Asif ud-Doula

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Education

- **B.S.** Physics and Mathematics, City College of New York, 1996.
- **Ph.D.** Physics, Department of Physics and Astronomy, Univ. of Delaware, Newark, DE. Title: "The Effects of Magnetic Fields and Rotation on Line-Driven Hot Star Winds"; Advisor: Prof. Stan Owocki, 2003 .

Teaching Experience

- **Assistant Professor** (tenure-track), Department of Physics, Penn State Worhthington Scranton. 2010-present
- **Assistant Professor** (tenure-track), Department of Physics, Morrisville State College, Morrisville, NY. Designed and taught undergraduate physics and astronomy courses along with labs. Jan 2008-2010.
  - **Phys 157** Univ Physics I: A calculus-based introduction to mechanics.
  - **Phys 267** Univ Physics III: A calculus-based introduction to electricity and magnetism.
  - **Phys 268** Univ Physics IV: A calculus-based introduction to optics and modern physics.
  - **Phys 127** General Physics I: An algebra-based introduction to mechanics.
  - **Phys 128** General Physics II: An algebra-based introduction to thermodynamics, optics and electromagnetism.
  - **Astr 101** Solar Astronomy: an introduction to astronomy with an emphasis on solar system.
  - **Astr 110** Stellar Astronomy: an introduction to astronomy with an emphasis on stellar evolution.
- **Instructor**, Department of Physics and Astronomy, Widener University. Designed and taught Introductory Astronomy course to Advanced Placement high school students using lectures and web-based tool WebCT. Spring 2007.
- **Instructor**, Department of Physics and Astronomy, University of Delaware. Designed and taught an introductory undergraduate physics course with 120 mostly nursing students; managed 10 TAs assigned to help out with the course. Winter 2006.
- **Teaching Assistant**, Department of Physics and Astronomy, University of Delaware. Taught recitation sessions for introductory physics I and II; graded homework and exams; 1998-2000.
- **Graduate Assistant**, Department of Physics and Space Sciences, Florida Institute of Technology. Taught a full credit laboratory course on introductory undergraduate physics; 1997-1998.
- **Teaching Assistant**, Department of Physics, Oklahoma State University. Taught recitation sessions for introductory physics I and II; graded homework and exams; 1996-1997.
- **Math Mentor**, Tutorial Center, The City College of New York. Assisted undergraduate students in understanding introductory mathematics up to calculus III; 1995-1996.

Research Experience

- **Post-Doctoral Research Associate**, Bartol Research Institute, University of Delaware. Studied the effects of magnetic field on the dynamics of hot-star winds; analyzed the Chandra data to explain X-ray emissions from massive stars; 2005-2008.
- **Post-Doctoral Research Associate**, Department of Physics, Swarthmore College. Studied and analyzed x-ray emission from massive stars; 2005-2007.
- **Post-Doctoral Research Associate**, Department of Physics, North Carolina State University. Studied the effects of magnetic field on the dynamics of core collapse supernovae; 2002-2005.
- **NASA Space Grant College Graduate Fellow**, Bartol Research Institute, Newark, DE. Thesis with Prof. Stanley Owocki, "The Effects of Magnetic Fields and Rotation on Line-driven Hot-star Winds"; 2001-2002.
- **Research Assistant**, Bartol Research Institute, Newark, DE 19716, supervisor: Prof. S. Owocki. Analyzed the effects of magnetic fields and rotation on line-driven winds; 2000-2001.
- **Research Assistant**, supervisor: Prof. Marilyn Gunner, The City College of New York. Developed codes to analyze protein structures; 1994-1996.
- **Research Assistant**, supervisor: Prof. Michael Lubell, The City College of New York. Developed codes to perform preliminary calculations to design an electron gun for the purpose of transporting lithium ion beam; 1994-1995.
- **Research Assistant**, supervisor: Prof. Joel Koplik, Levich Institute of The City College of New York. Designed and ran codes to solve convection diffusion equations in one dimension; 1993-1994.

Grants Awarded

- Co-Investigator on NASA's Long Term Space Astrophysics (LTSA) program, "Magnetically-Controlled Circumstellar Environments of Hot Stars: a Multi-Wavelength Confrontation between Observations and Models", PI: Dr. Richard Townsend. ($737,000).
- Co-Investigator on Chandra Cycle 8, "Dynamical Simulation of Magnetic Channeling and Reconnection for Hot-Star X-ray Emission", PI: Prof Stan Owocki. ($105,000).
- Co-Investigator on Chandra Cycle 6 , "MHD Simulation of Magnetically Confined Wind Shock (MCWS) Model for Hot Star X-ray Emission", PI: Prof Stan Owocki. ($95,000).
- Co-Investigator on Chandra observation (03200677), "Phase-Resolved Spectroscopy of Theta-1 Orionis C (O7 V)", PI: Prof. Marc Gagnè. ($81,342).
- Co-Investigator on Chandra Archive Proposal, "Doppler-broadened grating spectra of hot stars", PI: Prof David Cohen. ($78,923).
- Co-Investigator on Chandra observation (03200773), "High Resolution X-Ray Spectroscopy of β Crucis: a Nearby Hot Star with a High X-Ray Count", PI: Prof. David Cohen. ($64,890).
- Co-Investigator on XMM-Newton proposal "Probing the magnetic confinement of the winds of Oe stars" (ID 055444); PI: Yaël Nazè. ($26,400).
- Co-Investigator on Suzaku Guest Observer Program , "X-rays from Magnetically Confined Hot Plasma in Tau Sco"; PI: Rico Ignace ($18,750).

- Co-Investigator on Chandra Cycle 8 Education and Public Outreach (E&PO) proposal (0084B06): "Using Simple Ball and Stick Models to Explain Stellar Size Scales and Magnetic Fields in Vocational High Schools"; PI: Prof. Stan Owocki ($15,000).
- **Individual Career Development Award** for conducting research, Morrisville State College, ($700).
- NASA/DSGC Graduate Fellowship: Elected Fellow (2001-2002).

Computer Skills

- Programming Languages: Fortran, IDL.
- Platforms: AIX, Unix, IRIX, Solaris, Linux, Windows NT/XP.
- Hydrodynamic Codes: ZEUS-3D, ZEUS-MP, VH1, AMRVAC.

Personal Information

- Citizenship: US
- Countries of Long-term Residence: US, Senegal, Poland, Bangladesh.
- Hobbies: table tennis, tennis, soccer, traveling, cooking.

Languages

- Fluent: English, Bengali, Polish
- Fair: French, Russian.

Invited Seminars

- "Large Structures in Massive Star Winds", University of Liege, Belgium, May 2009.
- "Magnetically Channeled Winds & Decretion Disks in Hot, Massive Stars", Catholic University of Leuven, Belgium, June, 2009.
- "Spindown of Massive Stars", University of Nice, France, June, 2009.
- "Line-Driven Winds", State University of California at Northridge, CA, March, 2008.
- "The Effects of Magnetic Fields on Line-Driven Winds", University of Montreal, Montreal, Canada, May, 2006.
- "Centrifugal Breakout of Magnetically Confined Line-Driven Stellar Winds", Princeton University, Princeton, NJ, April, 2006
- "The Effects of Magnetic Fields and Rotation on Massive Star Winds", NASA Goddard Space Flight Center, Greenbelt, MD, Oct, 2002.
- "The Effects of Magnetic Fields and Rotation on Massive Star Winds", North Carolina State University, Raleigh, NC, Feb, 2002.

Publications

Journal Articles

1. Nazé, Y., ud-Doula, A., Spano, M., Rauw, G., De Becker, M. and Walborn, N. R, "New findings on the prototypical Of?p stars", A&A, 2010, *in press* .
2. Townsend, R. H. D., Oksala, M. E., Cohen, D. H., Owocki, S. P. and ud-Doula, A., "Discovery of Rotational Braking in the Magnetic Helium-strong Star Sigma Orionis E", Astrophysical Journal Letters, 2010.
3. Nazé, Y, Rauw, G. and ud-Doula, A,"Hot and cool: two emission-line stars with contrasting behaviours in the same XMM-Newton field ", A&A, 2010.
4. Nazé, Y, Rauw, G. and ud-Doula, A, "Hot and cool: two emission-line stars with constrasting behaviours in the same XMM-Newton field", A&A, 2009, *in press*.
5. ud-Doula, A., Owocki, S. and Townsend, R.H.D, "Dynamical Simulations of Magnetically Channeled Line-Driven Stellar Winds: III. Angular Momentum Loss and Stellar Spindown", Monthly Notices of RAS, 2009.
6. ud-Doula, A., Owocki, S. and Townsend, R.H.D, "Dynamical Simulations of Magnetically Channeled Line-Driven Stellar Winds: II.The Effects of Field-Aligned Rotation", Monthly Notices of RAS, 2008, 385, 97.
7. Townsend, R.H.D, Owocki, S. and ud-Doula, A., "A Rigid-Field Hydrodynamics approach to modeling the magnetospheres of massive stars", Monthly Notices of RAS, 2007, Vol 382.
8. Owocki, S., Townsend, R. and ud-Doula, A., "Modeling the Magnetospheres of Luminous Stars: Interactions Between Supersonic Radiation-Driven Winds and Stellar Magnetic Fields", Physics of Plasmas, 2007, Vol.14, No.5
9. ud-Doula, A., Townsend, R. and Owocki, S., 2006, "Centrifugal Breakout of Magnetically Confined Line-Driven Stellar Winds", ApJL, 2006.
10. Hayes, J., Norman, M., Bordner, M., Li, P., Fiedler, R., Clark, S., ud-Doula, A., and MacLow, M., "Simulating Radiating and Magnetized Flows in Multi-Dimensions with ZEUS-MP", ApJS, 2006.
11. Gagné, M., Oksala, M., Cohen, D., Tonnesen, S., ud-Doula, A., Owocki, S., Townsend, R., and MacFarlane, J., "Chandra HETGS Multi-phase Spectroscopy of the Young Magnetic O Star θ^1 Ori C", ApJ, 2005.
12. Owocki, S. and ud-Doula, A., 2004, "The Effect of Magnetic Field Tilt and Divergence on the Mass Flux and Flow Speed in a Line-Driven Stellar Wind", 2004, ApJ.
13. Kramer,R.H., Tonnesen,S.K., Cohen, D.H., Owocki, S.P., ud-Doula, A., MacFarlane, J.J., "X-ray emission line profile modeling of hot stars", 2003, Review of Scientific Instruments, 74, 1966.
14. ud-Doula, A. and Owocki, S., 2002, "Dynamical Simulations of Magnetically Channeled Line-Driven Stellar Winds: I. Isothermal, Nonrotating, Radially Driven Flow", ApJ, 576, 2002.
15. Gunner, M. R.; Saleh, M. A.; Cross, E.; ud-Doula, A. and Wise, M., "Backbone Dipoles Generate Positive Potentials in all Proteins: Origins and Implications of the Effect", Biophys J., 2000, 78, 3.

Selected Conference Proceedings

16. ud-Doula, A., "Hydrodynamic Wind Theory", Invited Talk, Interferometric View of Hot Stars, Vina del Mar, Chile, 2009.

17. ud-Doula, A., Owocki, S.P. and Townsend, R.H.D, "Angular Momentum Loss and Stellar Spindown in Magnetic Massive Stars", Cosmic Magnetic Fields: from Planets, to Stars and Galaxies, Tenerife, Spain, 2008.

18. ud-Doula, A., "Large-scale wind structure due to magnetic fields", Clumping in Hot Star Winds conference, W.-R. Hamann, A. Feldmeier & L. Oskinova, eds., Potsdam, 2007.

19. Schnerr, R.S., Henrichs, H.F., Owocki, S.P., ud-Doula, A., & Townsend, R.H.D., "Magnetic Fields and UV-line Variability in Beta Cephei", Active OB-Stars: Laboratories for Stellar and Circumstellar Physics, 2007.

20. Bjorkman, J.E., and ud-Doula, A., "Discussion Session 3: Mass Loss as Origin of Circumstellar Material", Active OB-Stars: Laboratories for Stellar and Circumstellar Physics, 2007.

21. Cohen, D.H., Leutenegger, M.A., ud-Doula, A., & Owocki, S.P., "Quantitative Analysis of Resolved X-ray Emission Line Profiles of O Stars", Bulletin of the American Astronomical Society, 2006.

22. St.Vincent, S., Cohen, D.H., ud-Doula, A., Townsend, R.H., & Owocki, S.P., "Synthesis of Observables from Numerical Simulations of Magnetized Hot-Star Winds" Bulletin of the American Astronomical Society, 2006.

23. ud-Doula, A., & Blondin, J., "The Effects of Rotation on Spherical Accretion Shock Instability", Bulletin of the American Astronomical Society, 2005.

24. ud-Doula, A., Townsend, R. and Owocki, S., "Centrifugal Breakout of Magnetically Confined Line-Driven Stellar Winds", Hot Star Disks Proceedings, ASP Conference Series, R. Ignace and K. Gayley, eds., 2004.

25. Baade, D. and ud-Doula, A., "Magnetically and Rotationally Challenged Disks: One Model Fits All?", Hot Star Disks Proceedings, ASP Conference Series, R. Ignace and K. Gayley, eds., 2004.

26. Oksala, M., Gagne, M., Cohen, D., Tonnesen, S., ud-Doula, A., Owocki, S., & MacFarlane, J. 2004, Bulletin of the American Astronomical Society, 36, 774

27. ud-Doula, A. and Owocki, S., "The Effects of Magnetic Fields on Line-Driven Stellar Winds", International Conference on magnetic Fields in O, B and A stars ASP Conference Series, Vol. No.216, 2003 L.A. Balona, H. Henrichs & T. Medupe, eds., 2003.

28. Owocki, S. and ud-Doula, A., "Magnetic Spin-Up of Line-Driven Stellar Winds", International Conference on magnetic Fields in O, B and A stars ASP Conference Series, Vol. No.216, 2003 L.A. Balona, H. Henrichs & T. Medupe, eds., 2003.

29. ud-Doula, A., & Blondin, J., "The Magneto-Rotational Instability in Standing Accretion Shocks", Bulletin of the American Astronomical Society, 2003.

30. ud-Doula, A., and Owocki, S., "The Effects of Field-Aligned Rotation on the Magnetically Channeled Line-Driven Winds", Stellar Rotation Proceedings IAU Symposium No. 215, Andre Maeder & Philippe Eenens, eds., 2002.

31. Tonnesen, S. K., Cohen, D. H., Owocki, S. P., ud-Doula, A., Gagne, M., & Oksala, M. 2002, Bulletin of the American Astronomical Society, 34, 1284

32. ud-Doula, A. and Owocki, S., "Numerical Simulations of Magnetically Confined Line Driven Winds", Bulletin of the American Astronomical Society, 2001.

33. de Messieres, G. E., Cardamone, C., Cohen, D. H., MacFarlane, J. J., Owocki, S. P., ud-Doula, A., "Chandra Emission Line Diagnostics of the Unusual Hot Star tau Scorpii", Bulletin of the American Astronomical Society, 2001.

34. Gagne, M., Cohen, D., Owocki, S. and ud-Doula, A., "Mass Loss and Magnetospheres: X-rays from Hot Stars and Young Stellar Objects", The X-ray Universe at Sharp Focus, eds. S. Vrtilek, E. Schlegel and L. Kuhi, ASP Conference Series 2001.

References

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