

M. H. (Minghu) Pan

R&D Staff
Scanning Probe Group
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Education

Hunan University, China	Applied Physics	B.A., 1996
Nanjing University, China	Physics	Ph.D., 2001

Professional Experience

2005–Present	R&D Staff member, Center for Nanophase Materials Science, Oak Ridge National Laboratory
2005	Postdoctoral Associate, Condensed Matter Sciences Division, Oak Ridge National Laboratory, University of Tennessee, Knoxville, TN
2004	Postdoctoral Associate, Department of Physics & Astronomy, University of Tennessee, Knoxville, TN
2001–2003	Postdoctoral Associate, State Key Laboratory of Surface Physics, Institute of Physics, Chinese Academy of Sciences, China

Professional and Synergistic Activities

2005–present	Member: American Physical Society
2006-present	Referee for <i>Physical Review Letter</i>

Honors and Awards

2002	The Best Poster Award in Asia-Pacific Surface & Interface Analysis Conference
2000	Huake Graduate Prize bestowed by Nanjing University
1999	Excellent Graduate Prize bestowed by Nanjing University

Publications (Over 30 articles in refereed journals), Full Publication List follows CV.

Research Synopsis

- Surface Molecule/Self-assembly.*
We use noble metal surface as the substrate, adsorb or deposit small molecules, through balancing the interactions between molecules and substrate, to fabricate various self-assembled nanostructures.
- Graphene Nanostructure.*
We use scanning tunneling microscopy/spectroscopy, to study atomic/electronic structures of graphene film, graphene nanoribbon and the edges of graphene with localized defects or distortions.
- Transition Metal Oxide, Surface Structure and Correlative Behaviors.*
We use scanning tunneling microscopy to study the surface and defect structures for Transition Metal Oxide (TMO) materials. By combined the DFT calculation, we are able to investigate the correlations between the surface, electronic structures and correlative properties.

Graduate and Postdoctoral Advisors:

Postdoctoral Associates:	Qing Li
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PUBLICATIONS

M. H. (Minghu) Pan, Ph.D.

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Peer-Reviewed Publications (Author of more than 30 articles in refereed journals):

1. Peter Maksymovych, **Minghu Pan**, Pu Yu, Ramamoorthy Ramesh, Arthur P Baddorf, Sergei V Kalinin, "Scaling and disorder analysis of local I-V curves from ferroelectric thin films of lead zirconate titanate", *Nanotechnology* 22(25), 254031(2011)
2. V. Meunier, **M.H. Pan**, F. Moreau, E.W. Plummer, "Evidence of Coulomb blockade behavior in a quasizero-dimensional quantum well on TiO₂ surface" *PNAS* 107, 14968(2010)
3. R. Jin, **M. H. Pan**, X. B. He , Guorong Li , De Li , Ru-wen Peng , J. R. Thompson, B. C. Sales, A. S. Sefat, M. A. McGuire, D Mandrus, J. F. Wendelken , V. Keppens and E. W. Plummer, "Electronic, magnetic and optical properties of two Fe-based superconductors and related parent compounds" *Supercond. Sci. Technol.* 23 054005(2010)
4. K.T. Park, V. Meunier, **M. Pan**, W.A. Shelton, N.-H. Yu, E.W. Plummer, "Nanoclusters of TiO₂ Wetted with Gold" *Surface Science* 603, 3131(2009).
5. V. B. Nascimento, Ang Li, Dilushan R. Jayasundara, Yi Xuan, Jared O'Neal, Shuheng Pan, T. Y. Chien, Biao Hu, X. B. He, Guorong Li, A. S. Sefat, M. A. McGuire, B. C. Sales, D. Mandrus, **M. H. Pan**, Jiandi Zhang, R. Jin, and E. W. Plummer, "Surface Geometric and Electronic Structures of BaFe₂As₂(001)" *Phys. Rev. Lett.* 103, 076104(2009)
6. K. T. Park, **M. H. Pan**, V. Meunier, and E. W. Plummer, "Reoxidation of TiO₂(110) via Ti interstitials and line defects," *Phys. Rev. B.* 75, 245415 (2007)
7. K. T. Park, **M. H. Pan**, V. Meunier, and E. W. Plummer, "Surface Reconstructions of TiO₂(110) Driven by Sub-Oxides" *Phys. Rev. Lett.* 96, 226105 (2006).
8. He K, **Pan M. H.**, Wang JZ, et al. "Growth and magnetism of self-organized Co nanoplatelets on Si(111) surface" *SURFACE AND INTERFACE ANALYSIS*, 38(6), 1028-1033 (2006)
9. Dou RF, Jia JF, Xu MH, et al. "Growth of single-domain monatomic In chain arrays on the vicinal Si(001) surface", *PHYSICA E-LOW-DIMENSIONAL SYSTEMS & NANOSTRUCTURES* 25(4), 660-667(2005)
10. **M. Pan**, H. Liu, J.-Z. Wang, J.-F. Jia, Q.-K. Xue, J.-L. Li, S. Qin, U. M. Mirsaidov, X. R. Wang, J. T. Markert, Z. Zhang, and C.-K. Shih, "Quantum Growth of Magnetic Nanoplatelets of Co on Si with High Blocking Temperature" *Nano. Lett.* 5, 87 (2005).
11. **M. Pan**, H. Ke, L. J. Zhang, J. F. Jia, and Q. K. Xue, "Structure and Magnetism of Ultrathin Co Film Grown on Pt(100)" *J. Vac. Sci. Technol. A*, 23, 790 (2005).
12. Xie T, Kimura A, Qiao S, et al. "X-ray magnetic circular dichroism at L-23 edge of Co nanoclusters on Si(111) surface", *JOURNAL OF PHYSICS-CONDENSED MATTER*, 16(48), S5783-S5786(2004)
13. Liu H, Zhang YF, Wang DY, et al. "Two-dimensional growth of Al films on Si(111)-7 x 7 at low-temperature" *SURFACE SCIENCE*, 571(1-3), 5-11(2004)

14. Xie T, Kimura A, Qiao S, et al. "Soft X-ray spectroscopy study of Mn nanoclusters on Si(111)-7x7 surface", *PHYSICA B-CONDENSED MATTER*, **351(3-4)**, 351-354(2004)
15. **M. Pan**, B. You, Y. Zhao, S. Wang, M. Lu, A. Hu, H. Zhai, and S. Zhou, "The Effect of Interfacial Coupling in Co/CoO Exchange-Bias Bilayers with Special Field Cooling" *Phys. Lett. A*, 313, 442 (2003).
16. Xue KH, Pan GP, **Pan M. H.**, et al. "Magnetic behaviour of arrays of nickel nanowires with small diameter", *SUPERLATTICES AND MICROSTRUCTURES*, 33(3), 119-129(2003)
17. Jiao J, **Pan M. H.**, Xue QK, et al. "Oxygen-induced migration of Ag nano-clusters on Si(111)-7 X 7 surface", *CHINESE JOURNAL OF CATALYSIS*, 24 (6), 433-436(2003)
18. You B, Wang YX, Zhao YL, et al. "Exchange bias in Co/Co₃O₄ bilayers", *JOURNAL OF APPLIED PHYSICS*, 93(10), 6587-6589(2003)
19. Jia JF, Liu X, Li SC, et al. "Artificial metal nanocluster crystals", *MODERN PHYSICS LETTERS B*, 16(23-24), 889-894(2002)
20. **M. Pan**, B. You, Y. Zhao, M. Lu, A. Hu, and H. Zhai, "Thermal Stability of Exchange Biasing in FeMn Based Bilayers" *J. Appl. Phys.*, 91, 5272 (2002).
21. **M. Pan** and Qi-Kun Xue, "Spin-Polarized Scanning Tunneling Microscopy and Spectroscopy," *Chin. Physics* 31, 800 (2002).
22. **M. Pan**, J. Chen, J. G. Long, L. N. Tong, M. Lu, J. Du, A. Hu, and H. R. Zhai, "A 90° Ferromagnetic Layers Coupling in FM/AFM/FM Structures" *J. Mag. Mag. Mater.* 226-230, 1817 (2001).
23. Zhai Y, Xu YX, Shi J, et al. "FMR study on patterned and unpatterned magnetic thin films" *JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS*, 226, 1567-1569(2001)
24. Tong LN, **Pan M. H.**, Long JG, et al., "Anisotropic magneto resistance of sputtered Ni₈₀Co₂₀/Fe multilayers", *JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS*, 226, 1749-1751 (2001)
25. Long JG, Zhai Y, Chen J, et al., "Magnetization property in Ta/NiFe/Ta sandwich structure" *JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS*, 226, 1823-1824(2001)
26. Xu QY, Ni G, **Pan M. H.**, et al. "The hall effect of Co_{0.35}Fe_{0.65}-Al₂O₃ nanogranular films" *JOURNAL OF PHYSICS-CONDENSED MATTER*, 13(9), 1851-1855(2001)
27. Du J, Chen J, Wu XS, et al., "Study on Ni₈₀Fe₂₀/Al₂O₃/Co magnetic tunnel junctions" *ACTA PHYSICA SINICA*, 48 (12), S236-S243(1999)
28. Tong LN, **Pan M. H.**, Wu XS, et al. "Transport properties of sputtered Fe Si multilayers" *JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS*, 199, 101-103(1999)
29. Tong LN, Du J, **Pan M. H.**, et al. "Magneto-optical, optical and GMR effect in Ni-Co/Cu multilayers" *JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS*, 199, 273-275(1999)
30. Tong LN, **Pan M. H.**, Du J, et al. "A study of interlayer coupling of Co Pb multilayers" *JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS*, 199, 437-439 (1999)
31. Wang H, Jin QY, Zhou SM, et al. "Large change of the giant magnetoresistance behavior after changing the spacer from Cu to CuMn alloy in Co/spacer/Co structures", *JOURNAL OF APPLIED PHYSICS*, 85(8), 5030-5032(1999)
32. Tong LN, He LQ, He XM, et al., "Oscillations of interlayer coupling and magneto-optical Kerr effect in NiCo/Cu multilayers", *JOURNAL OF APPLIED PHYSICS*, 84(11), 6250-6254(1998)

33. Tong LN, **Pan M. H.**, Wu J, et al., "Magnetic and transport properties of sputtered Fe/Si multilayers" *EUROPEAN PHYSICAL JOURNAL B*, 5(1), 61-66(1998)
34. Du J, Tong LN, Lu M, et al. "Concurrent variation of giant magnetoresistance and saturation Kerr relation in NiCo/Cu multilayers", *APPLIED PHYSICS LETTERS*, 72(25), 3371-3373(1998)
35. Du J, Wu J, Tong LN, et al. "Study on microstructural characterization and ferromagnetic resonance in sputtered Co/V multilayers", *PHYSICA STATUS SOLIDI A-APPLIED RESEARCH*, 167(1), 183-193(1998)