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- Citizenship** German
- Education** University of Münster, B.Sc. (Mathematics/Informatics), July 1993
University of Bonn: M.Sc. (Physics), June 1998
title: *The Metal-rich Globular Clusters of the Milky Way*
advisor: Tom Richtler
University of Heidelberg: PhD (Physics/Astronomy), July 2001
title: *Turbulence and Fragmentation in Molecular Clouds*
advisors: Andreas Burkert, Mordecai-Mark Mac Low
- Employment** Research Fellow
Department of Astronomy, University of Michigan, Ann Arbor
March 2006 – present
Research Staff Scientist (level C1)
University Observatory Munich
October 2003 – February 2006
Research Associate
Department of Astronomy, University of Wisconsin-Madison
January 2003 – September 2003
Research Associate
JILA, University of Colorado at Boulder
October 2001 – December 2002
Research Assistant (BAT IIa/2)
Max-Planck-Institute for Astronomy, Heidelberg
July 1998 – September 2001

Areas of Interest	computational astrophysics, dynamics and physical processes of the interstellar medium, plasma physics, molecular cloud formation and evolution, star formation, turbulent transport
Fellowships and Awards	Science and Technology Facilities Council (STFC) Advanced Fellowship (UK) March 2008; declined Otto-Hahn Award of the Max-Planck-Society (5% best PhD theses/year) June 2002 Feodor-Lynen Fellowship of the Alexander-von-Humboldt Foundation (maximum support) November 2001 – September 2003 Scholarship of the State of Bavaria (Stipendium nach BayBFG §10, Abs.3; 100% support, maximum period) 1991 – 1997
Current and Past Grants	NCSA, AST 060034 (PI) Disruption of High Velocity Clouds in the Galactic Halo awarded: 350,000 hours (100%) NASA/Herschel, NHSC 1008 (Co-PI, with L. Hartmann, E. Bergin) A Database of Turbulent Cloud Models awarded: \$73,500 (100%) NCSA, AST 060031 (PI) Rapid Star Formation in Colliding Flows awarded: 131,500 hours (100%) NSF 0507164 (Co-PI, PI: B. Whitney) Radiation Transfer in Aligned Grains: Probing Magnetic Fields in Molecular Clouds, Protostars and Disks awarded: \$112,016 NCSA, AST 040026 (Co-PI, PI: E. Zweibel) Turbulent magnetic diffusion during molecular cloud formation awarded: 9,000 hours NCSA, AST 030010 (PI) Magnetic Flux Transport in the Interstellar Medium awarded: 20,000 hours NCSA/NRAC, MCA99S024 (CO-I, PI: M.-M. Mac Low) The Turbulent Interstellar Medium and Star Formation awarded: 160,000 hours NCSA, AST 010002 (CO-I, PI: M.-M. Mac Low) Star Formation and Planetary Impacts awarded: 45,000 hours
Pending Grants	NSF (with L. Hartmann) Flow-Driven Molecular Cloud Formation: An Origin of the IMF?

Advising	<i>Graduate Students:</i>
Experience	Jennifer Stone (U Wisconsin, with E. Zweibel) magnetized corrugation instabilities
	Wen-Hsin Hsu (U Michigan, with M. Putman) disruption of high velocity clouds
	Jana Grcevich (U Michigan, with M. Putman) gas stripping of dwarf spheroidals
	Matthew Palotti (U Wisconsin, with E. Zweibel) shear flows in partially ionized plasmas
	Matthias Gritschneider (U Munich, with T. Naab) ionization-driven turbulence
	Steffi Walch (U Munich, with T. Naab) collapse of molecular cores and disk formation
	Christer Watson (U Wisconsin, with E. Zweibel) shear layers in weakly ionized plasmas
	<i>Undergraduate Students:</i>
	David Williams (U Michigan), molecular cloud formation in shear flows
	Holger Stiele (U Munich), thermal instability and ambipolar drift
	Audra Hernandez (U Colorado, with E. Zweibel), polarization maps of cores
	Queennie Taylor (U Wisconsin), turbulence in diffuse mid-infrared emission
Teaching	<i>Physics of the Interstellar Medium</i> (Ann Arbor, 2007)
Experience	graduate class; co-teaching with E. Bergin
	<i>Computational Methods in Astrophysics</i> (Munich, 2005)
	undergraduate/graduate lab course
	<i>Modern Numerical Methods for Astrophysics</i> (Munich, 2005)
	graduate seminar
	<i>Star Formation: A solved problem?</i> (Munich, 2004)
	graduate class
	<i>Cosmic Electrodynamics</i> (Munich, 2004)
	undergraduate/graduate class
	<i>Physical Processes in the Interstellar Medium</i> (Munich, 2003)
	graduate class
	Teaching Assistant
	classical mechanics, quantum mechanics, general astronomy
Professional	Astronomische Gesellschaft (German Astronomical Society)
Associations	American Astronomical Society
Service	public outreach coordinator (at University Observatory Munich)
	colloquium organizer (at Dept. of Astronomy, U Michigan, 2006/07)
	panelist for NASA Astrophysics Theory Program
	referee for ApJ, MNRAS, A&A

Refereed

1. *Rapid Molecular Cloud and Star Formation: Mechanisms and Movies*
Heitsch, F., Hartmann, L., 2008, ApJ, 689, 000
2. *Fragmentation of Shocked Flows: Gravity, Turbulence and Cooling*
Heitsch, F., Hartmann, L.W., Burkert, A. 2008, ApJ, 683, 786
3. *Fast Dynamos in Weakly Ionized Gases*
Zweibel, E.G. & **Heitsch, F.** 2008, ApJ, *accepted*
4. *Evolution of Unmagnetized and Magnetized Shear Layers*
Palotti, M., **Heitsch, F.**, Zweibel, E.G., Huang, Y.-M. 2008, ApJ, 678, 234
5. *Cooling, Gravity and Geometry: Flow-Driven Massive Core Formation*
Heitsch, F., Hartmann, L.W., Slyz, A.D., Devriendt, J.E.G., Burkert, A. 2008, ApJ, 674, 316
6. *Magnetized Nonlinear Thin-Shell Instability: Numerical Studies in Two Dimensions*
Heitsch, F., Slyz, A.D., Devriendt, J.E.G., Hartmann, L.W., Burkert, A. 2007, ApJ, 665, 445
7. *The Frequency of Mid-Infrared Excess Sources in Galactic Surveys*
Uzpen, B., Kobulnicky, H.A., Monson, A.J. et al. (+ **Heitsch, F.** and 26 co-authors) 2007, ApJ, 658, 1264
8. *Structure Generation by Irradiation: What can GLIMPSE teach us about the ISM structure?*
Heitsch, F., Whitney, B.A., Indebetouw, R. et al. (+ 3 co-authors) 2007, ApJ, 656, 227
9. *Cloud Dispersal in Turbulent Flows*
Heitsch, F., Slyz, A.D., Devriendt, J.E.G., Burkert, A. 2006, MNRAS, 373, 1379
10. *Thermal Instability in a Weakly Ionized Plasma*
Stiele, H., Lesch, H., **Heitsch, F.** 2006, MNRAS, 372, 862
11. *The Birth of Molecular Clouds: Formation of Atomic Precursors in Colliding Flows*
Heitsch, F., Slyz, A.D., Devriendt, J.E.G., Hartmann, L.W., Burkert, A. 2006, ApJ, 648, 1052
12. *The Formation of Turbulent Molecular Clouds: A Modeler's View*
Heitsch, F. 2006, Reviews in Modern Astronomy, 19, 157
13. *Formation of Structure in Molecular Clouds: A Case Study*
Heitsch, F., Burkert, A., Hartmann, L., Slyz, A.D., Devriendt, J.E.G. 2005, ApJL, 633, 113
14. *Identification of Main-Sequence Stars with Mid-Infrared Excess Using GLIMPSE: β Pictoris Analogs?*
Uzpen, B., Kobulnicky, H.A., Olsen, K.A.G. et al. (+ **Heitsch, F.** and 22 co-authors) 2005, ApJ, 629, 512

15. *RCW 49 at Mid-Infrared Wavelengths: A GLIMPSE from the Spitzer Space Telescope*
Churchwell, E., Whitney, B.A., Babler, B.L. et al. (+ **Heitsch, F.** and 17 co-authors)
2004, ApJS, 154, 322
16. *A GLIMPSE of Star Formation in the Giant HII Region RCW 49*
Whitney, B.A., Indebetouw, R., Babler, B.L. et al. (+ **Heitsch, F.** and 17 co-authors)
2004, ApJS, 154, 315
17. *Dust Heating by the Interstellar Radiation Field in Models of Turbulent Molecular Clouds*
Bethell, T., Zweibel, E.G., **Heitsch, F.**, Mathis, J.S. 2004, ApJ, 610, 801
18. *Magnetic Flux Transport in the ISM Through Turbulent Ambipolar Diffusion*
Heitsch, F., Zweibel, E.G., Slyz, A. D., Devriendt, J.E.G. 2004, ApSS, 292, 45
19. *Canals beyond Mars. Beam Depolarization in Radio Continuum Maps of the Warm ISM*
Haverkorn, M., **Heitsch, F.** 2004, A&A, 421, 1011
20. *Kelvin-Helmholtz-Instability in a Weakly Ionized Medium*
Watson, C., Zweibel, E.G., **Heitsch, F.**, Churchwell, E. 2004, ApJ, 608, 274
21. *The Formation of Protostellar Cores out of a Turbulent Cloud*
Li, P.S., Norman, M.L., Mac Low, M.-M., **Heitsch, F.** 2004, ApJ, 605, 800
22. *Turbulent Ambipolar Diffusion: Numerical Studies in 2D*
Heitsch, F., Zweibel, E.G., Slyz, A.D., Devriendt, J.E.G. 2004, ApJ, 603, 165
23. *Suppression of Fast Reconnection by Magnetic Shear*
Heitsch, F., Zweibel, E.G. 2003, ApJ 590, 291
24. *Fast Reconnection in a Two-Stage Process*
Heitsch, F., Zweibel, E.G. 2003, ApJ, 583, 229
25. *On the Structure of Self-gravitating Molecular Clouds*
Ossenkopf, V., Klessen, R.S., **Heitsch, F.** 2001, A&A, 379, 1005
26. *Magnetic Field Diagnostics Based on Far-Infrared Polarimetry: Numerical Simulations*
Heitsch, F., Zweibel, E.G., Mac Low, M.-M., Li, P.S., Norman, M.L. 2001, ApJ, 561, 800
27. *Gravitational Collapse in Turbulent Molecular Clouds II. MHD Turbulence*
Heitsch, F., Mac Low, M.-M., Klessen, R.S. 2001, ApJ, 547, 280
28. *The distribution of shock waves in driven supersonic turbulence*
Smith, M.D., Mac Low, M.-M., **Heitsch, F.** 2000, A&A, 361, 1121
29. *Gravitational Collapse in Turbulent Molecular Clouds I. Gasdynamical Turbulence*
Klessen, R.S., **Heitsch, F.**, Mac Low, M.-M. 2000, ApJ, 535, 887
30. *The Metal-rich Globular Clusters of the Milky Way*
Heitsch, F., Richtler, T. 1999, A&A, 347, 455

Submitted

31. *Faraday Tomography of an MHD-simulated Volume of Galactic ISM*
Schnitzeler, D.H.F.M., **Heitsch, F.**, Katgert, P., Haverkorn, M., A&A
32. *Flow-Driven Formation of Molecular Clouds: The Lagrangian View*
Heitsch, F., Naab, T., Walch, S., MNRAS

Selected Conference Proceedings

33. *Flow-Driven Formation of Massive Cores: Rapid & Efficient?*
Heitsch, F., Hartmann, L. 2008
in “Massive Star Formation: Observations Confront Theory”
eds: H. Beuther, H. Linz, & T. Henning; ASP Conference Series 387, 15
34. *Determining the Magnetic Field Strength From Polarimetry of Dense Molecular Cloud Cores: Theoretical Considerations*
Heitsch, F. 2005
in “Astronomical Polarimetry: Current Status and Future Directions”
eds: A. Adamson, C. Aspin, C. Davis, & T. Fujiyoshi; ASP Conference Series 343, 166
35. *Flux Transport in the ISM through Turbulent Ambipolar Diffusion*
Heitsch, F., Zweibel, E.G., Slyz, A.D., Devriendt, J.E.G. 2004
in “Magnetic Fields and Star Formation: Theory versus Observations”,
eds: A.I. Gómez de Castro, Kluwer Academic Press
36. *Alfvén-wave Driven Turbulence in Molecular Clouds*
Heitsch, F., Burkert, A. 2002
in “Modes of Star Formation and the Origin of Field Populations”,
eds. E. K. Grebel & W. Brandner; ASP Conference Series 285, 13
37. *Can Magnetized Turbulence Support Molecular Clouds?*
Heitsch, F., M.-M. Mac Low, Klessen, R. 2000
in “Proceedings of the 33rd ESLAB Symposium,
Star Formation from the Small to the Large Scale”,
ESTEC, Noordwijk, NL (ESA SP-445, Juni 2000); 391
38. *Effects of Magnetized Turbulence on the Structure and Dynamical Evolution of Molecular Clouds*
Heitsch, F., Mac Low, M.-M., Klessen, R. 1999
in “Plasma Turbulence and Energetic Particles” eds. Ostrowski, M. & Schlickeiser, R.,
Uniwersytet Jagiellonski, Kraków, 1999; 103

Invited Talks

1. *Rapid Star Formation in Colliding Flows: the Molecular Perspective*
at *HI Survival through Cosmic Times*, Abbazia di Spineto, Italy; 06/14/2007
2. *Magnetohydrodynamic Boltzmann Solvers*
at *Structure Formation in the Universe: Galaxies, Stars Planets*, Chamonix, France; 05/29/2007
3. *Formation of Small Scale Structure in Large Scale Flows in the ISM*
at *Microstructures in the Interstellar Medium*, Lake Geneva, WI; 04/24/2007
4. *Turbulence Generation in Filamentary Molecular Clouds: a modeler's view*
at *Annual Conference of the Astronomische Gesellschaft*, Cologne, Germany; 09/30/2005

Colloquia

MPIA Heidelberg (01/28/2000, 06/01/2001);
U Wisconsin-Madison (09/16/2003);
AIP Potsdam (11/11/2004);
U Basel (06/21/2005);
U Wisconsin-Madison (09/06/2005);
MPIfR Bonn (10/14/2005);
U Tübingen (05/29/2006);
USM Munich (05/31/2006);
U Illinois, Urbana-Champaign (10/24/2006);
U Michigan, Ann Arbor (11/09/2006);
U Colorado-Boulder (11/29/2006);
U Iowa (12/04/2006);
U Toledo (12/07/2006);
UNAM Morelia (12/14/2006);
U Florida, Gainesville (10/10/2007);
U Wyoming, Laramie (11/27/2007);
U Arizona-Tucson/Steward Observatory (03/06/2008);

Selected Seminars

U Illinois, Urbana-Champaign (04/24/2000);
U Colorado-Boulder (10/26/2001)
U Oxford (06/03/2002);
MPIA Heidelberg (06/10/2002);
AMNH, New York (08/19/2002);
U Colorado-Boulder (11/21/2002);
U Chicago (04/08/2003);
ENS Lyon (11/18/2003);
U Chicago (04/07/2004);
U Iowa (12/05/2006);
U Virginia-Charlottesville (05/15/2007);
U Princeton (09/24/2007);
Northwestern, Evanston/IL (01/22/2008);