

## Objectives

(1) To facilitate and engage in a vibrant research program of theoretical astrophysics and plasma physics, directed toward understanding underlying physical principles. (2) To apply the problem solving skills and approach of theoretical astrophysics to occasional interdisciplinary endeavors. (3) To minimize administrative minutia.

## Faculty Positions

Department of Physics & Astronomy, and Laboratory for Laser Energetics,  
University of Rochester, Rochester, NY, USA:

June 2004-	Professor of Physics and Astronomy
Nov 2003-June 2004	Associate Professor of Physics and Astronomy (with tenure)
Jan 2000- Nov 2003	Assistant Professor of Physics and Astronomy

## Research Fellowship Positions

1998-1999     Scholar in Physics (Theoretical Astrophysics),  
Division of Physics, Mathematics, and Astronomy  
California Institute of Technology, Pasadena, CA, USA

1995-1998     Research Fellow, Institute of Astronomy  
Cambridge University  
Cambridge, UK

June 1995-Aug 1995     Summer Research Fellow  
Harvard-Smithsonian Center for Astrophysics,  
Cambridge, MA

## Education

Harvard University     Ph.D. in theoretical astrophysics, June 1995.  
Sept. 1991-June 1995     A.M., June 1993

Cambridge University     C.A.S.M. with honours (Math. Tripos, Part III),  
Sept. 1990-     June 1991 (Trinity College)  
June 1991     Examination subjects: Quantum Field Theory I & II,  
String Theory, Group Theory, General Relativity, Cosmology

Massachusetts Institute     S.B. Physics, June 1990  
of Technology     S.B. Mathematics, June 1990  
Sept. 1986-June 1990

University of Rochester      3 physics + 3 math + 1 French linguistics course  
1985-1986                      during high school.

Harley School                  Rochester, NY  
Sept. 1974-June 1986

### **Extended Visits, Venues and Scientific Activities**

- Nov-Dec 2007    Member, Kavli Institute for Theoretical Physics Santa Barbara CA,  
Program on Star Formation
- June-July 2006    Participant, Aspen Center for Physics, Aspen CO,  
Workshop on Magnetic Self-Organization
- May-June 2005    Member, Institute for Theoretical Physics, Santa Barbara CA  
Program on Accretion and Outflows
- Nov 2004        Member, Isaac Newton Institute, Cambridge Univ., Cambridge, UK CA  
Program on Magnetohydrodynamics of Stellar Interiors
- June 2004        Co-Organizer, Topical Session on Astrophysical Coronae  
AAS Meeting, Denver, CO
- Mar 2004        Member, Institute for Theoretical Physics, Santa Barbara CA  
Program on Planet Formation: Terrestrial and Extra Solar
- June 2003        Participant, Aspen Center for Physics, Aspen CO  
Workshop on Magnetic Reconnection
- Dec 2002        Sabbatical faculty visitor, Princeton Plasma Physics Laboratory,  
Princeton University, Princeton NJ
- Sept-Nov 2002    Sabbatical faculty visitor, Department of Astrophysical Sciences,  
Peyton Hall, Princeton University, Princeton NJ
- June 2002-July 2002    Participant, Aspen Center for Physics, Aspen CO  
Workshop on astrophysical disks
- Feb 2002        Member, Institute for Theoretical Physics, Santa Barbara CA  
Solar Magnetohydrodynamics and Related Astrophysics Program
- Oct 2001        Magnetohydrodynamic Turbulence Workshop Co-organizer  
Virgin Gorda BVI
- May 2001        Visitor, School of Natural Sciences  
Institute for Advanced Study, Princeton NJ
- July 2000        Organizer/Participant, Aspen Center for Physics, Aspen CO

## Worskshop on Magnetic Dynamos

- April 2000 Member, Institute for Theoretical Physics, Santa Barbara CA  
Astrophysical Turbulence Program
- April 1999 Member, Institute for Theoretical Physics, Santa Barbara CA  
Black Hole Astrophysics Program
- Sep. 1998-Dec 1999 California Institute of Technology
- Sep. 1995-Sep. 1998 Institute of Astronomy, Cambridge UK,
- Aug 1996-Sept. 1996 Participant, Aspen Center for Physics, Aspen CO  
Workshop on galactic and cosmological magnetic fields
- Jan. 1992-Sept. 1995 Harvard University  
PhD. Thesis Advisor: Prof. George B. Field

### Pre-PhD Research Activities:

- Feb. 1992- May 1992 Harvard University; worked on left-right symmetric particle physics models with Sheldon Glashow in a decaying neutrino dark matter scheme.
- July. 1991- Aug. 1991 Math Institute, Park City UT  
Mathematical physics summer school
- Sept. 1991- Dec. 1991 Harvard University; worked on closed timelike curves in General Relativity with Tsvi Piran.
- May 1990- July 1990 Massachusetts Institute of Technology;  
worked with Irving Segal on his alternative cosmology.
- May. 1989- July 1989 Harvard-Smithsonian Center for Astrophysics;  
worked in Pat Slane's Chandra telescope mirror testing laboratory.
- Sept. 1988- March 1990 Massachusetts Institute of Technology;  
worked on strange quark matter with Robert Jaffe.
- June-Aug., 1987 and 1988 General Electric Corporate Research Center, Schenectady NY, USA  
worked on heat conduction in supercooled magnetic resonance imaging coils.
- Fall 1986 Massachusetts Institute of Technology;  
helped construct a helium recovery system for Tom Greytak's spin-polarized atomic hydrogen experiment.

### Other Professional Activities/National Service

- 2007- Editorial Board, Research Letters in Physics
- 2006- Defense Science Study Group (DSSG) & Consultant, Institute for Defense Analyses
- 2005-2006 Program Committee, APS Division of Plasma Physics
- May-Oct 2005 Organizing Chair, "Astrophysical Explosions" APS Mini-conference  
Division of Plasma Physics Meeting, Denver, Oct 24-25 2005.
- 2005 Chair, Program Committee of the American Physical Society's, Plasma Astrophysics Unit
- Oct 2003-2005 Executive Committee of the American Physical Society's, Plasma Astrophysics Unit
- 2002-2003 Harley School Board of Trustees (Private Secondary School in Rochester, NY)
- March 2002 NSF Frontier Centers Proposal Reviewer
- Mar 2002 DOE Fusion Science, Plasma Physics Review Panel
- Oct 2001 NSF Frontier Centers Review Panel Invitee (unable to participate)
- Feb 2001 NSF/DOE Plasma Physics Theory Grant Review Panel
- Jan 2001 NSF Extragalactic Astrophysics Theory Grant Review Panel
- July 2000 Organizer, Aspen Center for Physics, Aspen CO  
Workshop on Magnetic Dynamos
- Sept. 1997- Cambridge Univ. Representative, Particle Physics and Astronomy Research  
Council (PPARC) UK National Young Researchers Meeting
- Sept. 1993- Graduate Student Representative, Harvard Departmental Committee  
1995 on Academic Studies

### **Recent Grants**

'From Core to Outflow: Understanding the Driving and shaping of Asymmetric Planetary Nebulae' \$377,390 (P.I.: A.Frank; Co-I: E.G. Blackman) NSF, funded 2005-2008.

"Understanding Poynting Flux Dominated Outflows in Nature's Most Powerful Engines" \$371,568 (P.I.: E.G. Blackman, Co: G. Paesold, V. Pariev, M. Lyutikov) NASA, funded 2005-2009.

"Holding footpoints to the fire, planetary disk theory confronts observations" \$465,000, (P.I.: A. Quillen, Co-PIs: E.G. Blackman, A. Frank, D.M. Watson) National Science Foundation, Division of Astronomical Sciences, funded 2004-2007.

"Non-Axisymmetric Accretion Engines and Quasi-Periodic Oscillations in Microquasars" \$289,354, (P.I.: E.G. Blackman; Co-I/collaborator: P. Varniere) National Science Foundation, Division of Astronomical Sciences, funded 2004-2009.

”Astrophysics of Heterogenous Stellar Outflows” \$80,000, (P.I.: A. Frank; Co-PI: E.G. Blackman, P. Hartigan, J. Kastner, J.A. Morse), Space Telescope Science Institute, 2004-2005.

“New Approaches to the Origin and Dynamics of Magnetic Fields of Cosmic Relevance,” P.I.: E.G. Blackman, (Junior Faculty Development Award), \$450,000, Department of Energy, Plasma Physics Program, funded 2000-2004.

### **Awards and Such**

Department Award for Excellence in Undergraduate Teaching 2008

Who’s Who in America, 2008-

Defense Science Study Group, Institute for Defense Analysis, 2006-2007

Fellow of the American Physical Society (elected 2005)

Faculty Honoree in “Take 5” Program, University of Rochester, for Undergraduate Research Supervision 2004

Junior Faculty Development Award, Department of Energy, 2000-2004

AAS Travel Grant for invited talk at IAU Meeting 2001

Jewett Fund Prize, Harvard Univ. (for graduate school academic performance), 1993-1994

Trinity College Bursary Award, Cambridge Univ., 1990-1991

American Nuclear Society Full Tuition Fellowship, MIT, 1989-1990 (declined).

Harvard Book Award, Bausch and Lomb Science Prize, Sisson Mathematics Award, Language Scholar Award, Harley School, (Rochester NY) 1985-86.

Ralph S. McKee Trophy (Top Male Athlete) and Wooden Award (Sportsmanship), Harley School (Rochester NY), 1985-86.

Brighton-Pittsford Post Newspaper 1st team regional all-star and Finger Lakes first team all-star in soccer, Harley School (Rochester NY), 1985-86.

Distinguished Scholar Award (4 year merit-based tuition scholarship to the Harley School, Rochester NY), 1982-1986.

### **Memberships:**

American Physical Society (elected Fellow 2005)

American Astronomical Society

American Geophysical Union

Sigma Xi

### **Refereeing:**

Astronomy and Astrophysics, Astro-Particle Physics, Astrophysical Journal and Letters, Monthly Notices of the Royal Astronomical Society and Letters, Nature, Physical Review, Physical Review Letters, Physics of Fluids Physics of Plasmas, Geophysical and Astrophysical Fluid Dynamics, Astrophys. and Space Science...etc.

### **Courses Taught**

Astrophysical Fluid and Plasma Dynamics (PHY/AST 462 graduate course)

Radiative Processes (PHY/AST 461 graduate course)

Solar System (AST 104, undergraduate course for non-majors)

High Energy Astrophysics (PHY/AST 564 graduate course)

Milky Way/Galaxies (AST 232 undergraduate course)

Stellar Structure and Formation (AST 453 graduate course)

### **Research Supervision/Educational Activities**

**Postdocs:** Joachim Moortgat (PhD. Raboud Univ, Nimjen) 2006- Richard Edgar (PhD. Cambridge) 2006- Peggy Varniere (PhD. Saclay) 2004- Gunnar Paesold (PhD. ETH Zurich) 2003-2005; Jason Maron (PhD. Caltech) 2002-2004 Vladimir Pariev (PhD. Arizona) 2001-2004

**Grad. Students:** Rob Selkowitz(2000-), Alex Hubbard (2002-), Alexei Poludnenko (2001-w/Adam Frank) Jeong-Hoon Yang (2000-2001), Jason Nordhaus (2003-)

**Undergrads.:** Sean Hartnoll, Jason Nordhaus, Scott Verbridge, Jenn Witkowski, Snehal Patel, Wen-Fei Fong, Rob Penna,Ryan Pettibone, Lauren Weiss

**External PhD Examiner for:** Niels Haugen (Trondheim, Norway 2004); Julien Baerenzung (Nice, France 2007)

### **Departmental/University Service and Committees**

Marshall Scholarship Nomination Committee 2007 (Rachel Kincaid UR '07 won nationally)

Department Chair Evaluation/Recommendation Committee (2006-2007)

Department Executive Committee (2006-2007)

Editorial Consultant, Journal of Undergraduate Research 2005-2006

Faculty Recruitment Strategy Committee 2003-

Committee to Identify Future Faculty from Under Represented Groups 2003-

Graduate Curriculum Committee 2003-

Department Graduate Student Advisor 2002-

Astronomy & Astrophysics and Plasma Physics Advisory Committees 2000-

Primary Editor for Cross Sections, the Department Alumni Newsletter 2001-2002

Secondary Editor for Cross Sections, 2000-2001

Graduate Recruiting/Admissions Committee 2000-present

Graduate Teaching/Research Seminar co-organizer 2000-present

Department Written Qualifying Exam Committee 2001-present

Astronomy Colloquia Organizer 2000-2001, 2003

TA Training Committee 2000

Recruitment Luncheons for Prospective Varsity Athletes 2001-2008

### **Personal/Other**

Played varsity soccer, basketball, and tennis in high school and soccer, cross country/track at MIT.

Born (9/21/68) and raised in Rochester, N.Y.; U.S. Citizen. Hobbies include sports/fitness; doo-wop music; african grey parrot

Refereed Journals

1. E.G. Blackman and R.L. Jaffe 1989, "Concentration Limits on Terrestrial Strange Quark Matter from Heavy Isotope Searches," Nuclear Physics B324, 205.
2. E.G. Blackman and G.B. Field, 1993, "Ohm's Law for a Relativistic Pair Plasma," Physical Review Letters 71, 3481.
3. E.G. Blackman and G.B. Field, 1994, "Kinematics of Relativistic Magnetic Reconnection," Physical Review Letters 72, 494.
4. I.E. Segal, J.F. Nicholl, and E.G. Blackman, 1994, "Statistically Efficient Parallel Testing of Flux-Redshift Predictions in the Radio Band," Astrophysical Journal 430, 63.
5. I. Yi, G.B. Field, and E.G. Blackman, 1994, "On the Origin of Obscuring Tori in the Galactic Nucleus and Active Galactic Nuclei," Astrophysical Journal 432, L31.
6. E.G. Blackman and G.B. Field, 1994, "Relativistic Reconnection in an Astrophysical Pair Plasma," Physica Scripta T52, 93.
7. E.G. Blackman and G.B. Field, 1994, "Non-Thermal Acceleration from Reconnection Shocks," Physical Review Letters 73, 3097.
8. E.G. Blackman, 1996, "Reconnecting Flux Tubes as a source of *In Situ* Acceleration in Extragalactic Radio Sources," Astrophysical Journal Letters 56, L87.
9. T. Chou & E.G. Blackman, 1996, "A Magnetic Field Diagnostic for Sonoluminescence," Physical Review Letters 76, 1549.
10. E.G. Blackman & I. Yi, 1996, "Can the Formation of X-Ray Obscuring Tori and Jets in Active Galaxies be Determined by One Parameter?" Astrophysical Journal 461, L21.
11. E.G. Blackman, 1996, "Overcoming the Back Reaction on Turbulent Motions in the Presence of Magnetic Fields," Physical Review Letters 77, 2694.
12. Z. Kuncic, E.G. Blackman & M.J. Rees, 1996, "Physical constraints on the sizes of dense clouds in the central magnetospheres of active galactic nuclei," Monthly Notices of the Royal Astronomical Society 283, 1322.
13. E.G. Blackman, I. Yi, and G.B. Field, 1996, "Relativistic Precessing Jets and Cosmological Gamma-Ray Bursts," Astrophysical Journal, 473, L79.
14. I. Yi and E.G. Blackman, 1997, "Formation of Millisecond Pulsars from Accretion Induced Collapse and Constraints on Pulsar Gamma-Ray Burst Models," Astrophysical Journal 482, 383.
15. E.G. Blackman, 1997, "Distinguishing Solar Flare Types by Differences in Reconnection Regions," Astrophysical Journal 484, L79.
16. T.DiMatteo, E.G. Blackman, & A.C. Fabian, 1997, "Two-Temperature Coronae in Active Galactic Nuclei," Monthly Notices of the Royal Astronomical Society, 291, L23.
17. E.G. Blackman and T. Chou, 1997, "A Vorticity-Magnetic Field Dynamo Instability," Astrophysical Journal, 489, L95.

18. I. Yi and E.G. Blackman, 1997, "An explanation for the bimodal duration distribution of gamma-ray bursts: Millisecond pulsars from accretion-induced collapse," *Astrophysical Journal Letters*, 494, L63.
19. E.G. Blackman, 1998, "Importance of an Astrophysical Perspective for Textbook Relativity," *European Journal of Physics*, 19, 195.
20. E.G. Blackman, 1998, "In Situ Origin of Large Scale Galactic Magnetic Fields without Kinetic Helicity?" *Astrophysical Journal Letters*, 496, L17.
21. E.G. Blackman & I. Yi 1998, "On Fueling Gamma-Ray Bursts and their Afterglows with Pulsars," *Astrophysical Journal*, 498 L31.
22. E.G. Blackman, 1998 "Variability Associated with Alpha Accretion Disk Theory for Standard and Advection Dominated Disks," *Monthly Notices of the Royal Astronomical Society*, 299 L48.
23. J. Herrnstein, J. Moran, L. Greenhill, E.G. Blackman, and P. Diamond 1998, "Polarimetric Observations of Masers in NGC4258: An Upper Limit on the Large-Scale Magnetic Field 0.2 pc from the Central Engine," *Astrophysical Journal*, 508 243.
24. E.G. Blackman, 1999 "On Particle Energization in Accretion Flows," *Monthly Notices of the Royal Astronomical Society*, 302, 723.
25. G.B. Field, E.G. Blackman & H. Chou 1999, "Non-linear  $\alpha$ -Effect in Dynamo Theory," *Astrophysical Journal*, 513 638.
26. E.G. Blackman & G.B. Field, 1999, "Resolution of an Ambiguity in Magnetic Dynamo Theory and its Consequences for Backreaction Studies" *Astrophysical Journal* 521, 597.
27. E.G. Blackman, 1999, "Concave Accretion Discs and X-ray Reprocessing," *Monthly Notices of the Royal Astronomical Society*, 306 L25.
28. E.G. Blackman , 2000, "Mean Magnetic Field Generation in Sheared Rotators," *Astrophysical Journal*, 529 138.
29. E.G. Blackman & G.B. Field, 2000, " Constraints on the Magnitude of  $\alpha$  in Dynamo Theory" *Astrophysical Journal*, 534 984.
30. S.A.Hartnoll & E.G. Blackman, 2000, "Reprocessed emission from warped accretion discs with application to X-ray iron line profiles", *Monthly Notices of the Royal Astronomical Society*, 317, 880.
31. E.G. Blackman & G.B. Field 2000, "Coronal activity from dynamos in astrophysical rotators," *MNRAS* 318 724.
32. E.G. Blackman, A. Frank, & C. Welch, 2001, "Magnetohydrodynamic Stellar and Disk Winds: Application to Planetary Nebulae," *ApJ*, 546 288.
33. M. Lyutikov & E.G. Blackman, 2001, "Gamma-ray Bursts from unstable Poynting dominated outflows," *MNRAS* 321 177.
34. E.G. Blackman, 2001, "Implications of mean field accretion disc theory for vorticity and magnetic field growth," *MNRAS* 323 497.
35. E.G. Blackman, A. Frank, A. Markiel, J.H. Thomas, H.M. Van Horn , 2001, " Dynamos in asymptotic-giant-branch stars as the origin of magnetic fields shaping planetary nebulae," *Nature* 409 485.

36. S.A. Hartnoll & E.G. Blackman, 2001, "Reprocessed emission line profiles from dense clouds in geometrically thick accretion engines" MNRAS 324 257.
37. E.G. Blackman & G.B. Field, 2001, "How astrophysical mean field dynamos can circumvent existing quenching constraints," Physics of Plasmas 8 2407.
38. S.V. Lebedev, J.P. Chittenden, F.N. Beg, S.N. Bland, A. Ciardi, D. Ampleford, S. Hughes, M.G. Haines, A. Frank, E.G. Blackman, T. Gardiner, 2002, "Laboratory Astrophysics and Collimated Stellar Outflows: The Production of Radiatively Cooled Hypersonic Plasma Jets," ApJ 564, 113.
39. J.C. Lee, C.S. Reynolds, N.S. Schultz, R. Remillard, E.G. Blackman, A.C. Fabian, 2002, "Environment of GRS 1915+105 as seen with Chandra HETG and RXTE Evidence for a Hot Disk Atmosphere and Possible Supernova Origin," ApJ, 567 1102.
40. J. Maron and E.G. Blackman, 2002, "Effect of Fractional Kinetic Helicity on Turbulent Magnetic Dynamo Spectra," ApJ. Lett 566 L41.
41. S.A. Hartnoll & E.G. Blackman, 2002, "Iron line profiles from black hole accretion disks with spiral velocity structure" MNRAS 332, L1.
42. G.B. Field & E.G. Blackman, "Dynamical Quenching of the  $\alpha^2$  Dynamo," ApJ, 572, 685.
43. A. Poludnenko, A. Frank, E.G. Blackman, 2002 "Hydrodynamic Interaction of Shock Waves with Inhomogeneous Media I.: The Adiabatic Case," ApJ 576 832.
44. E.G. Blackman & A. Brandenburg, 2002, "Dynamical Quenching of Dynamos with Shear," ApJ, 579, 359.
45. E.G. Blackman & G.B. Field, "New Mean Field Dynamo Theory and Closure Approach," 2002, Phys. Rev. Lett., 89, 265007
46. H.M. Van Horn, J.H. Thomas, A. Frank, E.G. Blackman, 2003, "A Relaxation Oscillator Model for Shell Structures In Planetary Nebulae," ApJ 585 983.
47. E.G. Blackman & A. Brandenburg, "Doubly Twisted Coronal Ejections from Dynamos and their Role in Facilitating the Solar Cycle" 2003, ApJL, 584 L99
48. J.H. Kastner, B. Balick, E.G. Blackman, A. Frank, N. Soker, S.D. Vrtilek, G.A. Franz, J. Li 2003, "An X-ray Jet Detection Within the Planetary Nebula Menzel 3" ApJL, 591, L37.
49. V. Pariev, E.G. Blackman, S. Boldyrev, 2003 "Extending the Shakura-Sunyaev Formalism to Magnetically Dominated Disks ," Astronomy & Astrophysics, 407, 403
50. E.G. Blackman, 2003, "Understanding Helical Magnetic Dynamos with a Nonlinear Four-Scale Theory," MNRAS, 344, 707
51. E.G. Blackman & G.B. Field 2003, "A New Approach to Turbulent Transport of a Mean Scalar," Phys. of Fluids, 15, L73.
52. R. Sahai, J. H. Kastner, A. Frank, M. Morris, & E.G. Blackman, 2003 "X-Ray Emission from the Pre-Planetary Nebula He3-1475," ApJL, 599, L87.
53. J. Tan & E.G. Blackman, 2004, ApJ 603, 401, "Protostellar Disk Dynamos and Hydromagnetic Outflows in Primordial Star Formation,"
54. E.G. Blackman & R. Perna, 2004, "Pulsars With Jets May Harbor Dynamically Important Accretion Disks," ApJL, 601, L71.

55. A. Frank & E.G. Blackman, 2004, "Application of MHD Wind Models to Protoplanetary and Planetary Nebulae," *ApJ*, 614, 737.
56. E.G. Blackman, 2004 "How Spectral Shapes of Magnetic Energy and Magnetic Helicity Influence their Respective Decay Time Scales," *Plasma Physics and Cont. Fusion*, 46, 423
57. J.L. Maron, B.D. Chandran, & E. Blackman, 2004, "The divergence of neighboring magnetic field lines and fast-particle diffusion in strong magnetohydrodynamic turbulence, with application to thermal conduction in galaxy clusters," *Phys. Rev. Lett.*, 92, 045001
58. D.H. Douglass, E.G. Blackman, & R.S. Knox, 2004, *Physics Letters A*, 323, 315, "Temperature Response of Earth to the Annual Solar Irradiance Cycle"
59. E.G. Blackman & G.B. Field 2004, "Dynamical Magnetic Relaxation: A Magnetically Driven Dynamo in MHD Turbulence," *Phys. of Plasmas*, 11, 3264.
60. S.V. Lebedev, D. Ampleford, J.P. Chittenden, S.N. Bland, A. Ciardi, M.G. Haines, A. Frank, E.G. Blackman, A. Cunningham, 2004, "Jet Deflection via Cross-Winds: Laboratory Astrophysics Studies," *ApJ*, 616, 988.
61. E.G. Blackman & J.C. Tan, 2004, "Coronae & Outflows from Helical Dynamos, Compatibility with the MRI, and Application to Protostellar Disks," *Astrophysics and Space Science*, 292, 395.
62. R. Selkowitz & E.G. Blackman, 2004 "Stochastic fermi acceleration of sub-relativistic electrons and its role in solar flares," *MNRAS*, 354, 870
63. A. Quillen, E.G. Blackman, A. Frank, P. Varniere 2004, "On the Planet and Disk in Coku-Tau/4," *ApJL*, 612 L137
64. E.G. Blackman, 2005, "Bi-helical Magnetic Relaxation and Large Scale Magnetic Field Growth," *Physics of Plasmas*, 12, 012304,
65. S.V. Lebedev, A. Ciardi, D. Ampleford, S.N. Bland, S.C. Bott, J.P. Chittenden, G. Hall, J. Rapley, A. Frank, E. G. Blackman, T. Lery, 2005, "Magnetic Tower Outflows from a Radial Wire Array Z-Pinch," *MNRAS*, 361, 97
66. V.Pariev & E.G. Blackman, 2005, "Limitations of the Hamiltonian treatment for collisionless astrophysical accretion flows," *Baltic Astronomy*, 14, 265
67. E.G. Blackman & G.B. Field, 2005, "On the Inapplicability of the Zeldovich Relations in Magnetohydrodynamics," *Astronomische Nachrichten*, 326, 386.
68. P. Varniere & E.G. Blackman 2005, "Flux Modulation from Non-Axisymmetric Structures in Accretion Disks," *New Astronomy*, 11, 43
69. A. C. Quillen, S.L. Thorndike, A. Cunningham, A. Frank, R. A. Gutermuth, E.G. Blackman, J.L. Pipher, N. Ridge, 2005, "Turbulence driven by outflow-blown cavities in the molecular cloud of NGC 1333" *ApJ*, 632, 941
70. J.C. Tan & E.G. Blackman, 2005, "Star-forming accretion flows: An explanation for low luminosity nuclei of giant elliptical galaxies," *MNRAS*, 362, 983
71. G. Paesold, E.G. Blackman, & P. Mesmer, 2005, "On Particle Acceleration and Trapping by Poynting Flux Dominated Outflows," *Plasma Physics and Controlled Fusion*, 47 1925
72. Lebedev, S. V.; Ciardi, A.; Ampleford, D. J.; Bland, S. N.; Bott, S. C.; Chittenden, J. P.; Hall, G. N.; Rapley, J.; Jennings, C.; Sherlock, M.; Frank, A.; Blackman, E. G., 2005, *Plasma*

- Physics and Controlled Fusion, 47, 465, Production of radiatively cooled hypersonic plasma jets and links to astrophysical jets
73. P. Varniere, E.G. Blackman, A. Frank, A.P. Quillen, 2006, ApJ 640, 1110, "Rapid Hole Formation from Planets in Circumstellar Disks"
  74. E.G. Blackman, J.T. Nordhaus & J.H. Thomas, 2006, New Astronomy, 11, 452, "Extracting Rotational Energy in Supernova Progenitors: Transient Poynting Flux Growth vs. Turbulent Dissipation,"
  75. E. Blackman, 2006, Nature, 440, 148, (Correspondence) "Giants of physics found white-dwarf mass limits."
  76. Cunningham, A. J., Frank, A., & Blackman, E. G. 2006, in press ApJ, "Protostellar Jet Collisions Reduce the Efficiency of Outflow Driven Turbulence in Molecular Clouds"
  77. E.G. Blackman & H. Ji, 2006, MNRAS 369, 1837, Laboratory Plasma Dynamos, Astrophysical Dynamos, and Magnetic Helicity Evolution
  78. E.G. Blackman, 2006, in press Astrophys. Space. Sci, "Distinguishing Propagation vs. Launch Physics of Astrophysical Jets and the Role of Experiments."
  79. S.P. Matt, A. Frank, E.G. Blackman, 2006, ApJ Lett., 647 45, "Astrophysical Explosions Driven by a Rotating, Magnetized, Gravitating Sphere"
  80. J.T. Nordhaus, E.G. Blackman, 2006, MNRAS, 370, 204 "Low-Mass Binary Induced Outflows from Asymptotic Giant Branch Stars"
  81. A. Hubbard, E.G. Blackman, 2006, MNRAS 372 1717, "AGN Jet Mass Loading and Truncation by Stellar Winds"
  82. A. Ciardi, S. V. Lebedev, A. Frank, E. G. Blackman, D. J. Ampleford, C. A. Jennings, J. P. Chittenden, T. Lery, S. N. Bland, S. C. Bott, G. N. Hall, J. Rapley, F. A. Suzuki Vidal, A. Marocchino, 2006, in press, Astrophys. & Space Sci., 3D MHD Simulations of Laboratory Plasma Jets
  83. A. Hubbard, E.G. Blackman, 2006, New Astronomy 12, 246, "Planetsimal growth in turbulent discs before the onset of gravitational instability"
  84. Cunningham, A. J., Frank, A., Quillen, A. & Blackman, E. G. 2006, ApJ 653 416, "Outflow Driven Cavities: Numerical Simulations of Intermediaries of Protostellar Turbulence"
  85. Ren C., Blackman E.G., Fong Wen-fai, 2007, 14, 012901 Physics of Plasmas, Understanding the Saturation of the Proton Driven Weibel Instability and implications for Astrophysics
  86. Nordhaus, J., Blackman E.G., Frank A., 2007, accepted by MNRAS, Isolated vs. Common Envelope Dynamos in Planetary Nebula Progenitors
  87. D.J. Ampleford, A. Ciardi, S.V. Lebedev, S.N. Bland, S.C. Bott, J.P. Chittenden, G.N. Hall, A. Frank, E. Blackman, 2007, Astrophys. & Space Science, in press, Jet Deflection by a Quasi-Steady-State Side Wind in the Laboratory
  88. D.J. Ampleford, S.V. Lebedev, A. Ciardi, S.N. Bland, S.C. Bott, G.N. Hall, N. Naz, C.A. Jennings, M. Sherlock, J.P. Chittenden, A. Frank, E. Blackman, 2007, Astrophys. & Space Science, in press, Laboratory Modeling of Standing Shocks and Radiatively Cooled Jets with Angular Momentum

89. Ciardi, A.; Lebedev, S. V.; Frank, A.; Blackman, E. G.; Chittenden, J. P.; Jennings, C. J.; Ampleford, D. J.; Bland, S. N.; Bott, S. C.; Rapley, J.; Hall, G. N.; Suzuki-Vidal, F. A.; Marocchino, A.; Lery, T.; Stehle, C., 2007, in press, *Physics of Plasmas*. The evolution of magnetic tower jets in the laboratory
90. P. Hartigan, A. Frank, P. Varniere, E.G. Blackman, 2007, in press *Astrophys. J.*, Magnetic Fields in Stellar Jets
91. R. Selkowitz & E.G. Blackman, 2007 “The shock reprocessing model of electron acceleration in impulsive solar flares,” *MNRAS*, 379, 43.
92. R. Selkowitz & E.G. Blackman, 2007, “On the role of stochastic Fermi acceleration in setting the dissipation scale of turbulence in the interstellar medium, ” *MNRAS*, 382, 1119.
93. E.G. Blackman, 2007, *New Journal of Physics*, 9, 309, “Toward Coupling Flow Driven and Magnetically Driven Dynamos,”
94. Field G.B., Blackman, E.G., Keto, E., 2008, in press *MNRAS*, “A Model of Cloud Fragmentation.”
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97. Edgar, R.G., Nordhaus, J., Blackman, E.G., & Frank, A. 2008, *ApJL*, 675 L101. The Formation of Crystalline Dust in AGB Winds from Binary Induced Spiral Shocks
98. E.G. Blackman & G.B. Field, 2008, “Dimensionless Measures of Turbulent Magnetohydrodynamics Dissipation Rates” accepted by *MNRAS*
99. Nordhaus, J.; Minchev, I.; Sargent, B.; Forrest, W.; Blackman, E. G.; De Marco, O.; Kastner, J.; Balick, B.; Frank, A., 2008, “Spectral Determination of Material Geometry Around Evolved Stars: The Case of HD 179821s” accepted by *MNRAS*
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#### **Submitted to Refereed Journals/Archived**

101. Cunningham, A. J., Frank, A., Carroll, J., Blackman, E. G., & Quillen, A. C. 2008, *Protostellar Outflow Evolution in Turbulent Environments*, submitted to *ApJ*,
102. P. Varniere, E.G. Blackman, A. Frank, A.P. Quillen, 2007 “Evolution of Spectra from Protoplanetary Disks with an Embedded Planet,” submitted to *ApJL*
103. R. Edgar, E.G. Blackman, A.C. Quillen, P. Varnière, A. Frank, arXiv0706.2801E, “Growth of Eccentricity and Mass Clearing in a Disc Interior to a Planet”
104. A. Poludnenko, E.G. Blackman, A. Frank, “Formation of Turbulent Bi-Conical Structures in Accreting Systems and Application to Broad Line Regions of Active Galactic Nuclei,” *astro-ph/0201398*

105. A. Quillen, D.E. Trilling, & E.G. Blackman, “The impact of a close stellar encounter on the Edgeworth-Kuiper Belt,” astro-ph/0401372
106. Tan, J.C.; Beuther, H; Walter, F; Blackman, E.G., submitted to ApJ Evidence for Molecular Gas in the Nucleus of M87 and Implications for the Fuelling of Supermassive Black Holes

**Reviews, Conference Proceedings etc.**

107. E.G. Blackman and G.B. Field, 1995, “Relativistic Magnetic Reconnection,” Proceedings volume of *Physics of Space Plasmas*, MIT Space Plasma Symposium/Workshop Cambridge MA, ed. T. Chang, MIT Press, Cambridge, MA.
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109. J.C. Lee, N.S. Schulz, C.S. Reynolds , A.C. Fabian, & E.G. Blackman, 2001, “Chandra-ASCA-RXTE observations of the micro-quasar GRS 1915+105,” ASP Conf. Ser. 234: *X-ray Astronomy 2000*, 231
110. E.G. Blackman & G.B. Field, 2001, ”Mean Field Dynamo Saturation: Toward Understanding Conflicting Results,” in *Highlights of Astronomy* vol 12, as presented at the XXIVth General Assembly of the IAU - 2000 Edited by H. Rickman. San Francisco, CA: Astronomical Society of the Pacific
111. J.C. Lee, C.S. Reynolds, R. Remillard, N.S. Schulz, E.G. Blackman, & A.C. Fabian, 2002, “The Chandra HETGS and RXTE view of GRS 1915+105” in *New Views on MICROQUASARS, the Fourth Microquasars Workshop*, Institut d’Etudes Scientifiques de Cargèse, Corsica, France 2002 Eds. Ph. Durouchoux, Y. Fuchs, and J. Rodriguez. Published by the Center for Space Physics: Kolkata (India), p. 311.
112. J.H. Thomas, E.G. Blackman, A. Frank, H.M. van Horn, J.A. Markiel, “Dynamos in AGB Stars and Magnetic Shaping of Planetary Nebulae,” in *Magnetic Fields Across the Hertzsprung-Russell Diagram*, ASP Conference Proceedings Vol. 248. Edited by G. Mathys, S. K. Solanki, and D. T. Wickramasinghe. ISBN: 1-58381-088-9. San Francisco: Astronomical Society of the Pacific, 2001., p.439
113. E.G. Blackman, 2002, ”New Developments in Magnetic Dynamo Theory”, ” Invited Review/Paper for Springer-Verlag Lecture Notes in Physics (LNP) Textbook, based on July 2001, Paris Meeting *Magnetohydrodynamic Turbulence in Astrophysics: Recent Achievements and Perspectives*, Edited by E. Falgarone and T. Passot.
114. E.G. Blackman & S.A. Hartnoll, 2002, ”Emission Lines from Different Accretion Engine Geometries” in *Active Galactic Nuclei: from Central Engine to Host Galaxy* Edited by S. Collin, F. Combes.
115. A. Brandenburg & E.G. Blackman, 2002, “Magnetic helicity and the solar dynamo” in *Solar variability: from core to outer frontiers. The 10th European Solar Physics Meeting*, 2002, Ed. A. Wilson. ESA SP-506, Vol. 2. Noordwijk: ESA Publications Division, p. 805-810
116. A. Brandenburg, E.G. Blackman, 2002, “Helical Surface Structures,” in proceedings of IAU meeting 210: *Modelling of Stellar Atmospheres* (Uppsala, Sweden), astro-ph/0212019

117. E.G. Blackman, 2002, "On Magnetic Field Amplification in Gamma-Ray Burst Sources", "Invited Review/Overview Talk, First Niels Bohr Summer Institute *Beaming and Jets in Gamma Ray Bursts*, Edited by R. Ouyed, J. Hjorth and A. Nordlund.
118. A. Y. Poludnenko, A. Frank, E.G. Blackman, 2002, in "Mass outflow in Active Galactic Nuclei: New Perspectives, eds. D.M. Crenshaw, S.B. Kraemer, I.M. George, ASP Conference Series, 255, 285.
119. A. Brandenburg, E.G. Blackman, G.R. Sarson, 2003, "How magnetic helicity ejection helps large scale dynamos" to appear in *Adv. Space Sci. (Cospar 2002, ed. Buchner), astro-ph/0305374*.
120. S. Matt, A. Frank, & E. Blackman, 2003, "The Last Hurrah: PPN Formation by a Magnetic Explosion," to appear in "Asymmetrical Planetary Nebulae III" editors M. Meixner, J. Kastner, N. Soker, & B. Balick (ASP Conf. Series) astro-ph/0308548
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123. T.A. Gardiner, A. Frank, E.G. Blackman, S.V. Lebedev, J.P. Chittenden, D. Ampleford, S.N. Bland, A. Ciardi, M. Sherlock, M.G. Haines, 2003, "MHD Models and Laboratory Experiments of Jets," *Astrophysics and Space Science*, 287, 69
124. A. Brandenburg & E.G. Blackman, 2004, "Ejection of bi-helical fields from the sun," to appear in *Magnetic field and Helicity in the Sun and the Heliosphere*, eds: D. Rust & B. Schmieder, ASP Conference Series, XXV JD3, astro-ph/0312543
125. A. Frank, E.G. Blackman, A. Cunningham, S.V. Lebedev, D. Ampleford, A. Ciardi, S.N. Bland, J.P. Chittenden, M.G. Haines, 2005 "A HED Laboratory Astrophysics Testbed Comes of Age: JET Deflection via Cross Winds", *Astrophysics and Space Science*, 298, 107
126. Varnière, P., Blackman, E., & Muno, M. 2005, *American Institute of Physics Conference Series*, 797, 631, X-ray Modulation from Non-Axisymmetric Structures in Accretion Disk
127. Frank, A., Lebedev, S., Blackman, E., & Ciardi, A. 2005, *AIP Conf. Proc. 784: Magnetic Fields in the Universe: From Laboratory and Stars to Primordial Structures.*, 784, 205, Springs and Flings: Magneto-rotation Driven Outflows in Laboratory Experiments
128. Ciardi, A.; Lebedev, S. V.; Frank, A.; Blackman, E. G.; Ampleford, D. J.; Jennings, C. A.; Chittenden, J. P.; Lery, T.; Bland, S. N.; Bott, S. C.; Hall, G. N.; Rapley, J.; Suzuki Vidal, F. A.; Marochino, A. 2006, in press, *Astrophysics and Space Science*, 3D MHD Simulations of Laboratory Plasma Jets
129. Lebedev, S. V.; Ciardi, A.; Ampleford, D.; Bland, S. N.; Bott, S. C.; Chittenden, J. P.; Hall, G.; Rapley, J.; Frank, A.; Blackman, E. G., 2006, *SUPERSTRONG FIELDS IN PLASMAS: Third International Conference on Superstrong Fields in Plasmas. AIP Conference Proceedings*, 827, p.329. Laboratory Experiments with Supersonic Radiatively Cooled Jets: Jet Deflection via Crosswinds and Magnetic Tower Outflows
130. Moortgat, J., Blackman, E. G., Ren, C., Kong, X., & Yan, R. 2007, in *Proceedings of the final open meeting of the RTN 'GRBs, and enigma and tool': "070228 - The Next Decade of GRB*

afterglows, “Particle-in-cell simulations of fast collisionless reconnection in gamma-ray burst outflows”

131. Nordhaus J., Blackman, E. G. 2007, in proceedings of ”Asymmetric Planetary Nebulae IV,” R. L. M. Corradi, A. Manchado, N. Soker eds, (arXiv:0708.3792) “The Bipolar Engines of post-AGB stars: Transient Dynamos and Common Envelopes”
132. E.G. Blackman, J. Nordhaus, 2007, in proceedings of ”Asymmetric Planetary Nebulae IV,” R. L. M. Corradi, A. Manchado, N. Soker eds (arXiv:0708.4199) “Planetary Nebulae Principles & Paradigms: Binaries, Accretion, Magnetic Fields”
133. A. Frank, O. De Marco, E. Blackman, B. Balick 2007, in proceedings of ”Asymmetric Planetary Nebulae IV,” R. L. M. Corradi, A. Manchado, N. Soker eds “A Grand Challenge for PNe”
134. E.G. Blackman, M. Hale, S.H. Lisanby, 2008, Institute for Defense Analyses, Defense Science Study Group Paper, “Improving Traumatic Brain Injury Protection Measures and Standards for Helmets”

## Talks

1. Arcetri Observatory Colloquium (Florence, Italy) May 1993
2. Institute for Advanced Study (Princeton, NJ), Dec 1994
3. Harvard-Smithsonian Astrophysics Research Colloquium (Cambridge, MA) April 1995
4. Institute of Astronomy, Astrophysics Research Seminar (Cambridge, England) Feb 1996
5. Aspen Center For Physics (Aspen, CO) Aug 1996
6. Physics Colloquium, Warwick University (Coventry, England) Jan 1997
7. Institute D’Astrophysique de Paris (Paris, France) Feb 1997
8. Cambridge X-ray Astrophysics Seminar (Cambridge, England) March 1997
9. National Astronomy Meeting, Active Galactic Nuclei Session (Southampton, England) June 1997
10. Interstellar Turbulence Conference (Puebla, Mexico) Jan 1998.
11. Cambridge X-ray Astrophysics Seminar (Cambridge, England) March 1998
12. Particle Physics and Astronomy Research Council (PPARC) seminar (London, England) March 1998
13. Institute for Theoretical Physics (Santa Barbara, CA) April 1999
14. Institute for Theoretical Physics (Santa Barbara, CA) May 1999
15. University of Rochester, Astrophysics Colloquium (Rochester, NY) May 1999
16. UCLA Astronomy Colloquium (Los Angeles, CA) June 1999
17. CITA Astrophysics Colloquium (Toronto, Canada) Oct 1999
18. Caltech Theoretical Astrophysics Seminar (Pasadena, CA) Nov 1999
19. Cornell University, Relativity and Theor. Astrophysics Seminar, (Ithaca NY) Feb 2000
20. Cornell University, Astronomy Colloquium, (Ithaca NY) Feb 2000

21. Institute for Theoretical Physics, (Santa Barbara CA), Feb 2000
22. 1st Korean Institute for Advanced Study (KIAS) conference on Astrophysics (Seoul, Korea) May 2000
23. Aspen Center for Physics, (Aspen CO) June 2000
24. International Astronomical Union, (Manchester UK) Aug 2000
25. American Physical Society/DPP/International Congress on Plasma Physics (Quebec City, Canada) Oct 2000
26. Astronomy Colloquium, Penn State University, (State College PA) Mar 2001
27. NORDITA Meeting on Dynamos, (Copenhagen Denmark) Mar 2001 (unable to attend)
28. Institute for Advanced Study, (Princeton NJ), May 2001
29. American Physical Society, Division of Plasma Physics Meeting, (Long Beach CA) Nov 2001
30. MHD Turbulence Workshop, (Virgin Gorda BVI), Dec 2001
31. Astrophysics Seminar, Johns Hopkins Univ., (Baltimore MD), Jan 2002
32. Institute for Theoretical Physics, (Santa Barbara CA), Mar 2002
33. Columbia University, Plasma Physics Colloquium ( New York, NY), April 2002
34. Harvard University, Center for Astrophysics (Cambridge MA), May 2002
35. NYS APS Meeting Fall 2002, (Syracuse NY), Oct 2002, (unable to attend)
36. Ringberg Castle Conference on Plasma Astrophysics, (Munich GDR) June 2002, (unable to attend)
37. Workshop on Accretion Disks, Aspen Center for Physics, (Aspen CO) July 2002,
38. Conference on Beaming and Collimation of Gamma-Ray Bursts (Copenhagen, Denmark) Aug 2002,
39. Princeton Univ., Department of Astrophysical Sciences, (Princeton NJ) Nov 2002,
40. Princeton Univ., Plasma Physics Lab, (Princeton NJ) Dec 2002,
41. Univ. of Iowa, Department of Physics and Astronomy Colloquium, (Iowa City, IA) March 2003,
42. Conference on Magnetic Fields in Star Formation, (Madrid, Spain), May 2003.
43. Aspen Workshop on Magnetic Reconnection, (Aspen CO), June 2003.
44. Asymmetric Planetary Nebulae Conference (Seattle WA) July 2003.
45. American Physical Society, Division of Plasma Physics Meeting, Session on Laboratory Plasma Astrophysics (Albuquerque NM) October 2003.
46. Astronomy Colloquium, Caltech, January 2004.
47. Theoretical Astrophysics Seminar, Caltech, January 2004.
48. Physics and Astronomy Colloquium, University of Rochester, February 2004.
49. Center for Magnetic Self-Organization Meeting, Madison WI, Aug 2004.

50. Meeting on Relativistic Plasmas and Magnetic Fields, Stanford CA, Aug 2004.
51. APS, Division of Plasma Physics Savannah GA, Nov 2004.
52. Applied Math Colloquium, Newcastle Univ., Newcastle UK, Dec 2004.
53. Isaac Newton Institute for Mathematical Sciences, Cambridge Univ., Cambridge UK, Dec 2004.
54. Canadian Institute for Theoretical Astrophysics, Univ. of Toronto, Toronto CA, Feb 2005.
55. Astronomy Colloquium, Univ. of Maryland, College Park, MD, Mar 2005.
56. Center For Magnetic Self-Organization Meeting, Princeton Plasma Physics Lab., Princeton , NJ, Apr 2005.
57. JILA/Univ. of Colorado, Boulder, CO, Oct 2005
58. UC Berkeley Theoretical Astrophysics Center, Berkeley, CA, Nov 2005
59. Relativistic Jets Conference, Ann Arbor, MI, Dec 2005
60. Laboratory for Laser Energetics, Univ. of Rochester, Rochester, NY, Mar 2006
61. Meeting on Laboratory Astrophysics, Rice Univ., Houston (unable to attend) , TX, Mar 2006
62. Workshop on Magnetic Self-Organization, Aspen Center for Physics, CO, June 2006
63. Workshop on Magnetohydrodynamic Turbulence with Application to and Planetary and Stellar Dynamos, NCAR, Boulder, CO, June 2006
64. Astronomy/Astrophysics Colloquium, University of Arizona, Tuscon AZ, Sept 2006
65. Center for Magnetic Self-Organization Meeting, Chicago IL, Feb 2007
66. US-Japan Workshop on Magnetic Reconnection, St. Michaels, MD Mar 2007
67. Asymmetric Planetary Nebula IV (La Palmas, Spain) Jun. 2007
68. Astronomy/Astrophysics Colloquium, Univ. of Illinois, Urbana IL, Sept. 2007
69. Institute for Defense Analyses, Alexandria VA, Oct. 2007
70. Kavli Institute for Theoretical Physics, Santa Barbara CA, Oct. 2007
71. Rochester Insitute of Technnology, Rochester NY, Feb. 2008
72. Turbulence and Dynamos Program, NORDITA, Stockholm Sweden, April 2008
73. Magnetic Field Generation/Dynamo Conference, KITP (UCSB), Santa Barbara CA, July, 2008
74. IAU Symposium on Magnetic Fields in Astrophysics, Tenerife, Spain, November 2008