

## CURRICULUM VITAE

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**Degrees:**

6/2005 PHD. Astronomy in University of Wisconsin-Madison, USA

6/2002 M.Sc. Astronomy in University of Wisconsin-Madison, USA

7/1998 B.Sc. Astrophysics from Peking University

### Research Experience:

7/2009 - present Assistant Professor (tenure-track ), KIAA, Peking University

10/2008 - 01/2010 Arizona Prize Fellow, U Arizona

8/2005 - 10/2008 Postdoctoral Fellow, CITA, Toronto

9/2004 - 5/2005 Predoctoral Fellow, Dept. of Physics, Stanford University

7/2002, 6/2004 Visiting Student, Dept. of Physics, Stanford University

2000 - 2004 Ph.D. Student, Department of Astronomy, Univ. of Wisconsin, Madison

### Teaching Experience:

3/2013 - 5/2013 Graduate course: Frontiers of Astrophysics, PKU

2/2011 - 5/2011 Undergraduate course: Qualitative and Quantitative Physics, PKU

6/2010 - present Supervision of two graduates and a few undergraduates

3/2010 - 5/2010 Graduate course: Frontiers of Astrophysics, PKU

2008 Spring Graduate mini-course: "High Energy Astrophysics: Selected Topics", University of Toronto

5/2007 - 8/2007 Supervision of a summer student at CITA

2004 Spring TA for 100 Astronomy at the Department of Astronomy, University of Wisconsin-Madison

2001 Fall TA for 200 Astronomy at the Department of Astronomy, University of Wisconsin-Madison

1998 Fall TA for Electromagnetism at the Department of Geophysics, Peking University

### Current Research Interests:

Cosmic Ray Physics and MHD Turbulence and their implications in solar flares, space physics, SNRs, GRBs, dark matter, etc.

Plasma instabilities and their Astrophysical Implications

Atomic alignment and Astrophysical Magnetic Fields

Physics of Interstellar and Circumstellar Dust

**Recent Grants and Awards:**

2012	Winner of Templeton senior grant from Beyond the Horizons program
3/2012 - 6/2012	Visiting Professorship, International Institute of Physics, UFRN, Natal, Brazil
1/2012	Visiting Professorship, GCOE Program, Nagoya University, Japan
6/2011 - 7/2011	Visiting Professorship, Dept. of Physics, Ruhr University, Bochum
2010	<i>PI</i> at NSFC AST -11073004("Transport and Acceleration of Cosmic Rays in MHD turbulence and their implications")
2009	Bairen Fellowship, PKU
2008	Arizona Prize Fellowship
2008	Visiting Scholarship at ASIAA, Taipei
2008	Visiting Scholarship at MPA, Garching
2005	Postdoc Fellowship at CITA
2005	Visiting Scholarship at Ruhr University- Bochum
2004	Predocoral Fellowship at Stanford University

**Recent conference talks & school lectures:**

Feb 2013	Gamma Ray Bursts powered by turbulence & reconnection Invited talk at <i>Magnetic field in the Universe IV</i> , Cancun
Nov 2012	Ground state alignment and Probing magnetic field in diffuse medium Invited review talk at <i>APCTP Workshop on Astrophysics: Magnetic Fields in Astrophysics</i> , South Korea
Aug 2012	Cosmic ray transport in MHD turbulence Invited session talk at <i>IAU XXVIII General Assembly</i> , Beijing
July 2012	Gamma ray Bursts powered by turbulence and reconnection Invited session talk at <i>39th COSPAR General Assembly</i> , Mysore, India
June 2012	Cosmic Ray transport and acceleration in turbulence Invited lecturer at <i>2nd East-Asian School and Workshop on Lab, Space, Astro Plasma</i> , South Korea
Nov 2011	Cosmic Ray Transport and Gamma Ray Emission from SNRs, Invited talk at <i>6th Korean Astrophysics Workshop on Fundamental Process of Astrophysical Turbulence</i> in Pohang, South Korea
Aug 2011	Cosmic Ray transport and acceleration in turbulent magnetic field, Invited talk at <i>Magnetic field in the Universe III</i> in Zakopane, Poland
Aug 2011	Cosmic Ray transport in MHD turbulence: large and small scale interactions, Invited talk at <i>Plasma Physics session of OCPA7</i> in Kao Shiung, Taiwan
Jul 2011	Detecting Interstellar Magnetic fields through polarimetry, invited lecturer at <i>2nd summer school on Solar and Stellar Polarization</i> in Yibin, China
Jun 2011	Cosmic Ray Transport in MHD Turbulence: large and small scale interactions, Invited talk at <i>ASTRONUM-2011</i> in Valencia, Spain
Jun 2011	Nonlinear Cosmic Ray transport in MHD turbulence, Invited talk at <i>MHD and Kinetic Processes in Laboratory, Space and Astrophysical Plasmas (LSAP)</i> in Beijing
May 2011	Cosmic Ray transport in MHD turbulence, invited lecturer at summer school <i>LSAP</i> in Beijing

- Apr 2011 Transport and acceleration in MHD turbulence, Invited talk at workshop on *Multi-Messenger Astronomy of Cosmic Rays*, Beijing
- Feb 2011 Dynamics of energetic particles from solar flares to GRBs, invited talk at *Modern Trends in Theoretical Plasma Physics* in Bochum, Germany
- Sep 2010 Ground-state alignment: New diagnostics of astrophysical magnetic field, Invited review talk at *Special Detection Technique (Polarimetry) and Remote Sensing* in Kyiv, Ukraine
- Sep 2010 CR Transport through gyroresonance instability in compressible turbulence *274 IAU Symposium, Advances in Plasma Astrophysics*, Italy
- Aug 2010 Atomic Alignment- A New Diagnostics of Astrophysical Magnetic Field Invited talk at *10th International Colloquium on Atomic Spectra and Oscillator Strengths* at Berkeley, California
- Jun 2010 New magnetic diagnostics in diffuse medium Invited talk at *Cosmic magnetism From stellar to intergalactic scales*, Kiama, Australia
- Aug 2009 Atomic Alignment - A New Diagnostics of Magnetic Field in Diffuse Medium, Invited talk at IAU JD 15 *MAGNETIC FIELDS IN DIFFUSE MEDIA*, Rio de Janeiro
- Jul 2008 Ground State Alignment - A New Spectropolarimetric Diagnostics of Astrophysical Magnetic Field *Astronomical Polarimetry 2008*, Quebec City, Canada
- Jun 2008 New way of studying of magnetic field in diffuse astrophysical medium Invited talk at *Frontiers of Astronomy and Astrophysics* – an opening symposium of the KIAA-PKU, Beijing
- Mar 2008 Studies of magnetic field with aligned atoms Invited talk at *Turbulence and Dynamo*, Stockholm, Sweden
- Jan 2008 New technique of magnetic field studies using aligned atoms Invited talk at *Magnetic Fields in the Universe II: from Laboratory and Stars to the Primordial Universe*, Cozumel, Mexico
- Jun 2007 Cosmic ray transport in MHD turbulence Invited talk at *2nd International Conference on Numerical Modeling of Space Plasma Flows, ASTRONUM-2007*, Paris
- May 2007 Cosmic Ray Propagation in MHD Turbulence Invited session talk at *210 AAS meeting*, Hawaii
- Dec 2006 Atomic Alignment: Perspective Diagnostics for Circumstellar, ISM, QSO Magnetic fields XVIII Canary Winter school of Astrophysics *The Emission Line Universe*
- Jul 2006 Line polarization from aligned atoms as a disagnostics for ISM magnetic fields 16th Kingston Theoretical Astrophysics Meeting (KIK), Kingston, Canada

### Colloquia, Seminars within last 5 years:

2013 University of Costa Rica; 2013 University of Potsdam; 2013 DESY, Germany; 2012 Shandong University at Weihai; 2012 International Institute of Physics, Brazil; 2012 Nagoya University, Japan; 2011 Max Planck Institute of Radio Astronomy, Bonn; 2011 Ruhr U - Bochum; 2011, Yunnan Observatory 2011 U Utrecht; 2010 USTC, Hefei (\*); 2010 CFA, Harvard University;

2010 MIT MKI; 2009 U Sao Paulo; 2009 Dept of Physics, UC Irvine; 2009 LANL  
2009 UNLV, Nevada (\*); 2009 LPL, Arizona; 2008 U Montreal;  
2008 NAOC, Beijing; 2008 PMO, Nanjing; 2008 Nanjing University;  
2008 Shanghai Observatory; 2008 Hong Kong University; 2008 ASIAA, Taipei (\*);  
2008 Tsinghua University, Hsinchu; 2008 McMaster University;  
2008 U West Ontario; 2008 Ruhr University- Bochum; 2008 MPIK, Heidelberg;  
2008 MPA, Garching; 2007 U Alberta-Edmonton;

(\*) indicates the places where more than one colloquium were given

### **Service:**

2013 Aug Convener, session ST11 at AOGS Assembly, Brisbane, Australia  
2012 Aug Main convener, session ST27 at AOGS-AGU Joint Assembly, Singapore  
2011 June Co-organizer “MHD and Kinetic Processes in Laboratory, Space and  
Astrophysical Plasmas”, LSAP summer school and workshop, Beijing  
Refereeing: Astrophysical J, Physics of Plasma, Astrophysics and Space Science,  
Physics Letters, Advances in Space Research, Computer Physics Communications

### **Professional Affiliations:**

Membership of the American Astronomical Society  
Membership of the American Geophysical Union  
Membership of the Canadian Astronomical Society  
Membership of the Chinese Astronomical Society

**Collaborators:** Draine, B., Princeton; Evoli, C., Hamburg; Ferriere, K., Toulouse, France; Hirashita, H., ASIAA, Taipei; Inutsuka, S. Nagoya, Japan; Lazarian, A., Wisconsin; Lai, Shih-Ping, National Tsing Hua U, Taiwan; Marcowith, A., Montpellier; Petrosian, V., Stanford; Pohl, M., U Potsdam; Schlickeiser, R., Ruhr U, Bochum; Suzuki, T., Tokyo. Xiao, C., PKU, Beijing; Zhang, B., U Nevada

### **Additional information about my research can be obtained from:**

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## Publications

### Monograph

1. Yan, Huirong & Lazarian, A., 2012, “MHD turbulence: Consequences of and Techniques for Studies”, Lambert Academic Publishing (234 Pages)

### Refereed publications (total citations > 860)

2. Yan, H. 2013, “Cosmic Ray transport in turbulent magnetic field”, chapter in Lecture Notes in Physics “Magnetic Fields in Diffuse media”
3. Shangguan, J. & Yan, Huirong 2013, “Study of Interplanetary Magnetic Field with Atomic Alignment”, *Ap&SS*, 343,335
4. Lazarian, A.; Vlahos, L.; Kowal, G.; Yan, H.; Beresnyak, A.; de Gouveia Dal Pino, E. M. 2012, “Turbulence, Magnetic Reconnection in Turbulent Fluids and Energetic Particle Acceleration”, *Space Science Review*, 153, 557
5. Yan, Huirong & Lazarian, A. 2012, “Tracing Magnetic Fields with Ground State Alignment”, invited review, *JQSRT*, 113,1409
6. Yan, Huirong, Lazarian, A., & R. Schlickeiser 2012, “Cosmic Ray Streaming from SNRs and Gamma Ray Emission from Nearby molecular clouds”, *ApJ*, 745, 140
7. Yan, Huirong & Lazarian, A., 2011, “Cosmic Ray transport through gyroresonance instability in compressible turbulence”, *ApJ*, 731, 35
8. Zhang, B. & Yan, Huirong 2011, “ The Internal-Collision-Induced Magnetic Reconnection and Turbulence (ICMART) Model of Gamma-Ray Bursts”, *ApJ*, 726, 90
9. Beresnyak, A., H. Yan, & Lazarian, A., 2011, “Numerical Study of Cosmic Ray Diffusion in MHD Turbulence”, *ApJ*, 728, 60
10. Hiroyuki Hirashita, Takaya Nozawa, Huirong Yan, Takashi Kozasa, 2010, “Effects of grain shattering by turbulence on extinction curves in starburst galaxies”, *MNRAS*, 404, 1473
11. Yan, Huirong, 2009 “Nonresonant Grain Acceleration in MHD Turbulence”, *MNRAS*, 397, 1093
12. Hirashita, Hiroyuki; Yan, Huirong, 2009, “Shattering and coagulation of dust grains in interstellar turbulence”, *MNRAS*, 394,1061

13. Lazarian, A.; Beresnyak, A.; Yan, H.; Opher, M.; Liu, Y., 2009, "Properties and Selected Implications of Magnetic Turbulence for Interstellar Medium, Local Bubble and Solar Wind ", *Space Science Review*, 143, 387
14. Yan, Huirong & Lazarian, A., 2008, "Cosmic Ray Propagation: Nonlinear Diffusion Parallel and Perpendicular to Mean Magnetic Field", *ApJ*, 673, p.942-953
15. Yan, Huirong, Lazarian, A., & Petrosian, V., 2008, "Particle acceleration by fast modes in Solar flares", *ApJ*, 684, p.1461-1468
16. Yan, Huirong, Lazarian, A., 2008, "Atomic Alignment and Diagnostics of Magnetic Fields in Diffuse Media", *ApJ*, 677, p.1401-1424
17. Yan, Huirong & Lazarian, A., 2007, "Cosmic ray transport in MHD turbulence", *ASP Conf Ser.*, 385, 56, in *Numerical Modeling of Space Plasma Flows*
18. Yan, Huirong & Lazarian, A., 2007, "Polarization from aligned atoms as a diagnostics of circumstellar, AGN and interstellar magnetic fields: II. Atoms with Hyperfine Structure", *ApJ*, 657, p.618-640
19. Yan, Huirong & Lazarian, A., 2006, "Polarization of absorption lines as a diagnostics of circumstellar, interstellar and intergalactic magnetic fields: Fine structure atoms", *ApJ*, 653, p.1292-1313
20. Vahe Petrosian, Huirong Yan, A. Lazarian 2006, "Damping of MHD turbulence in Solar Flares", *ApJ*, 644, p.603-612
21. Suzuki, T. K.; Yan, H.; Lazarian, A.; Cassinelli, J. P. 2006, "Collisionless Damping of Fast Magnetohydrodynamic Waves in Magnetorotational Winds", *ApJ*, 640, p.1005-1017
22. Lazarian, A., & Yan, Huirong 2005, "Statistics of turbulence via polarimetry: alignment of grains and atoms", in *MAGNETIC FIELDS IN THE UNIVERSE: From Laboratory and Stars to Primordial Structures*, AIP, 784, p.495-505
23. Pohl, M., Yan, H., Lazarian, A. 2005, "Magnetically Limited X-Ray Filaments in Young Supernova Remnants", *ApJ*, 626, 101L
24. Shalchi, A., Yan, H., Lazarian, A. 2005, "Spurious Contribution to CR scattering calculations", *MNRAS*, 356, p.1064-1070
25. Yan, Huirong & Lazarian, A. 2004, "Cosmic Rays Scattering and Streaming in Compressible

- Magnetohydrodynamic Turbulence”, *ApJ*, 614, p.757-769
26. Yan, Huirong, Lazarian, A., & Draine, B T. 2004, “Grain Dynamics in Magnetized Compressible Inter-stellar Medium”, *ApJ*, 616, p.895-911
  27. Lazarian, A. & Yan, Huirong 2004, “Translational and Rotational Dynamics of Dust”, (20 pages), in *Astrophysics of Dust*, eds. Adolf N. Witt, Geoffrey C. Clayton, Bruce T. Draine, ASP, 309, 479
  28. Lazarian, A., Petrosian, Vahe, Yan, Huirong, & Cho, Jungyeon 2003, “Physics of Gamma-Ray Bursts: Turbulence, Energy Transfer and Reconnection”, in *Beaming and Jets in Gamma Ray Bursts*, eds R. Ouyed, Jungyeon Hjorth and A. Nordlund, (18 pages), astro-ph/0301181
  29. Lazarian, A., Cho, Jungyeon, & Yan, Huirong 2003, “The Properties of Compressible MHD and Cosmic Ray Transport”, *Recent Research Developments in Astrophysics series*, (Research Signpost, 20 pages), astro-ph/0211031
  30. Yan, Huirong & Lazarian, A. 2003, “Grain Acceleration by MHD Turbulence: Gyroresonance Mechanism”, *ApJ*, 592, L33-L37
  31. Yan, Huirong & Lazarian, A. 2002, “Scattering of Cosmic Rays by Magnetohydrodynamic Turbulence”, *Phys. Rev. Lett.*, 89, 28, 1102-(1-4)
  32. Lazarian, A., & Yan, Huirong 2002, “Grain Dynamics in Magnetized Interstellar Gas”, *ApJ.*, 566, L105-L108
  33. Cho, Jungyeon, Lazarian, A., & Yan, Huirong 2002, “Scaling of MHD Turbulence: Implications for HI”, *ASP*, eds Russ Taylor, Tom Landecker, and Tony Willis, 276, 170
  34. H. Yan , & X. Mao 2001, “Generation of High Speed Particles in Herbig-Haro Flow Regions”, *Chinese Phys. Lett.* 18 307

### **Conference Proceedings**

35. Lazarian, A. & Yan, Huirong, 2012, “Magnetic reconnection in turbulent plasmas and gamma ray bursts”, 5th International Meeting on High Energy Gamma-Ray Astronomy, *AIP Conf Proc*, 1505, 101
36. Yan, Huirong & Lazarian, A., 2011, “Cosmic Ray transport in MHD turbulence: large and small scale interactions”, *ASTRONUM 2011*, ASP conference Ser. 459, 40
37. Yan, Huirong & Lazarian, A., 2011, *Astronomical Polarimetry 2008*, Eds. P. Bastien, N. Manset, D. P. Clemens, and N. St-Louis. ASP Conference Series, Vol. 449. San Francisco: Astronomical Society of the Pacific, 2012., p.139
38. Yan, Huirong & Lazarian, A. 2009, “Ground-state alignment of atoms and ions: New Diagnos-



tics of Astrophysical Magnetic field in diffuse medium”, in *Magnetic Fields In The Universe II*, RevMexAA, 36, 97

39. Yan, Huirong 2006, “Damping of fast modes of MHD turbulence and electron acceleration in Solar Flares”, *ENERGY BUDGET IN THE HIGH ENERGY UNIVERSE, Proceedings of the International Workshop Kashiwa, Japan 22 - 24 February 2006*
40. Yan, Huirong & Lazarian, A. 2004, “Optical polarization from aligned atoms as a new diagnostic of Astrophysical magnetic fields”, Polarimetry Symposium 2004, Hawaii, USA

**Papers submitted and drafted**

41. Zhang, H. & Yan, H. 2012, “Magnetic field detection in general diffuse medium: atomic alignment without a pumping source”, in preparation
42. Xu, S. & Yan, H. 2012, “numerically study of cosmic ray transport in turbulent magnetic field”, in preparation