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## **EDUCATION**

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**Ph.D.**, Physics, December 1998, The Johns Hopkins University, Baltimore, Maryland

## **EXPERIENCE**

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Professor:	2008-present	U. C. Davis, Physics Department
Associate Professor:	2005-08	U. C. Davis, Physics Department
Assistant Professor:	2001-05	U. C. Davis, Physics Department
Postdoctoral Fellow:	1999-01	U. C. San Diego, Physics Department
Postdoctoral Fellow:	1999	The Johns Hopkins University Dept. of Physics & Astronomy & MRSEC

## **AWARDS**

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Chancellor's Fellowship, UC Davis, 2007-12  
Alfred P. Sloan Research Fellowship, 2005-07  
Junior Faculty Research Fellowship, UC Davis, 2003  
Chien-Shiung Wu & Luke Chia-Liu Yuan Scholarship, 1991

## **RESEARCH INTERESTS**

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Synthesis and experimental investigation of structural, electronic, magnetic, and transport properties of nanostructured materials. Topics include: intrinsic and extrinsic magnetoresistance, interlayer coupling, exchange bias, ballistic transport, half-metallics, spin-transfer torque, magnetization reversal and hysteresis, magnetic anisotropy, finite-size effects, superconductivity, thermoelectrics, solar cells, hydrogen storage. Expertise in advanced sputter deposition, e-beam evaporation, MBE, electrodeposition, pulsed-laser deposition, photo- and e-beam lithography, self-assembly nanolithography, x-ray diffraction, SQUID and vibrating sample magnetometry, alternating gradient magnetometry, scanning and transmission electron microscopy, atomic and magnetic force microscopy, photoemission electron microscopy, neutron scattering.

## **PROFESSIONAL ACTIVITY**

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Member, American Physical Society, Materials Research Society, American Vacuum Society, IEEE Magnetics Society, Neutron Scattering Society of America, SPIE  
77 refereed journal publications, 19 conference proceedings and other publications, 3 US patents  
Over 2,500 citations,  $h=26$   
Over 70 invited talks and 160 other conference presentations  
Featured in *Who's Who in America*, 2007- 2010 Editions  
Faculty mentor for NSF-REU, MURPPS  
Co-Chair, Program Committee, 2011 International Magnetics Conference, Taipei, Taiwan  
Co-Chair, Program Committee, 2007 Conference on Magnetism & Magnetic Materials, Tampa, FL  
(2,116 abstract submissions, 1,450 accepted)  
Local Chair & member, Program Committee, 2009 International Magnetics Conference, Sacramento, CA  
Member, Steering Committee, 2007 Conference on Magnetism & Magnetic Materials, Tampa, FL  
Member, Advisory Committee, Annual Conference on Magnetism & Magnetic Materials, 2007-10

Member, Program Committee, 2010 MMM – InterMag Joint Conference, Washington, DC  
 Member, Program Committee, 2007 MMM – InterMag Joint Conference, Baltimore, MD  
 Member, Program Committee, 2005 Conference on Magnetism & Magnetic Materials, San Jose, CA  
 Member, Executive Committee, American Vacuum Society – Magnetic Interfaces and Nanostructures Division, 2007-09  
 Co-Organizer, 2003 APS March Meeting DMP Focus Session on Asymmetric Nanoparticles  
 Co-Organizer, 2003 1<sup>st</sup> International Workshop on Magnetism, Hysteresis, and the FORC Method, Davis, CA  
 Member, Organizing Committee, 2008 Oxide Nanocomposites Symposium, ICCE-16, Kunming, China  
 Member, Organizing Committee, 2005 Oxide Nanocomposites Symposium, ICCE-12, Tenerife, Spain  
 Member, International Advisory Committee, 2008 International Conference on Ferrites (ICF10), Chengdu, China  
 Session Chair, 2003-07 APS March Meeting; 2002 APS California Section Spring Meeting; 2001-02, 07, 08 Conference on Magnetism & Magnetic Materials; 2003 Spring MRS Meeting; 2003 FORC Workshop; ICCE-10; ICCE-11; 2008 SPIE Meeting; 2009 InterMag; 2009 ICMAT.  
 Panelist and Reviewer for NSF, DoE  
 Reviewer for ACS, South Carolina – DEPCOR, Chinese Ministry of Education, Chinese Academy of Sciences  
 Reviewer for PRL, PRB, APL, Science, Nature, JACS, Small, Adv. Mater, Chem. Mater...

## **COURSES TAUGHT**

Physics 1B, *Principles of Physics*, lower division undergraduate, non-science majors.  
 Physics 9B, *Classical Physics*, lower division undergraduate, physics & engineering majors.  
 Physics 122, *Advanced Physics Laboratory*, upper division undergraduate.  
 Physics 250, *Fabrication and Properties of Magnetic Nanostructures*, graduate.  
 Physics 298, *Condensed Matter Journal Club*, graduate.

## **SELECTED GROUP RECOGNITIONS**

### **Graduate Student Advisees**

Randy Dumas    Leo Falicov Award, 2006 AVS for Best Graduate Student Research and Presentation;  
 2007 U. C. Davis Summer Graduate Student Researcher Award;  
 1<sup>st</sup> prize Margaret Burbidge Award, Best Experimental Research, 2005 APS-CA mtg;  
 Swedish Science Council Vetenskapsrådet Postdoctoral Fellowship (2010-12).  
 Joe Davies     National Research Council Postdoctoral Fellowship (2007-09);  
 2006 U. C. Davis Summer Graduate Student Researcher Award;  
 3<sup>rd</sup> prize Charles Kittle Award for Best Graphics, 2005 APS-CA meeting.  
 Justin Olamit    3<sup>rd</sup> prize Margaret Brubidge Award, Best Experimental Research, 2005 APS-CA mtg;  
 NEAT-IGERT Fellowship (2004);  
 Peter Greene    2009 U. C. Davis Summer Graduate Student Researcher Award;  
 2009 IEEE Magnetics Society Summer School.

### **Undergraduate Student Advisees**

Jared Wong     1<sup>st</sup> Prize Steven Chu Award for Best Undergraduate Research, 2006 APS-CA meeting.  
 Peter Greene    2<sup>nd</sup> Prize Steven Chu Award for Best Undergraduate Research, 2007 APS-CA meeting.  
 Nasim Eibagi    2008 APS-IBM Research Internship for Undergraduate Women;  
 2009 Undergraduate thesis with Highest Honor, U.C. Davis.

## **PUBLICATIONS**

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### **Referred Journal Publications**

1. John Q. Xiao, K. Liu, C. L. Chien, L. F. Schelp, and J. E. Schmidt, "Effects of Ar-ion implantation and annealing on structural and magnetic properties of Co/Pd multilayers", *Journal of Applied Physics* **76**, 6081 (1994).
2. K. Liu, K. Nagodawithana, P. C. Searson, and C. L. Chien, "Perpendicular giant magnetoresistance of multilayered Co/Cu nanowires", *Physical Review B* **51**, (Rapid Communications) 7381 (1995).
3. K. Liu, X. W. Wu, K. H. Ahn, T. Sulchek, C. L. Chien, and John Q. Xiao, "Charge ordering and magnetoresistance in  $\text{Nd}_{1-x}\text{Ca}_x\text{MnO}_3$  due to reduced double exchange", *Physical Review B* **54**, 3007 (1996).
4. K. H. Ahn, X. W. Wu, K. Liu, and C. L. Chien, "Magnetic properties and colossal magnetoresistance of  $\text{La}(\text{Ca})\text{MnO}_3$  materials doped with Fe", *Physical Review B* **54**, 15299 (1996).
5. K. H. Ahn, X. W. Wu, K. Liu, and C. L. Chien, "Effects of Fe doping in the colossal magnetoresistive  $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$ ", *Journal of Applied Physics* **81**, 5505 (1997).
6. K. Liu, X. W. Wu, K. H. Ahn, C. L. Chien, and John Q. Xiao, "Origin of colossal magnetoresistance in  $\text{Nd}_{1-x}\text{Ca}_x\text{MnO}_3$ ", *Journal of Chinese Electron Microscopy Society* **16** (4), 425 (1997).
7. Kai Liu, C. L. Chien, P. C. Searson, and Kui Yu-Zhang, "Giant positive magnetoresistance in arrays of semi-metallic bismuth nanowires", *IEEE Transactions on Magnetics*, **34**, 1093 (1998).
8. Kai Liu and C. L. Chien, "Magnetic and magneto-transport properties of novel nanostructured networks", *IEEE Transactions on Magnetics*, **34**, 1021 (1998).
9. Kai Liu, C. L. Chien, P. C. Searson, and Kui Yu-Zhang, "Structural and magneto-transport properties of electrodeposited bismuth nanowires", *Applied Physics Letters*, **73**, 1436 (1998).
10. S. M. Zhou, Kai Liu, and C. L. Chien, "Exchange coupling and macroscopic domain structure in a wedged permalloy/FeMn bilayer", *Physical Review B* **58**, (Rapid Communications) 14717 (1998).
11. Kai Liu, C. L. Chien, and P. C. Searson, "Finite size effect in Bi nanowires", *Physical Review B* **58**, (Rapid Communications) 14681 (1998).
12. T. Ambrose, Kai Liu, and C. L. Chien, "Doubly exchange-biased NiCoO/NiFe/Cu/NiFe/NiCoO spin valves", *Journal of Applied Physics* **85**, 6124 (1999).
13. J. W. Cai, Kai Liu, and C. L. Chien, "Exchange coupling in the paramagnetic state", *Physical Review B*, **60**, 72 (1999).
14. Kimin Hong, F. Y. Yang, Kai Liu, D. H. Reich, C. L. Chien, P. C. Searson, F. F. Balakirev, and G. S. Boebinger, "Giant positive magnetoresistance of Bi nanowire arrays in high magnetic fields", *Journal of Applied Physics* **85**, 6184 (1999).
15. Cai-Ming Liu, Zhi Yu, Ren-Gen Xiong, Kai Liu, and Xiao-Zeng You, "Crystal structure and novel magnetic of three-dimensional manganese (11)- $\mu$ -1, 3-Azido system", *Inorganic Chemistry Communications* **2**, 31 (1999).
16. Zhi Yu, Kai Liu, J. Q. Tao, Z. J. Zhong, Xiao-Zeng You, and G. G. Siu, "Rapid cooling and magnetic field induced cooperative effect for the metastable quintet state in a spin crossover complex", *Applied Physics Letters*, **74**, 4029 (1999).

17. F. Y. Yang, Kai Liu, C. L. Chien, and P. C. Searson, "Large magnetoresistance and finite-size effects in electrodeposited single-crystal Bi thin films", *Physical Review Letters* **82**, 3328 (1999).
18. H. S. Wang, Qi Li, Kai Liu, and C. L. Chien, "Low-field magnetoresistance anisotropy in ultrathin  $\text{Pr}_{0.67}\text{Sr}_{0.33}\text{MnO}_3$  films grown on different substrates", *Applied Physics Letters* **74**, 2212 (1999).
19. F. Y. Yang, Kai Liu, Kimin Hong, D. H. Reich, P. C. Searson, and C. L. Chien, "Large magnetoresistance of electrodeposited single-crystal bismuth thin films", *Science* **284**, 1335 (1999).
20. V. Nikitenko, V. Gornakov, A. Shapiro, R. Shull, Kai Liu, S. M. Zhou and C. L. Chien, "Asymmetry in elementary events of magnetization reversal in a ferromagnetic/antiferromagnetic bilayer", *Physical Review Letters* **84**, 765 (2000).
21. F. Y. Yang, Kai Liu, Kimin Hong, D. H. Reich, P. C. Searson, and C. L. Chien, "Shubnikov-de Haas oscillations in electrodeposited single-crystal bismuth thin films", *Physical Review B*, **61**, 6631 (2000).
22. Kai Liu, S. M. Zhou, C. L. Chien, V. Nikitenko, V. Gornakov, A. Shapiro, R. Shull, "Anisotropy-dependent macroscopic domain structure in wedged-Permalloy/Uniform-FeMn bilayers", *Journal of Applied Physics*, **87**, 5052 (2000).
23. C. L. Chien, F. Y. Yang, Kai Liu, D. H. Reich, and P. C. Searson, "Very large magnetoresistance in electrodeposited single-crystal Bi thin films", invited, *Journal of Applied Physics*, **87**, 4659 (2000).
24. S. M. Zhou, Kai Liu, and C. L. Chien, "Dependence of exchange coupling in permalloy/ $\text{Cr}_{82}\text{Al}_{18}$  bilayers on the constituent layer thickness", *Journal of Applied Physics*, **87**, 6659 (2000).
25. Kai Liu, S. M. Baker, M. Tuominen, T. P. Russell, and I. K. Schuller "Tailoring exchange bias with magnetic nanostructures", *Physical Review B* **63**, (Rapid Communications), 060403 (2001); also included in *Virtual Journal of Nanoscale Science & Technology*, **3** (6) (2001).
26. M. R. Fitzsimmons, C. Leighton, A. Hoffmann, P. C. Yashar, J. Nogués, Kai Liu, C. F. Majkrzak, J. A. Dura, H. Fritzsche, and I. K. Schuller, "Influence of interfacial disorder and temperature on magnetization reversal in exchange-coupled bilayers", *Physical Review B* **64**, 104415 (2001).
27. M. R. Fitzsimmons, C. Leighton, J. Nogués, A. Hoffmann, Kai Liu, I. K. Schuller, C. F. Majkrzak, J. A. Dura, J. R. Groves, R. W. Springer, P. N. Arendt, V. Leiner, and H. Lauter, "Influence of antiferromagnetic crystallinity on perpendicular exchange coupling and exchange bias", *Physical Review B* **65**, 134436 (2002).
28. M. S. Lund, W. A. A. Macedo, Kai Liu, J. Nogués, I. K. Schuller and C. Leighton, "Effect of antiferromagnet anisotropy on the critical thickness in exchange biased bilayers", *Physical Review B* **66**, 054422 (2002).
29. M.I. Montero, Kai Liu, O.M. Stoll, A. Hoffmann, I. K. Schuller, J. J. Åkerman, J.I. Martin, J.L. Vicent, S.M. Baker, T.P. Russell, C. Leighton and J. Nogués, "Nanostructures and the Proximity Effect", *Journal of Physics D: Applied Physics* **35**, 2398 (2002).
30. H. G. Katzgraber, F. Pázmándi, C. R. Pike, Kai Liu, R. T. Scalettar, K. L. Verosub, and G. T. Zimányi, "Reversal-field memory in the hysteresis of spin-glasses", *Physical Review Letters*, **89**, 257202 (2002).
31. Kai Liu, J. Nogués, C. Leighton, H. Masuda, K. Nishio, I. V. Roshchin and I. K. Schuller, "Fabrication and thermal stability of arrays of Fe nanodots", *Applied Physics Letters*, **81**, 4434 (2002); also included in *Virtual Journal of Nanoscale Science & Technology*, **6** (24) (2002).
32. J. I. Martín, J. Nogués, Kai Liu, J. L. Vicent, and I. K. Schuller, "Ordered magnetic nanostructures: fabrication and properties", topical review, *Journal of Magnetism and Magnetic Materials*, **256**, 449 (2003).

33. Kai Liu, L. M. Zhao, P. Klavins, F. Osterloh and H. Hiramatsu, “Extrinsic magnetoresistance in magnetite nanoparticles”, *Journal of Applied Physics*, **93**, 7951 (2003).
34. H. G. Katzgraber, F. Pázmándi, C. R. Pike, Kai Liu, R. T. Scalettar, K. L. Verosub, and G. T. Zimányi, “Reversal-field memory in magnetic hysteresis”, *Journal of Applied Physics*, **93**, 6617 (2003).
35. L. M. Zhao, P. Klavins, and Kai Liu, “Synthesis and properties of hole-doped  $\text{Li}_{1-x}\text{BC}$ ”, *Journal of Applied Physics*, **93**, 8653 (2003).
36. S. Cho, S. M. Kauzlarich, J. Olamit, Kai Liu, F. Grandjean, L. Rebbouh, and G. J. Long, “Characterization and magnetic properties of core/shell structured Fe/Au nanoparticles”, *Journal of Applied Physics*, **95**, 6804 (2004).
37. W. A. A. Macedo, B. Sahoo, V. E. Kuncser, J. Eisenmenger, I. Felner, J. Nogués, Kai Liu, W. Keune, and I. K. Schuller, “Changes in ferromagnet spin structure induced by exchange bias in Fe/MnF<sub>2</sub> films”, *Physical Review B*, **70**, 224414 (2004).
38. J. E. Davies, O. Hellwig, E. E. Fullerton, G. Denbeaux, J. B. Kortright and Kai Liu, “Magnetization reversal of Co/Pt multilayers: microscopic origin of high field magnetic irreversibility”, *Physical Review B*, **70**, 224434 (2004).
39. M. S. Pierce, C. R. Buechler, L. B. Sorensen, J. J. Turner, S. D. Kevan, E. A. Jagla, J. M. Deutsch, T. Mai, O. Narayan, J. E. Davies, K. Liu, J. Hunter Dunn, K. M. Chesnel, J. B. Kortright, O. Hellwig, and E. E. Fullerton, “Disorder-induced microscopic magnetic memory”, *Physical Review Letters*, **94**, 017202 (2005).
40. Y. M. Wang, A. M. Hodge, J. Biener, A. V. Hamza, D. Barnes, Kai Liu, and T. G. Nieh, “Deformation twinning during nanoindentation of nanocrystalline Ta”, *Applied Physics Letters*, **86**, 101915 (2005).
41. J. Y. Kim, F. E. Osterloh, H. Hiramatsu, R. K. Dumas, and Kai Liu, “Synthesis and real-time magnetic manipulation of a biaxial superparamagnetic colloid”, *Journal of Physical Chemistry B*, **109**, 11151-11157 (2005).
42. S. Cho, J. C. Idrobo, J. Olamit, Kai Liu, N. D. Browning, and S. M. Kauzlarich, “Growth mechanisms and oxidation-resistance of Au-coated Fe nanoparticles”, *Chemistry of Materials*, **17**, 3181-3186 (2005).
43. J. E. Davies, O. Hellwig, E. E. Fullerton, J. S. Jiang, S. D. Bader, G. T. Zimányi, and Kai Liu, “Anisotropy-dependence of irreversible switching in Fe/SmCo and FeNi/FePt spring magnet films”, *Applied Physics Letters*, **86**, 262503 (2005).
44. J. Olamit, E. Arenholz, Z. P. Li, O. Petravic, I. V. Roshchin, R. Morales, X. Batlle, I. K. Schuller, and Kai Liu, “Loop bifurcation and magnetization rotation in exchange biased Ni/FeF<sub>2</sub>”, *Physical Review B*, **72**, 012408-1-4 (2005).
45. S. M. Gravano, R. K. Dumas, Kai Liu, and T. E. Patten, “Methods for the surface functionalization of  $\gamma\text{-Fe}_2\text{O}_3$  nanoparticles with initiators for atom transfer radical polymerization and formation of core-shell inorganic-polymer structures”, *Journal of Polymer Science A*, **43**, 3675-3688 (2005).
46. E. Arenholz and Kai Liu, “Angular dependence of the magnetization reversal in exchange biased Fe/MnF<sub>2</sub>”, *Applied Physics Letters*, **87**, 132501-1-3 (2005).
47. F. E. Osterloh, H. Hiramatsu, R. K. Dumas, and Kai Liu, “Fe<sub>3</sub>O<sub>4</sub>-LiMo<sub>3</sub>Se<sub>3</sub> nanoparticle clusters as superparamagnetic nanocompasses”, *Langmuir*, **21**, 9709-9713 (2005).
48. J. E. Davies, J. Wu, C. Leighton, and Kai Liu, “Magnetization reversal and nanoscopic magnetic phase separation in  $\text{La}_{1-x}\text{Sr}_x\text{CoO}_3$ ”, *Physical Review B*, **72**, 134419-1-8 (2005).

49. M. C. Qian, C. Y. Fong, Kai Liu, W. E. Pickett, J. E. Pask, and L. H. Yang, “Half-metallic digital ferromagnetic heterostructure composed of a  $\delta$ -doped layer of Mn in Si”, *Physical Review Letters*, **96**, 027211-1-4 (2006).
50. J. Olamit, Z. P. Li, I. K. Schuller, and Kai Liu, “Angular dependence of exchange anisotropy on cooling field in FM/fluoride thin films”, *Physical Review B*, **73**, 024413-1-7 (2006).
51. S. Cho, A. M. Shahin, G. J. Long, J. E. Davies, Kai Liu, F. Grandjean, and S. M. Kauzlarich, “A magnetic and Mössbauer spectral study of core/shell structured Fe/Au nanoparticles”, *Chemistry of Materials*, **18**, 960-967 (2006).
52. E. Arenholz, Kai Liu, Z. P. Li, and I. K. Schuller, “Magnetization reversal of uncompensated Fe moments in exchange biased Ni/FeF<sub>2</sub> bilayers”, *Applied Physics Letters*, **88**, 072503-1-3 (2006).
53. Z. P. Li, O. Petravic, R. Morales, J. Olamit, X. Batlle, Kai Liu, and I. K. Schuller, “Origin of asymmetric reversal in exchange biased bilayers”, *Physical Review Letters*, **96**, 217205-1-4 (2006).
54. R. Morales, Z. P. Li, O. Petravic, X. Batlle, I. K. Schuller, J. Olamit, and Kai Liu, “Magnetization depth-dependence in exchange-biased thin films”, *Applied Physics Letters*, **89**, 072504-1-3 (2006).
55. B. Sahoo, W. A. A. Macedo, W. Keune, V. Kuncser, J. Eisenmenger, J. Nogués, I. K. Schuller, I. Felner, Kai Liu, and R. Röhlberger, “Mössbauer spectroscopical investigation of the exchange biased Fe/MnF<sub>2</sub> interface”, *Hyperfine Interactions*, **169**, 1371-1377 (2006).
56. J. Olamit, Kai Liu, Z. P. Li, and I. K. Schuller, “Irreversibility of magnetization rotation in exchange biased Fe/epitaxial-FeF<sub>2</sub> thin films”, *Applied Physics Letters*, **90**, 032510-1-3 (2007).
57. D. Dosev, M. Nickkova, R. K. Dumas, S. J. Gee, B. D. Hammock, Kai Liu, and I. M. Kennedy, “Magnetic/luminescent core/shell particles synthesized by spray pyrolysis and their application in immunoassays with internal standard”, *Nanotechnology*, **18**, 055102-1-6 (2007).
58. A. Lazicki, C.-S. Yoo, W. J. Evans, H. Cynn, W. E. Pickett, J. Olamit, Kai Liu, and Y. Ohishi, “Search for superconductivity in LiBC at high pressure”, *Physical Review B*, **75**, 054507-1-6 (2007).
59. J. Olamit and Kai Liu, “Rotational hysteresis of the exchange anisotropy direction in Co/FeMn thin films”, *Journal of Applied Physics*, **101**, 09E508-1-3 (2007).
60. M. S. Pierce, C. R. Buechler, L.B. Sorensen, S.D. Kevan, E.A. Jagla, J.M. Deutsch, T. Mai, O. Narayan, J. E. Davies, Kai Liu, G.T. Zimanyi, H. G. Katzberger, O. Hellwig, E. E. Fullerton, P. Fischer, and J. B. Kortright, “Disorder induced magnetic memory: Experiments and theories”, *Physical Review B*, **75**, 144406-1-23 (2007).
61. R. K. Dumas, C. P. Li, I. V. Roshchin, I. K. Schuller, and Kai Liu, “Magnetic fingerprints of sub-100 nm Fe nanodots”, *Physical Review B*, **75**, 134405-1-5 (2007) ; also included in *Virtual Journal of Nanoscale Science & Technology*, **15** (15) (2007).
62. R. K. Dumas, Kai Liu, C. P. Li, I. V. Roshchin, and I. K. Schuller, “Temperature Induced Single Domain - Vortex State Transition in sub-100nm Fe Nanodots”, *Applied Physics Letters*, **91**, 202501 (2007).
63. J. E. Davies, O. Hellwig, E. E. Fullerton, and Kai Liu, “Temperature Dependent Magnetization Reversal in (Co/Pt)/Ru Multilayers”, *Physical Review B*, **77**, 014421 (2008).
64. M. Winklhofer, R. K. Dumas, and Kai Liu, “Identifying reversible and irreversible magnetization changes in prototype patterned media using first- and second-order reversal curves”, *Journal of Applied Physics*, **103**, 07C518-1-3 (2008).
65. C. Y. Fong, M. C. Qian, Kai Liu, L. H. Yang, and J. E. Pask, “Design of Spintronic Materials with Simple Structures”, *Journal of Nanoscience and Nanotechnology*, **8**, 3652–3660 (2008).

66. Chunsheng Du, J. Yun, R. K. Dumas, X. Yuan, Kai Liu, N. D. Browning and Ning Pan, “Three-dimensionally Intercrossing Mn<sub>3</sub>O<sub>4</sub> Nanowires”, *Acta Materialia*, **56**, 3516-3522 (2008).
67. W.A.A. Macedo, B. Sahoo, J. Eisenmenger, M.D. Martins, W. Keune, V. Kuncser, R. Röhlsberger, O. Leupold, R. Rüffer, J. Nogués, Kai Liu, K. Schlage, and Ivan K. Schuller, “Direct measurement of depth-dependent Fe spin structure during magnetization reversal in Fe/MnF<sub>2</sub> exchange-coupled bilayers”, *Physical Review B*, **78**, 224401 (2008).
68. Jared Wong, Peter Greene, Randy K. Dumas, and Kai Liu, “Probing Magnetic Configurations in Co/Cu Multilayered Nanowires”, *Applied Physics Letters*, **94**, 032504 (2009).
69. M. Tofizur Rahman, Randy K. Dumas, Nasim Eibagi, Nazmun N Shams, Yun-Chung Wu, Kai Liu, and Chih-Huang Lai, “Controlling magnetization reversal in Co/Pt nanostructures with perpendicular anisotropy”, *Applied Physics Letters*, **94**, 042507 (2009).
70. R. Morales, Z-P. Li, J. Olamit, Kai Liu, J. M. Alameda, and I. K. Schuller, “Effect of the antiferromagnet bulk spin structure on exchange bias”, *Physical Review Letters*, **102**, 097201 (2009).
71. B. J. Kirby, S. M. Watson, J. E. Davies, G. T. Zimanyi, Kai Liu, R. D. Shull, and J. A. Borchers, “Direct Observation of Magnetic Gradient in in Co/Pd Pressure-Graded Media”, *Journal of Applied Physics*, **105**, 07C929 (2009).
72. Z. Ma, D. Dosev, M. Nichkova, R. K. Dumas, S. J. Gee, B. D. Hammock, Kai Liu and I. M. Kennedy, “Synthesis and characterization of multifunctional silica core–shell nanocomposites with magnetic and fluorescent functionalities”, *Journal of Magnetism and Magnetic Materials*, **321**, 1368–1371 (2009).
73. C. Leighton, D.D. Stauffer, Q. Huang, Y. Ren, B. Toby, S. El-Khatib, M.A. Torija, J. Wu, J.W. Lynn, L. Wang, N.A. Frey, H. Srikanth, J.E. Davies, Kai Liu and J.F. Mitchell, “Coupled structural / magnetocrystalline anisotropy transitions in the doped perovskite cobaltite Pr<sub>1-x</sub>Sr<sub>x</sub>CoO<sub>3</sub>”, *Physical Review B*, **79**, 214420 (2009).
74. J. E. Davies, O. Hellwig, E. E. Fullerton, M. Winklhofer, R. D. Shull, and Kai Liu, “Frustration Driven Stripe Domain Formation in Co/Pt Multilayer Films”, *Applied Physics Letters*, **95**, 022505 (2009).
75. M. Shaughnessy, C. Y. Fong, Ryan Snow, Kai Liu, J. E. Pask, and L. H. Yang, “Origin of large moments in Mn<sub>x</sub>Si<sub>1-x</sub> at small x”, *Applied Physics Letters*, **95**, 022515 (2009).
76. Randy K. Dumas, Thomas Gredig, Chang-Peng Li, Ivan K. Schuller and Kai Liu, “Angular dependence of vortex annihilation fields in asymmetric Co dots”, *Physical Review B*, **80**, 014416 (2009).
77. D. Perez de Lara, F. J. Castaño, B. G. Ng, R. K. Dumas, E. M. Gonzalez, Kai Liu, C. A. Ross, Ivan K. Schuller, and J. L. Vicent, “Rocking ratchet induced by pure magnetic potentials with broken reflection symmetry”, *Physical Review B*, in press.
78. J. W. Liao, R. K. Dumas, H. C. Hou, Y. C. Huang, W. C. Tsai, L. W. Wang, D. S. Wang, M. S. Lin, Y. C. Wu, R. Z. Chen, J. L. Lee, Kai Liu, and C. H. Lai, “Simultaneous enhancement of anisotropy and grain segregation in CoPtCr-SiO<sub>2</sub> perpendicular recording media by a MnRu intermediate layer”, submitted.
79. B. J. McMorran, A. C. Cochran, R. K. Dumas, Kai Liu, P. Morrow, D. T. Pierce, and J. Unguris, “Measuring the effects of low energy ion milling on the magnetization of Co/Pd multilayers using SEMPA”, submitted.
80. B. J. Kirby, J. E. Davies, Kai Liu, S. M. Watson, G. T. Zimanyi, R. D. Shull, P. A. Kienzle, and J. A. Borchers, “Vertically Graded Anisotropy in Co/Pd Multilayers”, submitted.

## PATENTS

- C. L. Chien, P. C. Searson, and Kai Liu, *Arrays of Semimetallic Bismuth Nanowires and Fabrication Techniques Thereof*, United States Patent No. 6,187,165, February 13, 2001.
- F. Y. Yang, Kai Liu, C. L. Chien, and P. C. Searson, *Bismuth Thin Films Structure and Methods of Construction*, United States Patent No. 6,358,392, March 19, 2002.
- Kai Liu, P. Klavins, and L. Zhao, *Synthesis of LiBC and hole-doped Li<sub>1-x</sub>BC*, United States Patent No. 7,144,562, December 5, 2006.

## OTHER PUBLICATIONS

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## **RECENT CONFERENCE INVITED TALKS**

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- “Manipulating Reversal Mechanisms of Thin Films with Perpendicular Anisotropy”, 2009 Advanced Light Source Users’ Meeting, Lawrence Berkeley National Laboratory, Berkeley, California, October 17, 2009.
- “Vortex State Reversal in Artificially Structured Nanomagnets”, International Conference on Materials for Advanced Technologies & Int’l Union of Materials Research Societies – International Conference in Asia (ICMAT 2009 & IUMRS-ICA 2009), Singapore, July 2, 2009.
- “Probing Magnetic Configurations in Buried Cobalt/Copper Multilayered Nanowires”, American Physical Society March Meeting, Pittsburgh, Pennsylvania, March 17, 2009.
- “Probing Magnetic Configurations in Buried Cobalt/Copper Multilayered Nanowires”, 2008 Materials Research Society Fall Meeting, Boston, Massachusetts, December 4, 2008.
- “Single Domain to Vortex State Transition in Multilayered Cobalt/Copper Nanowires”, Spintronics Symposium of the SPIE Optics & Photonics Conference, San Diego, California, August 13, 2008.
- “Fingerprinting magnetic nanostructures by first order reversal curves”, DCMP, American Physical Society March Meeting, Denver, Colorado, March 7, 2007.
- “Fingerprinting magnetization reversal in magnetic nanostructures”, Workshop on Nanomagnetism within LBNL-MSD – Opportunities for the Future, Lawrence Berkeley National Laboratory, Berkeley, California, January 19, 2007.
- “Magnetization reversal in magnetic nanostructures”, 2006 American Vacuum Society 53<sup>rd</sup> International Symposium & Exhibition, San Francisco, California, November 14, 2006.
- “Magnetic Fingerprints of Sub-100nm Fe Nanodots”, International Workshop on Nanomagnets by Self-organization, Eisenerz, Austria, October 9, 2006.
- “Fingerprinting magnetization reversal in magnetic nanostructures”, the 5<sup>th</sup> International Conference on Condensed Matter Theory and Materials Computation, Lanzhou, China, July 10, 2006.
- “First-order reversal curve studies of magnetization reversal in magnetic nanostructures”, plenary talk, The 2006 Taiwan Association for Magnetic Technology Annual Meeting, Taipei, Taiwan, June 28, 2006.
- “Fingerprinting magnetization reversal in magnetic nanostructures”, The 5<sup>th</sup> Joint Meeting of Chinese Physicists Worldwide (OCPA5), Taipei, Taiwan, June 27, 2006.
- “First-order reversal curve studies of magnetization reversal in prototype recording media”, 2006 IEEE International Magnetism Conference, San Diego, California, May 12, 2006.
- “Fingerprinting magnetization reversal in magnetic nanostructures”, 2006 Spring Materials Research Society Meeting, San Francisco, April 19, 2006.
- “Growth mechanisms and oxidation-resistance of gold-coated iron nanoparticles”, 2005 Materials Research Society Fall Meeting, Boston, Massachusetts, November 30, 2005.
- “Magnetization reversal in magnetic nanostructures”, 1<sup>st</sup> US-Spain Workshop on Nanoscale Materials, Segovia, Spain, September 21, 2005.
- “Multifunctional magnetic nanostructures for information technology and bio-science applications”, ChinaNANO 2005, China International Conference on Nanoscience and Technology, Beijing, China, June 9, 2005.