution Phase Synthesized Magnetic Nanoparticles and Hybrids," International Conference on Materials for Advanced Technologies, Singapore, July 2007.
30. "FePt Nanomaterials for Future Magnetic Data Storage," Advanced Materials Summer School lecture, Institute of Metals Research, Chinese Academy of Sciences, Shenyang, China, June 2006.
31. "Nanoparticle Building Blocks for Functional Materials and Devices", Advanced Materials Summer School lecture, Institute of Metals Research, Chinese Academy of Sciences, Shenyang, China, June 2006.
32. "Fundamentals and Opportunities of Nanomagnetism," MURI Rare-Earth Magnets Workshop, Boston, MA, Nov 2005.
33. "Magnetic nanocomposite materials-nanoparticle approach," 31st American Chemical Society NorthEastern Regional Meeting, Saratoga Springs, NY, June, 2003.
34. "Nanoscience and Nanotechnology-the IBM Perspective," TxBESS (Texas Beginning Educator Support System) Conference, Arlington, TX, May 2003.
35. "Magnetic interactions in FePt-based nanoparticle assembly," Fourth International Conference on Fine Particle Magnetism, Pittsburgh, PA, Aug. 2002.

### **INVITED COLLOQUIA and SEMINARS**

1. "Chalcogenide compounds as emerging classes of functional materials," University of Wyoming, Laramie, WY, Oct 10, 2017.
2. "Chalcogenide compounds as emerging classes of functional materials," Colorado State University, Fort Collins, CO, Oct 9, 2017.
3. "Chalcogenide Compounds-A Magical Class of Functional Materials," University of Waterloo, Waterloo, ON, Canada, Aug 24, 2017.
4. "Chalcogenide compounds as emerging classes of functional materials," Institute of Physics, Chinese academy of Sciences, Beijing, Aug 2017.
5. "Chalcogenide compounds as emerging classes of functional materials," Peking University, Beijing, July 2017.
6. "Chalcogenide Compounds-A Magic Class of Functional Materials," Nanyang Technological University, Singapore, June 2017.
7. "An introduction to Magnetism and Magnetic Materials," Xi'an Jiaotong University, Xi'an, China July 2014.

8. "Magnetofluorescent Nano-platforms for Localized RF-Heating and Nanoscale Temperature Sensing," Northwest University, Xi'an China, June 2014.
9. "Carrier Dopant Interactions in CdMnSe Quantum Dots and Magnon Thermopower in FePt Thin Films," Peking University, Beijing, China, June 2013.
10. "Processing and Properties of FePt Materials," Shandong University, Jinan, China, July 2013.
11. "Doping Semiconductor Quantum Dots," Institute of Semiconductors, CAS, Beijing, China, June 2012.
12. "Doping Semiconductor Quantum Dots," Xi'an Jiaotong University, Xi'an, China, June 2012.
13. "Doping Semiconductor Quantum Dots," Institute of Metal Research, Chinese Academy of Sciences, Shengyang, China, June 2012.
14. "Magnetic Nanostructures –Fabrication and Applications," Changchun Institute of Science and Technology, Changchun, China June 2012.
15. "DSSC Based on Free-Standing TiO<sub>2</sub> Nanotube Arrays and Chemical co-doping of TiO<sub>2</sub> for Photocatalysis," Shanxi Normal University, Linfen, Shanxi, June 2012.
16. "DSSC Based on Free-Standing TiO<sub>2</sub> Nanotube Arrays and Chemical co-doping of TiO<sub>2</sub>," Capital Normal University, Beijing, China, May 2012.
17. "Carrier-dopant Interactions in Colloidal DMS Quantum Dots," Huazhong University of Science and Technology, Wuhan, China, July 2012.
18. "Fabrication and Applications of Magnetic Nanostructures," Li Xun Lecture series, Institute of Metal Research, Chinese Academy of Sciences, Shengyang, China, July 2011.
19. "Magnetic Nanoparticles-Applications in Spintronics and Biomagnetics," Seminar, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, Shenzhen, China, July 2011.
20. "Spin Relaxation in Frustrated Magnets," Seminar, Hefei National Laboratory for Physical Sciences at the Microscale, Hefei, China, June 2011.
21. "Magnetic Nanoparticles-Applications in Spintronics and Biomagnetics," Seminar, Hefei National High Magnetic Field Lab, Hefei, China, June 2011.
22. "Magnetic Nanoparticles-Applications in Spintronics and Biomagnetics," seminar, Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, China, June 2011.
23. "Magnetism 101," Lecture, Zhejiang University, Hangzhou, China, May 2011.
24. "Magnetic Nanoparticles-Applications in Spintronics and Biomagnetics", seminar, Shandong University, Shandong, China, May 2011.
25. "Magnetic Nanoparticles-Applications in Data Storage, Spintronics and Biomagnetics," Lecture, Jiangnan University, Wuxi, China, May 2011.
26. "Magnetism and Spintronics," Seminar, Capital Normal University, Beijing, China, May 2011.
27. "Dye Sensitized Solar cells," Seminar, Capital Normal University, Beijing, China, May 2011.
28. "Magnetic Nanoparticles-Applications in Spintronics and Biomagnetics," Seminar, Shanxi University, Taiyuan, China, April, 2011.
29. "Magnetic Nanoparticles-Applications in Biology," Shanxi Normal University, Linfen, China, April 2011.
30. "Magnetic Nanoparticles-Applications in Spintronics and Biomagnetics," Seminar, Hefei National Laboratory for Physical Sciences at the Microscale, Hefei, China, June 2010.
31. "Carrier-Spin Polarization in DMS Quantum Dots," Seminar, National Center of Nanoscience and Technology, Beijing, China, June 2010.
32. "Magnetic Nanoparticles-Size, Surface Effects and Ultrafast Spin Dynamics," Colloquium, National Laboratory for Solid State Microstructures and Department of Physics, Nanjing University, Nanjing, China, July 2009.
33. "Magnetic Nanostructures for Spintronics," Seminar, International Center for Quantum Design, University of Science and Technology of China, Hefei, China, July 2009.
34. "Synthesis of Magnetic Nanoparticles and Their Applications," Colloquium, Xiamen University, Xiamen, China, July 2009.

35. "Synthesis, Characterization and Bio-applications of Magnetic Nanoparticles," Colloquium, Xi'an Jiao Tong University, Xi'an, China, July 2009.
36. "Spin Engineering in Nanostructures," Colloquium, Hunter College, City University of New York, New York, Oct 2008.
37. "Spin Engineering in Nanostructures," Colloquium, Zhejiang University, Hangzhou, China, June 2008.
38. "Spin Engineering in Nanostructures," Colloquium, Institute of Physics, Chinese Academy of Sciences, Beijing, China, June 2008.
39. "Magnetism and Spin dependent Charge Transport in Nanostructures," Colloquium, Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, China, June 2008.
40. "Spin engineering in Nanostructures," Colloquium, Peking University, Beijing, China, June 2008.
41. "Spin engineering in Nanostructures," Colloquium, Shandong University, Jinan, China, June 2008.
42. "Multifunctional Nanostructures via Chemical Routes," Physics and Chemistry colloquium, Hong Kong University of Science and Technology, Hong Kong, July 2007.
43. "Multifunctional Nanostructures via Chemical Routes," Colloquium, Fudan University, Shanghai, China, July 2007.
44. "Magnetism and Magneto-transport in Nanoparticles," Colloquium, Data Storage Institute, Singapore, July 2007.
45. "Multifunctional Nanostructures via Chemical Routes," Physics Colloquium, National University of Singapore, Singapore, June 2007.
46. "Magnetism and Spin Dependent Transport in Nanoparticles," MINT and Physics colloquium, University of Alabama, Tuscaloosa, Alabama, Apr. 2007.
47. "Nanoparticle Building Blocks for Functional Materials and Devices," Physics Colloquium, Zhejiang University, Hangzhou, China, Dec. 2006.
48. "Nanoparticle Building Blocks for Functional Materials and Devices," Physics Colloquium, Northeastern University, Boston, MA, Oct 2006.
49. "Nanoparticle Building Blocks for Functional Materials and Devices", Colloquium, Wenzhou University, Wenzhou, China, July 2006.
50. "Nanoparticle Building Blocks for Functional Materials and Devices," Materials Science colloquium, Brook Haven National Laboratory, Apr. 2004.
51. "Nanotechnology-the IBM Perspective," Public lecture, Westchester Medical College, Valhalla, NY, Apr, 2004.
52. "Magnetic Nanoparticle Building Blocks for Functional Materials and Devices," Physics colloquium, Virginia Polytechnic Institute and State University, Blacksburg, VA, Mar. 2004.
53. "Magnetic Nanoparticle Building Blocks for Functional Materials and Devices," Physics colloquium, SUNY at Buffalo, Buffalo, NY, Jan. 2004.
54. "Nanoparticle Building Blocks for Functional Materials and Devices," Physics colloquium, New Jersey Institute of Technology, Newark, NJ Oct 2003.
55. "Nanoparticle Building Blocks for Functional Materials and Devices," Physics colloquium, University of Nebraska, Lincoln, NE, Aug. 2003.
56. "Nanoparticle Building Blocks for Functional Materials and Devices," Physics colloquium, University of Texas-Arlington, Arlington, TX, May 2003.

## **CONTRIBUTED CONFERENCE PRESENTATIONS**

1. "Pressure and Temperature Dependent Raman Spectroscopy of Chalcogenide Perovskites," New Orleans, LA, March 2017.

2. "Exchange field induced valley splitting in monolayer WSe<sub>2</sub> and WS<sub>2</sub>," New Orleans, LA, March 2017.
3. "Deciphering chemical order/disorder and magnetic properties of FePt nanoparticle at the single-atom level," New Orleans, LA, March 2017.
4. "Band gap engineering of BaZrS<sub>3</sub> by Ti doping," New Orleans, LA, March 2017.
5. "Magneto-optical studies of transition-metal dichalcogenides using visible pump, mid-infrared probe measurements," New Orleans, LA, March 2017.
6. "Electron density dependent Zeeman splitting in WS<sub>2</sub> single layer," APS March Meeting, New Orleans, LA, March 2017.
7. "Strongly enhanced valley splitting in monolayer transition metal dichalcogenides due to magnetic exchange field," 61<sup>st</sup> Annual Magnetism and Magnetic Materials Conference, New Orleans, LA, Nov 2016.
8. "Chalcogenide Perovskites –an Emerging Class of Ionic Semiconductors," 33rd International Conference on the Physics of Semiconductors, Beijing, China, Aug. 2016.
9. "Enhanced AC Field Heating by Tuning the Anisotropy of Ferrite Nanoparticles," 9<sup>th</sup> International Conference on Fine Particle Magnetism, Gaithersburg, MD, June 2016.
10. "Transition metal chalcogenide magnetic nanoparticles with high coercivity" 9<sup>th</sup> International Conference on Fine Particle Magnetism, Gaithersburg, MD, June 2016.
11. "Synthesis and characterization of chalcogenide perovskites for PV absorbers," the Annual MRS spring meeting, Phoenix, AZ, Apr 2016.
12. "The Application of a Superabsorber in FePt HAMR Media," the Annual MRS spring meeting, Phoenix, AZ, Apr 2016.
13. "Enhanced Valley Zeeman Splitting in MoS<sub>2</sub>/EuS due to interfacial exchange field," APS March Meeting, Baltimore, MD, March 2016.
14. "Infrared and visible magneto-optical studies of centimeter-scale monolayer MoS<sub>2</sub>," APS March Meeting, Baltimore, MD, March 2016.
15. "Enhanced Hyperthermia Capability by Tuning the Anisotropy of Ferrite Nanoparticles," MMM/Intermag 2016 Joint Conference, San Diego, CA, Jan 2016.
16. "Solution Phase Synthesis of Zr<sub>2</sub>Co<sub>11</sub> Nanoparticles," MMM/Intermag 2016 Joint Conference, San Diego, CA, Jan 2016.
17. "Chemically synthesized CrTe nanostructures with hard magnetic properties," MMM/Intermag 2016 Joint Conference, San Diego, CA, Jan 2016.
18. "Solution synthesis of Fe<sub>1-x</sub>Cr<sub>x</sub>Te nanostructures," IEEE International Magnetics Conference, Beijing 2015.
19. "CoPt antidot arrays fabricated with dry-etching using AAO templates," IEEE International Magnetics Conference, Beijing 2015.
20. "Phosphine-Free Synthesis of Iron Selenide Nanocrystals," IEEE International Magnetics Conference, Beijing 2015.
21. "Evidence for a magnetic metallic R phase in Vanadium dioxide VO<sub>2</sub>," APS March Meeting, San Antonio, TX, March 2015.
22. "Magneto-optical studies of MoS<sub>2</sub>," APS March Meeting, San Antonio, TX, March 2015.
23. "Large Area Growth and Characterization of Monolayer MoS<sub>2</sub>," APS March Meeting, San Antonio, TX, March 2015.
24. "Monodisperse magnetofluorescent nanoplatforms for RF heating and local temperature sensing," 59th Annual Magnetism and Magnetic Materials Conference, Honolulu, HI, 2014.
25. "Room Temperature Ferromagnetic (Fe<sub>1-x</sub>Co<sub>x</sub>)<sub>3</sub>BO<sub>5</sub> Nanorods," 59th Annual Magnetism and Magnetic Materials Conference, Honolulu, HI, Nov 2014.
26. "Infrared Hall effect measurements in iron pnictide superconductors," APS March Meeting, Denver, CO, March 2014.
27. "FePt/Fe Exchange Coupled Patterned Films using Self-organized Templates," 58th Magnetism and Magnetic Materials Conference, Denver, CO, Nov 2013.

28. "Magnon-Drag Thermopower in FePt Thin Films," 58th Magnetism and Magnetic Materials Conference, Denver, CO, Nov 2013.
29. "Enhancement of solar absorption with black Cu<sub>2</sub>O Nanostructures," APS March Meeting, Baltimore, MD, March 2013.
30. "Magnetization and scanning tunneling spectroscopy studies of Mn<sub>1.5</sub>Ga films on GaAs(001)," APS March Meeting, Baltimore, MD, March 2013.
31. "Monodisperse Magneto-Fluorescent Bifunctional Nanoprobes for Bioapplications," APS March Meeting, Baltimore, MD, March 2013.
32. "Thermopower of FePt granular thin film," 12th Joint MMM/Intermag Conference, Chicago, IL, Jan 2013.
33. "Magnetophotoluminescence studies of PbMnS quantum dots," APS March Meeting, Boston, MA, March 2012.
34. "Magnetothermal transport in monoclinic Nd<sub>2</sub>TiO<sub>7</sub>," APS March Meeting, Boston, MA, March 2012.
35. "Tunable carrier spin polarization in PbMnS through quantum confinement," APS March Meeting, Boston, MA, March 2012.
36. "Fabrication of nanostructured CIGS solar cells," APS March Meeting, Boston, MA, March 2012.
37. "Field-induced slow spin relaxation in monoclinic Nd<sub>2</sub>Ti<sub>2</sub>O<sub>7</sub>," 56th Magnetism and Magnetic Materials Conference, Phoenix, AZ, Nov 2011.
38. "Synthesis of Ferrimagnetic Fe<sub>3</sub>Se<sub>4</sub> Nanostructures with Giant Coercivity," APS March Meeting, Dallas, TX, March 2011.
39. "Anisotropic paramagnetism in monoclinic Nd<sub>2</sub>Ti<sub>2</sub>O<sub>7</sub> single crystals," APS March Meeting, Dallas, TX, March 2011.
40. "Investigation of SmFe<sub>1-x</sub>Co<sub>x</sub>AsO using <sup>57</sup>Fe Mossbauer spectroscopy as a function of temperature and applied magnetic field," the American Physical Society March Meeting, Portland, OR, March 2010.
41. "Metal-Insulator Transition in W-doped VO<sub>2</sub> Nanowires," the American Physical Society March Meeting, Portland, OR, March 2010.
42. "Laser induced ultrafast magnetization reorientation in two dimensional arrays of Fe nanoparticles," the American Physical Society March Meeting, Portland, OR, March 2010.
43. "Surface Induced Suppression of Magnetization and Surface magnetization Reversal in Magnetic Nanoparticles," the American Physical Society March Meeting, Portland, OR, March 2010.
44. "Dye Sensitized Solar Cells Based on Free-standing TiO<sub>2</sub> Nanotube," the American Physical Society March Meeting, Portland, OR, March 2010.
45. "Magnetism and Carrier Spin Polarization in Mn-doped CdSe Quantum Dots," the American Physical Society March Meeting, Portland, OR, March 2010.
46. "RF Field Heating of Magnetic Nanoparticles for Remote Control of Ion Channels," 11<sup>th</sup> Joint MMM-Intermag Conference, Washington DC, Jan 2010.
47. "Study on Room Temperature Ferromagnetism by doping transition metals in ZnO nanowires," 11<sup>th</sup> Joint MMM-Intermag conference, Washington DC, Jan 2010.
48. "Magnetism in Semiconductor Oxide Nanowires," The 3rd International Conference on One-dimensional Nanomaterials, Atlanta, GA, Dec 2009.
49. "Giant positive magnetoresistance in Co@CoO nanoparticle array," the American Physical Society March Meeting, New Orleans, LA, March 2009.
50. "Spin polarization of doped II-VI nanocrystals," the American Physical Society March Meeting, New Orleans, LA, March 2009.
51. "Carrier Spin Polarization in CdMnSe Colloidal QDs," 53<sup>nd</sup> Magnetism and Magnetic Materials Conference, Austin, TX, Nov 2008.

52. "Self-assembled magnetic nanodot array," Progress in Electromagnetics Research Symposium, Cambridge, July 2008.
53. "Size dependent magnetic properties of magnetite ( $\text{Fe}_3\text{O}_4$ ) nanoparticles," the American Physical Society March Meeting, New Orleans, LA, March 2008.
54. "Surface induced reduction of magnetization in nanoparticles with competing exchange interactions," annual MRS fall meeting, Boston, MA, 2007.
55. "Coherent growth of semiconductor nanocrystals on FePt nanoparticles," annual MRS fall meeting, Boston, MA, 2007.
56. "Magnetic and magneto-transport properties of epitaxial MnAs thin films," 52<sup>nd</sup> Magnetism and Magnetic Materials Conference, Tampa, FL, Nov 2007.
57. "A novel temperature dependent hysteresis behaviour of Co nanodot arrays," 52<sup>nd</sup> Magnetism and Magnetic Materials Conference, Tampa, FL, Nov 2007.
58. "Magnetic Properties of Self-organized Nanodot Arrays," 10<sup>th</sup> joint MMM-Intermag conference, Baltimore, MD, Jan 2007.
59. "Electron Transport Properties of Co Nanodot Arrays," the American Physical Society March Meeting, Denver, CO, Mar 2007.
60. "Ferromagnetic resonance studies in Cobalt nanodot array," the American Physical Society March Meeting, Denver, CO, Mar 2007.
61. "Charge Transport in Magnetite Nanoparticles," the American Physical Society March Meeting, Denver, CO, Mar 2007.
62. "Phonons and Phonon-Mixing in ZnSe Isotopic Crystals, Pressure-cycled Domains, and Nanorods," International Conference on Semiconductor Physics, Vienna, Austria, July 2006.
63. "Non-lithographic Fabrication of Magnetic Nanodot Arrays," the American Physical Society March Meeting, Baltimore, MD, Mar 2006.
64. "Magnetism of Discrete, L10 Ordered FePt Nanoparticles," the American Physical Society March Meeting, Baltimore, MD, Mar 2006.
65. "Hybrid colloidal nanostructures with paired plasmonic, semiconducting and magnetic functionalities," annual MRS fall meeting, Boston, MA, 2005.
66. "Magnetic Properties of Au/Fe<sub>3</sub>O<sub>4</sub> Hybrid Nanostructures," 50th Annual Conference on Magnetism and Magnetic Materials, San Jose, CA, Apr 2005.
67. "Magnetoelastic anisotropy and exchange bias in [FeCo/TbFe]<sub>3</sub> multilayer films," 50th Annual Conference on Magnetism and Magnetic Materials, San Jose, CA, Apr 2005.
68. "A general strategy for hybrid nanoparticle synthesis," AIChE annual meeting, Cincinnati, OH, 2005.
69. Epitaxial growth of heterostructure nanoparticles MRS, 2005.
70. "Iron oxide nanoparticles for DNA detection," 49th Annual Conference on Magnetism and Magnetic Materials, Jacksonville, FL, Nov, 2004.
71. "Shape induced texture of manganese ferrite nanoparticles in self-assembled superlattices," 49th Annual Conference on Magnetism and Magnetic Materials, Jacksonville, FL, Nov, 2004.
72. "Iron oxide nanoparticles for DNA detection," annual MRS fall meeting, Boston, MA, 2004.
73. "Oscillatory Exchange Bias for Fe/Gd Multilayers," the American Physical Society March Meeting, Montreal, Quebec, Canada, Mar 2004.
74. "Coercivity and Thermal Stability of FePt Nanoparticles," the American Physical Society March Meeting, Austin, TX, Mar 2003.
75. "Exchanged coupled FePt Nanoparticle assembly," the American Physical Society March Meeting, Indianapolis, IN, Mar 2002.
76. "Coercivity and Activation Volume of Ni Nanowire Arrays," the American Physical Society March Meeting, Seattle, WA, Mar 2001.
77. "Magnetic Properties of Self-assembled Multilayered Fe/Pt Nanowire Arrays," the American Physical Society March Meeting, Minneapolis, MN, Mar 2000.

78. “Novel CoPtCr:C Nanocomposite Films for High Density Recording,” the American Physical Society March Meeting, Minneapolis, MN, Mar 2000.
79. “Magnetic Properties of Nano-scale self-assembled Co Arrays,” the American Physical Society March Meeting, Atlanta, GA, Mar 1999.
80. “Interfacial Magnetism and Intergrain Interaction in Co-alloy Films,” the American Physical Society March Meeting, Los Angeles, CA, Mar 1998.

## **PROFESSIONAL ACTIVITIES**

- Editorial board member, Chinese Physics B and Acta Physica Sinica, 2017-present
- Editor, Journal of Magnetism and Magnetic Materials, 2016-present.
- Symposium co-chair, Materials Research Society Spring meeting 2018; Conference chair, New York State Section of American Physical Society 2017 meeting; Program committee member, Intermag 2018, 2017, 2012; Co-organizer, American Physical Society March Meeting focus topic “Magnetic Nanostructures-Materials and Phenomena”, 2012; Conference co-chair, International workshop on Nanomagnetism and Spintronics, July 22-24, Linfen, China, 2010; Co-organizer, 1<sup>st</sup> Integrated Nanostructured Systems Workshop on Multifunctional Nanostructures, Buffalo, NY, May 2007.
- Session Chair, 62<sup>nd</sup> Annual Conference on Magnetism and Magnetic Materials; Session Chair, the first International Semiconductor Conference for Global Challenges, Nanjing, China, July 2017; Session Chair, 20th National Semiconductor Physics Conference, Linfen, China 2015; Session Chair, 56<sup>th</sup> Annual Conference on Magnetism and Magnetic Materials, Denver, 2013; Session Chair, Intermag 2012, Vancouver, 2012; Session chair, 56<sup>th</sup> Annual Conference on Magnetism and Magnetic Materials, Scottsdale, 2011; Session Chair, Intermag 2011, Taiwan, 2011; Session Chair, Summer School of Advanced Functional Materials, International Centre for Materials Physics, Chinese Academy of Sciences, Shenyang, China, July 2010; Session Chair, the 3rd International Conference on One-dimensional Nanomaterials, Atlanta, GA, Dec 2009; session Co-Chair, 48<sup>th</sup> Annual Conference on Magnetism and Magnetic Materials, 2003.
- Panelist for National Science Foundation, 2008, 2009, 2010, 2011, 2013, 2015, 2016.
- Proposal reviewer for Department of Energy, National Science Foundation, Astar (Singapore government); Foundation for Polish Science; Portuguese Foundation for Science and Technology.
- External dissertation reader, National University of Singapore.
- Review average ~15 papers per year for following journals: Nature, Nature Nanotechnology, Science Advances, Physical Review Letters, Applied Physics Letters, Physical Review B, Europhysics Letters, Journal of Magnetism and Magnetic Materials, IEEE Transactions on Magnetics, Journal of the American Chemical Society, ACS Nano, Nano Letters, Advanced Materials, Advanced Functional Materials, Small, Chemistry of Materials and Review of Scientific Instruments.