Fabian Heitsch

Department of Physics & Astronomy
University of North Carolina at Chapel Hill
Phillips Hall
CB 3255
Chapel Hill, NC 27599-3255

tel: +1 919 962 3998
fax: +1 919 962 0480

fheitsch@unc.edu
www.physics.unc.edu/∼fheitsch

December 20, 2011

Areas of Interest

computational astrophysics, magnetohydrodynamics, galactic matter cycles, physics of Galactic and extra-galactic star formation, dynamics and physical processes of the interstellar medium, plasma physics, chemical enrichment and turbulent mixing

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), June 2001
title: *Turbulence and Fragmentation in Molecular Clouds*
advisors: Andreas Burkert, Mordecai-Mark Mac Low

Employment

Assistant Professor
Department of Physics & Astronomy,
University of North Carolina, Chapel Hill
July 2009 – present

Assistant Research Scientist
Department of Astronomy, University of Michigan, Ann Arbor
March 2009 – June 2009

Research Fellow
Department of Astronomy, University of Michigan, Ann Arbor
March 2006 – February 2009

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

Fellowships and Awards

Science and Technology Facilities Councel (STFC) Advanced Fellowship (UK)
March 2008; declined

Otto-Hahn Award of the Max-Planck-Society
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

Refereed Articles

1. *Rapid Star Formation and Global Gravitational Collapse*
   Hartmann, L., Ballesteros-Paredes, J., **Heitsch, F.** 2001, Monthly Notices of the RAS, *in press*

2. *Modes of Star Formation in Finite Molecular Clouds*
   Pon, A., Johnstone, D., **Heitsch, F.** 2011, Astrophys. Journal, 740, 88-97

3. *Complex Structure in Class 0 Protostellar Envelopes II: Kinematic Structure from Single-Dish and Interferometric Molecular Line Mapping*
   Tobin, J.-J., Hartmann, L., Chiang, H.-F., (+**Heitsch F.** and 5 co-authors) 2011, Astrophys. Journal, 740, 45-97

4. *Gravity or Turbulence? II. Evolving Column Density PDFs in Molecular Clouds*
   Ballesteros-Paredes, J., Vázquez-Semadeni, E., Hartmann, L., Gazol, A., **Heitsch, F.**, Colin, P. 2011, MNRAS, 416, 1436-1442

5. *The Coalsack Near and Far*
   Beuther, H., Kainulainen, J., Henning, Th., Plume, R., **Heitsch, F.**, MNRAS, 533, 17-25

6. *Flow-Driven Cloud Formation and Fragmentation: Results from Eulerian and Lagrangian Simulations*
   Heitsch, F., Naab, T., Walch S. 2011, MNRAS, 415, 271-278

7. *W43, the Closest Molecular Cloud Complex of the Galactic Bar*
   Nguyen Luong, Q., Motte, F., Schuller, F., (+ **Heitsch, F.** and 6 co-authors) 2011, Astronomy & Astrophysics, 529, 41-56

8. *Formation of Cold Filamentary Structure from Wind-Blown Superbubbles*
   Ntormousi, E., Burkert, A., Fierlinger, K., **Heitsch, F.** 2011, Astrophys. Journal, 731, 13-28

9. *Physical Properties of Complex C*
   Hsu, W.-H., Putman, M., **Heitsch, F.**, Stanimirovic, S., Peek, J.E.G. 2011, AJ, 141, 57

10. *Gravity or Turbulence? The Velocity Dispersion–Size Relation*
    Ballesteros-Paredes, J., Hartmann, L.W., Vázquez-Semadeni, E., **Heitsch, F.**, Zamora-Aviles, M.A. 2011, MNRAS, 411, 65-70

11. *Spitzer View of Young Massive Stars in the LMC HII Complexex. II. N159*
    Chen, C.-H.R., Indebetouw, R., Chu, Y.-H., Gruendl, R.A., Testor, G., **Heitsch, F.**, Seale, J.P., Meixner, M., Sewilo, M. 2010, Astrophys. Journal, 721, 1206-1232

12. *Modelling Shear Flows with Smoothed Particle Hydrodynamics and Grid-Based Methods*
    Junk, V., Walch, S., **Heitsch, F.**, Burkert, A., Wetzstein, M. Schartmann, M., Price, D. 2010, Monthly Notices of the RAS, 407, 1933-1945

13. *Competitive Accretion in Sheet Geometry and the Stellar IMF*
Hsu, W.-H., Hartmann, L., **Heitsch, F.**, Gómez, G.C. 2010, Astrophys. Journal, 721, 1531-1546

14. *Spitzer and HHT Observations of Starless Cores: Masses and Environments*
Stutz, A.M., Rieke, G.H., Bieging, J.H. et al. (+ **Heitsch. F.** and 5 co-authors) 2009, Astrophys. Journal, 707, 137-166

15. *Numerical Star Formation Studies – A Status Report*
Klessen, R.S., Krumholz, M.R., **Heitsch, F.** 2009, Advanced Science Letters, *accepted*

16. *Gravitational Collapse and Filament Formation: Comparison with the Pipe Nebula*
Heitsch, F., Ballesteros-Paredes, J., Hartmann, L. 2009, Astrophys. Journal, 704, 1735-1742

17. *The Fate of High Velocity Clouds: Warm or Cold Cosmic Rain?*
Heitsch, F., Putman, M.E. 2009, Astrophys. Journal, 698, 1485-1496

18. *Spitzer View of Young Massive Stars in the LMC HII Complex N 44*
Chen, C.-H.R., Chu, Y.-H., Gruendl, R., Gordon, K.D., **Heitsch, F.** 2009, Astrophys. Journal, 695, 511-541

19. *Effects of Magnetic Field Strength and Orientation on Molecular Cloud Formation*
Heitsch, F., Stone, J.M., Hartmann, L.W. 2009, Astrophys. Journal, 695, 248-258

20. *Driving Turbulence and Triggering Star Formation by Ionizing Radiation*
Gritschneder, M., Naab, T., Walch, S., Burkert, A., **Heitsch, F.** 2009, Astrophys. JournalL, 694, 26-30

21. *iVINE - Ionization in the parallel tree/SPH code VINE: First results on the observed age-spread around O-stars*
Gritschneder, M., Naab, T., Burkert, A., Walch, S., **Heitsch, F.**, Wetzstein, M. 2009, Monthly Notices of the RAS, 393, 21-31

22. *Rapid Molecular Cloud and Star Formation: Mechanisms and Movies*
Heitsch, F., Hartmann, L.W. 2008, Astrophys. Journal, 689, 290-301

23. *Fast Dynamos in Weakly Ionized Gases*
Zweibel, E.G., **Heitsch, F.** 2008, Astrophys. Journal, 684, 373-379

24. *Fragmentation of Shocked Flows: Gravity, Turbulence and Cooling*
Heitsch, F., Hartmann, L.W., Burkert, A. 2008, Astrophys. Journal, 683, 786-795

25. *Evolution of Unmagnetized and Magnetized Shear Layers*
Palotti, M., **Heitsch, F.**, Zweibel, E.G., Huang, Y.-M. 2008, Astrophys. Journal, 678, 234-244

26. *Cooling, Gravity and Geometry: Flow-Driven Massive Core Formation*
Heitsch, F., Hartmann, L.W., Slyz, A.D., Devriendt, J.E.G., Burkert, A. 2008, Astrophys. Journal, 674, 316-328

27. *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, Astrophys. Journal, 665, 445-456

28. *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, Astrophys. Journal, 658, 1264-1288

29. *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, Astrophys. Journal, 656, 227-241

30. *Cloud Dispersal in Turbulent Flows*
Heitsch, F., Slyz, A.D., Devriendt, J.E.G., Burkert, A. 2006, Monthly Notices of the RAS, 373, 1379-1388

31. *Thermal Instability in a Weakly Ionized Plasma*
Stiele, H., Lesch, H., **Heitsch, F.** 2006, Monthly Notices of the RAS, 372, 862-868

32. *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, Astrophys. Journal, 648, 1052-1065

33. *The Formation of Turbulent Molecular Clouds: A Modeler's View*
Heitsch, F. 2006, Reviews in Modern Astronomy, 19, 157-162

34. *Formation of Structure in Molecular Clouds: A Case Study*
Heitsch, F., Burkert, A., Hartmann, L., Slyz, A.D., Devriendt, J.E.G. 2005, Astrophys. JournalL, 633, 113-116

35. *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, Astrophys. Journal, 629, 512-525

36. *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, Astrophys. JournalS, 154, 322-327

37. *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, Astrophys. JournalS, 154, 315-321

38. *Dust Heating by the Interstellar Radiation Field in Models of Turbulent Molecular Clouds*
Bethell, T., Zweibel, E.G., **Heitsch, F.**, Mathis, J.S. 2004, Astrophys. Journal, 610, 801-812

39. *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, 45-51

40. *Canals beyond Mars. Beam Depolarization in Radio Continuum Maps of the Warm ISM*
Haverkorn, M., **Heitsch, F.** 2004, Astronomy & Astrophysics, 421, 1011-1019

41. *Kelvin-Helmholtz-Instability in a Weakly Ionized Medium*
Watson, C., Zweibel, E.G., **Heitsch, F.**, Churchwell, E. 2004, Astrophys. Journal, 608, 274-281

42. *The Formation of Protostellar Cores out of a Turbulent Cloud*
Li, P.S., Norman, M.L., Mac Low, M.-M., **Heitsch, F.** 2004, Astrophys. Journal, 605, 800-818

43. *Turbulent Ambipolar Diffusion: Numerical Studies in 2D*
Heitsch, F., Zweibel, E.G., Slyz, A.D., Devriendt, J.E.G. 2004, Astrophys. Journal, 603, 165-179

44. *Suppression of Fast Reconnection by Magnetic Shear*
Heitsch, F., Zweibel, E.G. 2003, Astrophys. Journal 590, 291-295

45. *Fast Reconnection in a Two-Stage Process*
Heitsch, F., Zweibel, E.G. 2003, Astrophys. Journal, 583, 229-244

46. *Numerical Simulations of Magnetic Fields in Astrophysical Turbulence*
Zweibel, E.G., **Heitsch, F.**, Fan, Y. 2003, Lecture Notes in Physics, 614, 101-126

47. *On the Structure of Self-gravitating Molecular Clouds*
Ossenkopf, V., Klessen, R.S., **Heitsch, F.** 2001, Astronomy & Astrophysics, 379, 1005-1016

48. *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, Astrophys. Journal, 561, 800-814

49. *Gravitational Collapse in Turbulent Molecular Clouds II. MHD Turbulence*
Heitsch, F., Mac Low, M.-M., Klessen, R.S. 2001, Astrophys. Journal, 547, 280-291

50. *The distribution of shock waves in driven supersonic turbulence*
Smith, M.D., Mac Low, M.-M., **Heitsch, F.** 2000, Astronomy & Astrophysics, 362, 333-341

51. *Gravitational Collapse in Turbulent Molecular Clouds I. Gasdynamical Turbulence*
Klessen, R.S., **Heitsch, F.**, Mac Low, M.-M. 2000, Astrophys. Journal, 535, 887-906

52. *The Metal-rich Globular Clusters of the Milky Way*
Heitsch, F., Richtler, T. 1999, Astronomy & Astrophysics, 347, 455-472

Refereed Articles: Submitted

53. *Very Large Array Observations of Ammonia in Infrared-Dark Clouds II: Internal Kinematics*
Ragan, S.E., **Heitsch, F.**, Bergin, E.A., Wilner, D., Astrophys. Journal

54. *Disruption of Molecular Clouds by Supernovae*
Heitsch, F., Hartmann, L., Mamajek, E., Monthly Notices of the RAS

55. *Faraday Tomography of an MHD-simulated Volume of Galactic ISM*
Schnitzeler, D.H.F.M., **Heitsch, F.**, Katgert, P., Haverkorn, M., Astronomy & Astrophysics

Conference Proceedings (non-refereed)

56. *The Gaseous Halo Mask*
Putman, M.E., Joung, M.R., Grcevich, J., **Heitsch, F.** 2010
in "Galaxies and their Masks"
eds: D.L. Block, K.C. Freeman, I. Puerari; Springer, 87-96

57. *Dynamic Star Formation*
Hartmann, L., **Heitsch, F.**, Ballesteros-Paredes, J. 2009
in "Revista Mexicana de Astronomia y Astrofisica Conference Series", 35, 66-67

58. *Advanced Numerical Methods in Astrophysical Fluid Dynamics*
Hujeirat, A., **Heitsch, F.** 2009
in "Structure Formation in Astrophysics"
ed: G. Chabrier; Cambridge University Press, 110-118

59. *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, 15-19

60. *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, 166-170

61. *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

62. *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, 13-16

63. *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); 391-392

64. *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; 103-106

Invited Talks

1. *The Role of Filaments in Cloud Fragmentation, and the Formation of Cores*
   at *EPoS 2012 The Early Phase of Star Formation*, Ringberg, Germany; 07/01-06/12

2. *Large-Scale Interactions, their Global Galactic Budget and their Role in Shaping the ISM*
   at *The Milky Way in the Herschel Era*, Rome, Italy; 09/19-23/11

3. *What Turbulence Can (Not) Do for Massive Star Formation*
   at *Great Barriers in High-Mass Star Formation*, Townsville, QL, Australia; 09/13-17/10

4. *A Continuous Structuring Process: From Cloud To Star Formation*
   at *Herschel and the Formation of Stars and Planetary Systems*, Särö, Sweden; 09/06-09/10

5. *Physics of Cloud Formation and its Effect on Galactic Star Formation*
   at *From Stars to Galaxies*, Gainesville, FL; 04/07-10/10

6. *The Flow-Driven Formation of Molecular Clouds: Insights from Numerical Models*
   at *Pearls '09*, Space Telescope Science Institute, Baltimore, MD; 10/01/09

7. *Setting the Star Formation Efficiency: Lessons from Detailed Numerical Simulations*
   at *The SFR50*, Abbazia di Spineto, Italy; 07/07/2009

8. *The Making Molecular Clouds: The Role of Magnetohydrodynamical and Thermal Instabilities*
   at *Turbulence and Hydrodynamical Instabilities*, Garching, Germany; 11/19/2008

9. *Rapid Star Formation in Colliding Flows: the Molecular Perspective*
   at *HI Survival through Cosmic Times*, Abbazia di Spineto, Italy; 06/14/2007

10. *Magnetohydrodynamic Boltzmann Solvers*
    at *Structure Formation in the Universe: Galaxies, Stars Planets*, Chamonix, France; 05/29/2007

11. *Formation of Small Scale Structure in Large Scale Flows in the ISM*
    at *Microstructures in the Interstellar Medium*, Lake Geneva, WI; 04/24/2007

12. *Turbulence Generation in Filamentary Molecular Clouds: a modeler's view*
    at *Annual Conference of the Astronomische Gesellschaft*, Cologne, Germany; 09/30/2005

Colloquia

U Rochester (03/28/2011);
NC State (10/19/2009);
Herzberg Institute of Astrophysics, Victoria (04/28/2009);
U Michigan (03/19/2009);
UNC Chapel Hill (03/16/2009);
U Oakland (02/19/2009);
Columbia U (02/04/2009);
U Arizona-Tucson/Steward Observatory (03/06/2008);
U Wyoming, Laramie (11/27/2007);
U Florida, Gainesville (10/10/2007);
UNAM Morelia (12/14/2006);
U Toledo (12/07/2006);
U Iowa (12/04/2006);
U Colorado-Boulder (11/29/2006);
U Michigan, Ann Arbor (11/09/2006);
U Illinois, Urbana-Champaign (10/24/2006);
USM Munich (05/31/2006);
U Tübingen (05/29/2006);
MPIfR Bonn (10/14/2005);
U Wisconsin-Madison (09/06/2005);
U Basel (06/21/2005);
AIP Potsdam (11/11/2004);
U Wisconsin-Madison (09/16/2003);
MPIA Heidelberg (01/28/2000, 06/01/2001);

Selected Seminars

Northwestern, Evanston/IL (05/11/2010);
U Oxford (05/31/2008);
U Princeton (09/24/2007);
Northwestern, Evanston/IL (01/22/2008);
U Virginia-Charlottesville (05/15/2007);
U Iowa (12/05/2006);
U Chicago (04/07/2004);
ENS Lyon (11/18/2003);
U Chicago (04/08/2003);
U Colorado-Boulder (11/21/2002);
AMNH, New York (08/19/2002);
MPIA Heidelberg (06/10/2002);
U Oxford (06/03/2002);
U Colorado-Boulder (10/26/2001)
U Illinois, Urbana-Champaign (04/24/2000);

Courses Taught

ASTR505 *Interstellar Medium*, fall 2011. 10 students
ASTR705 *Interstellar Medium*, fall 2011. 3 students
PHYS331 *Numerical Methods for Scientists*, spring 2011. 35 students
PHYS331 *Numerical Methods for Scientists*, spring 2010. 24 students
ASTR705 *Interstellar Medium*, fall 2009. 6 students

Students Supervised

Graduate Students:

Christina Haig (in progress)
"From Clouds to Stars: Constraining the Initial Conditions for Star Formation"

Brandon Bartell (in progress)
"Do High Velocity Clouds Contain Dark Matter? A Numerical Exploration"

Matthew Goodson (in progress)
"Chemical Enrichment of the Young Solar System:
Understanding Injection Efficiencies"

Honor Thesis:

Susan Clark (in progress)
"Structure and Kinematics of High-Velocity Clouds"

Public Talks

"Our Neighborhood when the Sun was Born", Raleigh Astronomy Club, 10/14/2011
"The Birth and Death of Stars", Raleigh Astronomy Club, 04/23/2010
"The Birth and Death of Stars", Cameron Village Public Library, 11/22/2009

Art & Science

Meanwhile, More Light and *Here, I Am*
by U of Michigan Professor of Art & Design *Jim Cogswell*

Current and Past Grants

National Science Foundation, AST 1109085 (PI)
Chemical Enrichment of the Young Solar System
awarded: $327,059, 09/01/2011-08/31/2014

NASA/Herschel NHSC, OT 1, 1436036 (PI of subcontract)
Exploring the Dust Content of Galactic Winds with Herschel
awarded: $11,866, 06/20/2011-12/31/2013

NC Space Grant (PI; New Investigator Program)
Chemical Enrichment of the Young Solar System
awarded: $25,000, 07/01/2010-06/30/2012

NASA ATP09-0026 (PI of subcontract from U Michigan)
Evolution of Massive Black Hole Spins in Active Galactic Nuclei
awarded: $58,922, 01/01/2010-12/31/2012

National Science Foundation, AST 0807305 (PI of subcontract from U Michigan)
Flow-Driven Molecular Cloud Formation: An Origin of the IMF?
awarded: $107,087, 10/01/2008-09/30/2011

National Center for Supercomputing Applicatons, AST 060034 (PI)
Disruption of High Velocity Clouds in the Galactic Halo
awarded: 350,000 hours, 01/01/2008-06/31/2009

NASA/Herschel, NHSC 1008 (Co-PI, PI: L. Hartmann)
A Database of Turbulent Cloud Models
awarded: $73,500, 04/01/2008-03/31/2010

National Center for Supercomputing Applications, AST 060031 (PI)
Rapid Star Formation in Colliding Flows
awarded: 131,500 hours, 10/01/2006-12/31/2007

National Science Foundation, AST 0507164 (Co-I, PI: B. Whitney)
Radiation Transfer in Aligned Grains:
Probing Magnetic Fields in Molecular Clouds, Protostars and Disks
awarded: $112,016

Conference Organization	Session organizer: ”Interstellar Medium and Star Formation”, 77th Meeting of SESAPS, Baton Rouge, Oct 22-23
	Scientific organizing committee member, ”From Stars to Galaxies”, Gainesville/FL, 04/06-10/2010
Grant Proposal Evaluation	NASA Astrophysics Theory Program National Science Foundation Astronomy Program Natural Sciences and Engineering Council of Canada
Journal Referee	Astrophysical Journal (ApJ) Monthly Notices of the Royal Astronomical Society (MNRAS) Astronomy & Astrophysics (A&A) Journal of Computational Physics (JCP) Journal of Physics A
Committees	REU program “Computational Physics & Astrophysics”, 2011-2012 Graduate admissions, 2010-2012 Colloquium, 2009-2012
Dissertation Committees	Christina Haig (UNC-CH, Chair) Padraic Finnerty (UNC-CH) Amanda Moffett (UNC-CH) Brian Pohl (UNC-CH) Ed Santilli (UNC-CH) David Stark (UNC-CH) Ryan Tanner (UNC-CH) Javier Alonso (U Michigan, defense Jan 2010) Jana Grcevich (Columbia U) Wen-Hsin Hsu (U Michigan)