

# Mark H. Heyer

## Education

University of Massachusetts (1981-1986) Ph.D. (Astronomy)  
Boston College (1976-1980) B.S. (Physics, magna cum laude)

## Appointments

2013-present Adjunct Professor, University of Massachusetts  
2012-2013, 2018 Lecturer, University of Massachusetts  
2013, Visiting Scientist, Max Planck Institute for Radio Astronomy  
1999-2012, FCRAO Associate Director, University of Massachusetts  
2005-2012, Senior Research Professor, University of Massachusetts  
1997-2005, Research Associate Professor, University of Massachusetts  
1992-1997, Research Assistant Professor, University of Massachusetts  
1990-1992, Research Engineer, University of Massachusetts  
1988-1990, Assistant Professor, University of Pennsylvania  
1988-1990, Visiting Scientist, Carnegie Institution of Washington  
1986-1988 Carnegie Postdoctoral Fellow, Dept. of Terrestrial Magnetism, Carnegie Institution of Washington

## National Committees

NSF Visiting Committee to CalTech Submillimeter Observatory, 1996  
NSF Visiting Committee to CalTech Owens Valley Radio Observatory, 1999  
NSF Visiting Committee to Berkeley-Illinois-Maryland Array, 1999  
National Radio Astronomy Observatory 12m Proposal Review Panel, 2000  
National Radio Astronomy Observatory Very Large Array Proposal Review Panel, 2003-2005  
National Radio Astronomy Observatory GBT Proposal Review Panel, 2008-present  
National Astronomy and Ionosphere Center Users Committee, 2004-2006, Chair, 2006  
CARMA Proposal Review Committee 2006, 2007  
National Radio Astronomy Observatory K band Focal Plane Array CDR Committee, Chair, 2009  
National Radio Astronomy Observatory Users' Committee, 2010-2013 ALMA Review Panel (Chair), 2017-2019

## Graduate Students Supervised

Christopher Brunt, Ph.D. 1999  
Vesna Zivkov, M.S. 2005  
Hao Gong, M.S. 2006  
Frank Ripple, M.S. 2013  
Andrew Battisti, M.S. 2013

## Postdoctoral Scholars Supervised

Naomi Ridge (2000-2003)  
Christopher Taylor (1999-2002)  
Christopher Brunt (2003-2005)  
Robert Gutermuth (2008-2011)

## Refereed Publications

1. Yun, H-S, Lee, J-E., Evans, N.J.II, Offner, S.S.R, **Heyer, M.**, Cho, J., Gaches, B.A.L., Yang, Y-L., Chen, H-H, Choi, Y., Lee, Y-H, Baek, G., Choi, M., Kim, J., Kang, H., Lee, S., Tatematsu, K. “TIMES II: Investigating the Relation Between Turbulence and Star-forming Environments in Molecular Clouds” 2021, ApJ, 921, 31
2. Evans, N.J.II, **Heyer, M.**, Miville-Deschenes, M.A, Nguyen-Luong, Quang, Merello, M. “Which Molecular Cloud Structures are Bound?” 2021, ApJ, 920, 126
3. Yun, H.S. Yun, Lee, J-E, Choi, Y., Evans, N.J. II, Offner, S., **Heyer, M.**, Gaches, B.A.L., Lee, Y-H, Baek, G., Choi, M. Kang, H. Lee, S., Tatematsu, K., Yang, Y-L, Chen, H-H, Lee, Y. Jung, J.H., Lee, C., Cho, J. 2021, TIMES I: a Systematic Observation in Multiple Molecular Lines Toward the Orion A and Ophiuchus Clouds”, 2021, ApJS, 256, 16
4. Pokhrel,R., Gutermuth, R.A., Krumholz, M.R., Federrath, C. **Heyer, M.**, Khullar, S., Megeath, R., Myers, P.C., Offner, S.R., Pipher, J., Fischer, W.J., Henning, T., Hora, J.L “Star-Gas Surface Density Correlations in Twelve Nearby Molecular Clouds: The Single-Cloud Star Formation Relation”, 2021, ApJ, 912, L19
5. Tang, Y., Wang, Q. D., Wilson, G.W., **Heyer, M.H.**, Gutermuth, R.A., Schloerb, P., Yun, M.S., Bally, J., Loinard, L., Silich, S., Chavez, M., Haggard, D., Montana, A., Sanchez-Arguelles, D., Zeballos, M.,Zavala, J.A., Leon-Tavares, J. “AzTEC Survey of the Central Molecular Zone: Data Reduction, Analysis, and Preliminary Results” 2021, MNRAS, 505, 2392
6. Soler, J. D., Beuther, H., Syed, J., Wang, Y., Henning, Th, Glover, S. C. O., Klessen, R.S., Sormani, M.C., **Heyer, M.**, Smith, R. J., Urquhart, J.S., Yang, J., Su, Y., Zhou, X. “The filamentary structures in the CO emission toward the Milky Way disk”, 2021, AA, 651 L4
7. Dib, S., Bontemps, S., Schneider, N., Elia, D., Ossenkopf-Okada, V., Shadmehri, M., Arzoumanian, D., Motte, F., **Heyer, M.**, Nordlund, A., Ladjelate, B. “The structure and characteristic scales of molecular clouds” 2020, AA, 642, 177
8. Soler, J. D., Beuther, H., Syed, J., Wang, Y., Anderson, L. D., Glover, S. C. O., Hennebelle, P., **Heyer, M.**, Henning, Th., Izquierdo, A. F., Klessen, R. S., Linz, H., McClure-Griffiths, N. M., Ott, J., Ragan, S. E., Rugel, M., Schneider, N., Smith, R. J., Sormani, M. C., Stil, J. M. “The history of dynamics and stellar feedback revealed by the H I filamentary structure in the disk of the Milky Way” 2020, AA, 642 163
9. Syed, J., Wang, Y., Beuther, H., Soler, J. D., Rugel, M. R., Ott, J., Brunthaler, A., Kerp, J., **Heyer, M.**, Klessen, R. S., Henning, Th., Glover, S. C. O., Goldsmith, P. F., Linz, H., Urquhart, J. S., Ragan, S. E., Johnston, K. G., Bigiel, F. “Atomic and molecular gas properties during cloud formation” 2020, AA, 642, 68
10. **Heyer, M.**, Soler, J.D., Burkhart, B. “The relative orientation bewteen the magnetic field and gradients of the surface brightness withi thin velocity slices of  $^{12}\text{CO}$  and  $^{13}\text{CO}$  emission from the Taurus molecular cloud” 2020, MNRAS, 496, 4546
11. Pokhrel, R., Gutermuth, R.A., Betti, S.K., Offner, S. S. R., Myers, P.C., Megeath, S. T., Sokol, A.D., Ali, B., Allen, L., Allen, T. S., Dunham, M.M., Fischer, W.J., Henning, Th, **Heyer, M.**, Hora, J., Pipher, J.L., Tobin, J.J., Wolk, S.J. “Star-Gas Surface Density Correlations in 12 Nearby Molecular Clouds I. Data Collection and Star-sampled Analysis”, 2020, ApJ, 896, 60
12. Evans, N.J., II, Kim, K-T, Wu, J., Chao, Z., **Heyer, M.**, Liu, T., Nguyen-Luong, Q., Kauffmann, J. “Star Formation Occurs in Dense Gasm but What Does ”Dense” Mean?” 2020, ApJ, 894, 103
13. Wang, Y., Beuther, H., Rugel, M.R., Soler, J.D., Stil, J.M., Ott, J., Bihl, S., McClure-Griffiths, N.M., Anderson, L.D., Klessen, R.S., Goldsmith, P.F., Roy, N., Glover, S.C.O., Urquhart, J.S., **Heyer, M.**, Linz, H., Smith, R.H.J., Bigiel, F., Dempsey, J., Henning, T. “The HI/OH.Recombination line survey of the inner Milky Way: data release 2 and HI overview” , 2020, AA, 634, 83

14. Traficante, A., Fuller, G.A., Duarte-Cabral, A., Elia, D., **Heyer**, M.H., Molinari, S., Peretto, N., Schisano, E. “Multiscale dynamics in star-forming regions: the interplay between gravity and turbulence” 2020, MNRAS, 491, 431
15. Galli, P.A.B., Loinard, L., Bouy, H., Sarro, L.M., Ortiz-Leon, G.N. Dzib, S.A., Olivares, J., **Heyer**, M., Hernandez, J., Roman-Zuniga, C., Kounkel, M., Covey, K. “Structure and kinematics of the Taurus star-forming region from Gaia-DR2 and VLBI astrometry” 2019, AA, 630, 137
16. Sokol, A.D., Gutermuth, R.A., Pokhrel, R., Gomez-Ruiz, A.I., Wilson, G.W., Offner, S.S.R, **Heyer**, M, Luna, A., Schloerb, F.P., Sanchez, D. “Early science with the Large Millimetre Telescope: An LMT/AzTEC 1.1mm survey of dense cores in the Monoceros R2 giant molecular cloud” 2019, MNRAS, 483, 407
17. Soler, J.D., Beuther, H. Rugel, M., Wang, Y., Clark, P.C., Glover, S.C.O., Goldsmith, P.F., **Heyer**, M., Anderson, L.D., Goodman, A., Henning, Th., Kainulainen, J., Klessen, R.S., Longmore, S.N., McClure-Griffiths, N.M., Menten, K.M., Mottram, J.C., Ott, J., Raganm S.E., Smith, R.J. “Histogram of oriented gradients: a technique for the study of molecular cloud formation”, 2019, AA, 622, 166
18. Rugel, M.R., Rahner, D. Beuther, H., Pellegrini, E.W., Wang, Y., Soler, J.D., Ott, J., Brunthaler, A., Anderson, L.D., Mottram, J.C., Henning, T., Goldsmith, P.F., **Heyer**, M., Klessen, R.S. Bühr, S., Menten, L.M., Smith, R.J., Urquhart, J.S., Ragan, S.E., Glover, S.C.O. “Feedback in W49A diagnosed with radio recombination lines and models”, 2019, AA, 622, 48
19. Galli, P., Loinard, L., Ortiz-Leon, G.N., Kounkel, M., Dzib, S.A., Mioduszewski, A.J., Rodriguez, L.F., Hartmann, L., Texeira, R., Torres, R.M., Rivera, J.L., Boden, A.F., Evans, N.J., Briceno, C., Tobin, J.J, **Heyer**, M. “The Goulds Belt Distances Survey (GOBELINS). IV. Distance, Depth and Kinematics of the Taurus Star-Forming Region” 2018, ApJ, 859, 33
20. Calzetti, D., et al. “Spatially Resolved Dust, Gas, and Star Formation in the Dwarf Magellanic Irregular NGC 4449”, ApJ, 852, 106, 2018
21. Anderson, L.D. et al. “Galactic supernova remnant candidates discovered by THOR”, 2017, AA, 605, 58
22. Vutisalchavakul, N., Evans, N.J., **Heyer**, M. “Star Formation Relations in the Milky Way”, 2016, ApJ, 831, 73
23. **Heyer**, M., Goldsmith, P.F., Yildiz, U.A., Snell, R.L., Falgarone, E., Pineda, J.L. “Striations in the Taurus molecular clouds: Kelvin-Helmholtz instability or MHD waves?” 2016, MNRAS, 461, 3918
24. Beuther,H. et al. “The HI/OH Recombination line survey of the inner Milky Way (THOR). Survey over view and data release 1”, 2016, AA, 595, 32
25. Koda, J., Scoville, N., **Heyer**, M. “Evolution of Molecular and Atomic Gas Phases in the Milky Way”, 2016, ApJ, 823, 76
26. Bühr, D. et al. “Continuum sources from the THOR survey between 1 and 2 GHz”, 2016, AA, 588, 97
27. **Heyer**, M., Gutermuth, R., Urquhart, J.S., Csengeri, T., Wienen,, M., Leurini, S., Menten, K., Wyrowsku,, F., “The rate and latency of star formation in dense massive clumps in the Milky Way”, 2016, AA, 588, 29
28. Roman-Duval, J., **Heyer**, M., Brunt, C.M., Clark, P., Klessen, R., Shetty, R. “Distribution and Mass of Diffuse and Dense CO Gas in the Milky Way”, 2016, ApJ, 818, 144
29. Yun, M.S. et al. “ Early Science with the Large Millimeter Telescope: CO and CII Emission in the z=4.3 AzTEC J095942.9+022938 (COSMOS AzTEC-1)”, 2015, MNRAS, 454, 3485

30. Pascucci, I., Edwards, S., **Heyer, M.**, Rigliaco, E., Hillenbrand, L. Gorti, U, Hollenbach, D., Simon, M.N. “Narrow Na and K Absorption Lines Toward T Tauri Stars: Tracing the Atomic Envelope of Molecular Clouds”, 2015, ApJ, 814, 14
31. **Heyer, M.** and Dame, T. “Molecular Clouds in the Milky Way”, 2015, ARAA, 53, 583
32. Bihr, S., Beuther, H., Ott, J., Johnston, K.G., Brunthaler, A., Anderson, L.D. + others including Heyer, M. “THOR – The HI, OH, Recombination Line Survey of the Milky Way. The pilot study – HI observations of the giant molecular cloud W43”, 2015, AA, 580, 112
33. Gutermuth, R.A. and **Heyer, M.** “A 24 micron Point Source Catalog of the Galactic Plane from Spitzer/MIPSGAL”, 2015, AJ, 149, 64
34. Dobbs, C. L. , Krumholz, M.R., Ballesteros-Paredes, J., Bolatto, A.D., Fukui, Y., **Heyer, M.**, Mac Low, M., Ostriker, E.C., Vazquez-Semadeni, E. “Formation of Molecular Clouds and Global Conditions for Star Formation”, 2014, Protostars and Planets VI, University of Arizona Press, eds. H. Beuther, R. Klessen, C. Dullemond, Th. Henning, p. 3-26
35. Panopoulou, G.V., Tassis, K., Goldsmith, P. F., **Heyer, M. H** 2014, “13CO filaments in the Taurus molecular cloud”, MNRAS, 444, 2507
36. Battisti, A.J. and **Heyer, M.H.**, ”The Dense Gas Mass Fraction of Molecular Clouds in the Milky Way” 2014, ApJ, 780, 173
37. Brunt, C.M. and **Heyer, M.H.**, ”Principal component analysis of spectral line data: analytic formulation”, 2013, MNRAS, 433, 117
38. Ripple,F., **Heyer, M.H.**, Gutermuth, R., Snell, R.L., Brunt, C.M. ”CO abundance variations in the Orion Molecular Cloud”, 2013, MNRAS, 431, 1296
39. Lee, J-J., Koo, B-C., Snell, R.L., Yun, M.S., **Heyer, M.H.**, Burton, M.G. ”Identification of Ambient Molecular Clouds Associated with Galactic Supernova Remnant IC 443”, ApJ, 749, 34L
40. **Heyer, M.** and Brunt, C.M., ”Trans-Alfvénic motions in the Taurus molecular cloud”, 2012, MNRAS, 420, 1562
41. Roman-Duval, J., Federrath, C. **Heyer, M.**, Jackson, J., Klessen, R. The Turbulent Spectrum of Molecular Clouds in the Galactic Ring Survey: A Density dependent Calibration of Principal Component Analysis 2011, ApJ, 740, 120
42. Snell, R.L. Narayanan, G., Yun, M.S., **Heyer, M.**, Chung, A., Irvine, W.M., Erickson, N.R., Liu, G. The Redshift Search Receiver 3mm Wavelength Spectra of Ten Galaxies, 2010, AJ, 141, 38
43. Chung, A., Yun, M.S., Narayanan, G., **Heyer, M.**, Erickson, N.R., Molecular Outflows form Massive Star Formation in the Local ULIRG Population, 2011, ApJ, 732, L15
44. Heiderman, A., Evans, N., Allen, L.E., Huard, T., **Heyer, M.** “The Star Formation Rate and Gas Surface Density Relation in the Milky Way: Implications for Extragalactic Studies 2010, ApJ, 723, 1019
45. Barriault, L., Joncas, G., Falgarone, E., Marshall,D.J., **Heyer,M.**, Boulanger,F., Foster,T. Brunt,C., Miville-Deschenes,M.-A., Blagrove,K, Kothes, R., Landecker, T.,Martin, P.G., Scott, D., Stil, J.M., Taylor, A.R., Multiwavelength observations of cirrus clouds in the North Celestial Loop: the transition from atomic to molecular gas, 2010, MNRAS, 406, 2713
46. Roman-Duval, J., Jackson,J.M., **Heyer,M.**, Rathborne,J., Simon,R. Physical Properties and Galactic Distribution of Molecular Clouds identified in the Galactic Ring Survey, 2010, ApJ, 723, 492
47. Brunt, C.M., **Heyer, M.H.**, & Mac Low, M. ”Turbulent Driving Scales in Molecular Clouds”, 2009, AA, 504, 883

48. Dib, S., Walcher, C. J., **Heyer, M.**, Audit, E., Loinard, L. “The Orientations of Molecular Clouds in the outer Galaxy: Evidence for the scale of the turbulence driver? ” 2009, MNRAS 398, 1201
49. Dent, W. R. F., Hovey, G., Dewdney, P. E., Burgess, T., Willis, A. G., Lightfoot, J. F., Jenness, T., Leech, J., Matthews, H. E., **Heyer, M.**, Poulton, C. “A large-scale CO survey of the Rosette Molecular Cloud: assessing the effects of O stars on surrounding molecular gas”, 2009, MNRAS, 395, 1805
50. Duval, J., Jackson, J.M., **Heyer, M.**, Johnson, A., Rathborne, J., Shah, R. “Kinematic Distances to Molecular Clouds identified in the Galactic Ring Survey” 2009, ApJ, 699, 1153
51. Chung, A., Narayanan, G., Yun, M.S., **Heyer, M.**, Erickson, N.R. “The Redshift Search Receiver Observations of the  $^{12}\text{CO}$  J=1-0 in 29 Ultraluminous Infrared Galaxies”, 2009, AJ, 138, 858
52. **Heyer, M.**, Krawczyk, C., Duval, J., Jackson, J. M. “Re-examining Larson’s Scaling Laws in Galactic Molecular Clouds”, 2009, ApJ, 699, 1092
53. Anderson, L. D., Bania, T. M., Jackson, J. M., Clemens, D. P., **Heyer, M.**, Simon, R., Shah, R. Y., Rathborne, J. M. “The Molecular Properties of Galactic H II Regions”, 2009, ApJS, 181, 255
54. Narayanan, G., **Heyer, M. H.**; Brunt, C., Goldsmith, P. F., Snell, R.L., Li, D. “The Five College Radio Astronomy Observatory CO Mapping Survey of the Taurus Molecular Cloud”, 2008, ApJS, 177, 341
55. Goldsmith, P.F., **Heyer, M.**, Narayanan, G., Snell, R., Li, D., Brunt, C. “Large-Scale Structure of the Molecular Gas in Taurus Revealed by High Linear Dynamic Range Spectral Line Mapping”, 2008, ApJ, 680, 428
56. **Heyer, M.**, Gong, H., Ostriker, E., Brunt, C. “Magnetically Aligned Velocity Anisotropy in the Taurus Molecular Cloud”, 2008, ApJ, 680, 420
57. Poulton, C. J., Robitaille, T. P., Greaves, J. S., Bonnell, I. A., Williams, J. P., **Heyer, M. H.** “A Spitzer survey of young stellar objects in the Rosette Molecular Cloud”, 2008, MNRAS, 384, 1249
58. Lee, J, Koo, B, Yun, M., Stanimirovic, S., Heiles, C., **Heyer, M.** “a 21 cm Spectral and Continuum Study of IC 443 Using the Very Large Array and the Arecibo Telescope”, 2008, AJ, 135, 796
59. **Heyer, M.H.**, Williams, J.P. & Brunt, C.M. “Turbulent Gas Flows in the Rosette and G216-2.5 Molecular Clouds: Assessing Turbulent Fragmentation Descriptions of Star Formation”, ApJ, 643, 956, 2006
60. Ridge, N., DiFrancesco, J., Kirk, H., Li, D., Goodman, A.A., Alves, J., Arce, H.G., Borkin, M.A., Caselli, P., Foster, J.B., **Heyer, M.H.**, Johnstone, D., Kosslyn, D.A., Lombardi, M., Pineda, J.E., Schnee, S.L., Tafalla, M., “The COMPLETE Survey of Star Forming Regions: Phase 1 Data” AJ, 131, 2921, 2006
61. Jackson, J. M., Rathborne, J. M., Shah, R. Y., Simon, R., Bania, T. M., Clemens, D. P., Chambers, E. T., Johnson, A. M., Dormody, M., Lavoie, R., **Heyer, M.** “The Boston University-Five College Radio Astronomy Observatory Galactic Ring Survey”, ApJS, 163, 145, 2006
62. **Heyer, M.H.** & Brunt, C. “The Universality of Turbulence in Galactic Molecular Clouds”, ApJ, 615, L45, 2004
63. **Heyer, M.H.** & Zweibel, E. ”Turbulence in the Star-forming Interstellar Medium: Steps toward Constraining Theories with Observations”, Astrophysics and Space Science, 292, (1-4), 9, 2004 *Magnetic Fields and Star Formation*, ed. A. Gomez, Kluwer, 2004,
64. **Heyer, M.H.**, Corbelli, E., Schneider, S.E., & Young, J.S. ”The Molecular Gas Distribution and Schmidt Law in M33”, ApJ, 602, 723, 2004

65. Brunt, C.M., **Heyer, M.H.**, Vazquez-Semadeni, E. & Pichardo, B. "Intrinsic, Observed, and Retrieved Properties of Interstellar Turbulence" *ApJ*, 595, 824, 2003
66. Williams, J.P, Plambeck, R.L., **Heyer, M.H.** " High resolution imaging of CO outflows in OMC-2 and OMC-3", *ApJ*, 591, 1025, 2003
67. Kraemer, K.E., Jackson, J.M., Kassis, M. Deutsch, L.K., Hora, J.L, Simon, R., Hoffmann, W.F., Fazio, G.G., Dayal, A., Bania, T.M., Clemens, D.P, **Heyer, M.H.**, "Five Star-forming Cores in the Galactic Ring Survey: A Mid-Infrared Study", *ApJ*, 588, 918, 2003
68. Snell, R.L., Carpenter, J.M., & **Heyer, M.H.** "Molecular Clouds and Infrared Stellar Clusters in the Far Outer Galaxy" *ApJ*, 578, 229, 2002
69. McQuinn, K.B., Simon, R. Law, C., Jackson, J.M., Bania, T.M., Clemens, D.P., & **Heyer, M.H.** "A Comparison of  $^{13}\text{CO}$  and CS Emission in the Inner Galaxy", *ApJ*, 576, 274, 2002
70. Jackson, J.M., Bania, T.M., Simon, R., Kolpak, M. Clemens, D., **Heyer, M.H.**, "H I Self-Absorption and the Kinematic Distance Ambiguity: The Case of the Molecular Cloud GRSMC 45.6+0.3", *ApJ*, 566, L81, 2002
71. Brunt, C.M. & **Heyer, M.H.** "Interstellar Turbulence. I. Retrieval of Velocity Field Statistics " *ApJ*, 566, 276, 2002
72. Brunt, C.M. & **Heyer, M.H.** "Interstellar Turbulence. II. Energy Spectra of Molecular Regions in the Outer Galaxy" *ApJ*, 566, 289, 2002
73. Paglione, T., Wall, W.F., Young, J.S., **Heyer, M.H.**, Richard, M., Goldstein, M. Kaufman, Z., Nantais, J., Perry, G. "A Mapping Survey of the  $^{13}\text{CO}$  and  $^{12}\text{CO}$  Emission in Galaxies", *ApJS*, 135, 183, 2001
74. Simon, R., Jackson, J.M., Clemens, D.P., Bania, T.M., **Heyer, M.H.**, "The Structure of Four Molecular Cloud Complexes in the BU-FCRAO Milky Way Galactic Ring Survey" *ApJ*, 551, 747, 2001
75. **Heyer, M.H.**, Carpenter, J.M., & Snell, R.L., "The Equilibrium State of Molecular Regions in the Outer Galaxy", *ApJ*, 551, 852, 2001
76. Carpenter, J.M., **Heyer, M.H.**, & Snell, R.L., "Embedded Stellar Clusters in the W3/W4/W5 Molecular Cloud Complex" *ApJS*, 130, 381, 2000
77. Taylor, A.R., Irwin, J.A., Matthews, H.E., & **Heyer, M.H.**, "JCMT Observations of Cometary Clouds in the Galactic Chimney near W4" *ApJ*, 513, 339, 1999
78. Loinard, L., Dame, T.M., **Heyer, M.H.**, Lequeux, J., and Thaddeus, P., "The Distribution and Kinematics of Molecular Gas in the SouthWest Half of M31", *AA*, 351, 1087, 1999
79. **Heyer, M.H.**, Brunt, C., Snell, R.L., Howe, J., Schloerb, F.P., and Carpenter, J.M "The FCRAO CO Survey of the Outer Galaxy", *ApJS*, 115, 241, 1998
80. **Heyer, M.H.** and Terebey, S. "The Anatomy of the Perseus Spiral Arm:  $^{12}\text{CO}$  and IRAS Imaging Observations of the W3/4/5 Cloud Complex", *ApJ*, 502, 265, 1998
81. Patel, N., Goldsmith, P.F., **Heyer, M.H.**, Snell, R.L., Pratap, P. "Origin and Evolution of the Cepheus Bubble", *ApJ*, 507, 241, 1998
82. Tatematsu, K., Umemoto, T., **Heyer, M.H.** "Molecular Cloud Cores in the Orion A Cloud. II. FCRAO CS (2-1) Data" *ApJS*, 118, 517, 1998
83. Goodman, A.A., Barranco, J.A., Wilner, D.J., **Heyer, M.H.**, "Coherence in Dense Cores. II. The Transition to Coherence", *ApJ*, 504, 223, 1998

84. Paglione, T.A, Jackson, J.M., Bolatto, A.D., **Heyer, M.H.** "Interpreting the HCN/CO Intensity Ratio in the Galactic Center", *ApJ*, 493, 680, 1998
85. Wolkovitch, D., Langer, W.D., Goldsmith, P.F., **Heyer, M.H.** "Physical Conditions in Quiescent Dark Cloud Cores Determined from Multitransition Observations of CCS", *ApJ*, 475, 241, 1997
86. **Heyer, M.H.** & Schloerb, F.P. "Application of Principal Component Analysis to Large-Scale Spectral Line Imaging Studies of the Interstellar Medium", *ApJ*, 474, 173, 1997
87. **Heyer, M.H.**, Brunt, C., Snell, R.L., Howe, J., Schloerb, F.P., Carpenter, J.M., Normandeau, M., Taylor, A.R., Dewdney, P.E., Cao, Y., Terebey, S., & Beichman, C.A. "A Massive Cometary Cloud Associated with IC 1805", *ApJ*, 464, L175, 1996
88. **Heyer, M.H.**, Carpenter, J.M., & Ladd, E.F., "Giant Molecular Cloud Complexes with Optical H II Regions: 12CO and 13CO Observations and Global Cloud Properties", *ApJ*, 463, 630, 1996
89. Jackson, J.M., **Heyer, M.H.**, Paglione, T.A.D., & Bolatto, A.D. "HCN and CO in the Central 630 Parsecs of the Galaxy", *ApJ*, 456, L91, 1996
90. Rogers, C. **Heyer, M.H.**, & Dewdney, P.E. "H I, CO, and IRAS observations of NGC 7023", *ApJ*, 442, 694, 1995
91. **Heyer, M.H.** & Ladd, E.F. "A multitransitional CO study of the Cepheus C cloud core", *ApJ*, 439, 269, 1995
92. **Heyer, M.H.**, Morgan, J., Schloerb, F.P., Snell, R.L., & Goldsmith, P.F., "Evidence for large-scale expanding motions within the Orion A molecular cloud", *ApJ*, 395, L99, 1992
93. Clemens, D.P., Yun, J.L., & **Heyer, M.H.** "BOK globules and small molecular clouds - Deep IRAS photometry and (C-12)O spectroscopy", *ApJS*, 75, 877, 1991
94. Graham, J.A. & **Heyer, M.H.** "New optical features in L1551 and HH30", *PASP*, 102, 972, 1990
95. **Heyer, M.H.**, Ladd, E.F., Myers, P.C., Cambell, B. "Infrared and optical imaging of newborn stars", *AJ*, 99, 1585, 1990,
96. **Heyer, M.H.** & Graham, J.A. "HH55 and its energy source", *PASP*, 102, 117, 1990
97. **Heyer, M.H.**, Snell, R.L., Morgan, J., Schloerb, F.P. "A CO and far-infrared study of the S254-S258 region", *ApJ*, 346, 220, 1989
98. **Heyer, M.H.** & Graham, J.A. "Newborn Stars and Stellar Winds in Barnard 228", *PASP*, 101, 816, 1989
99. Graham, J.A., & **Heyer, M.H.** "Young stars of low mass in the GUM nebula", *PASP*, 101, 573, 1989
100. Snell, R.L., Schloerb, F.P., & **Heyer, M.H.** "Comparison of the far-infrared and carbon monoxide emission in Heiles' Cloud 2 and B18", *ApJ*, 337, 739, 1989
101. Graham, J.A., & **Heyer, M.H.** "TH28 (Krautter's star) and its string of Herbig-Haro objects", *PASP*, 100, 1529, 1988
102. **Heyer, M.H.** "The magnetic evolution of the Taurus Molecular Clouds. II - A reduced role of the magnetic field in dense core regions", *ApJ*, 324, 311, 1988
103. Myers, P.C., **Heyer, M.H.**, Snell, R.L., Goldsmith, P.F. "Dense cores in dark clouds. V - CO outflow", *ApJ*, 324, 907, 1988
104. **Heyer, M.H.**, Strom, S.E., Strom, K.M., "The magnetic field geometry in the vicinity of HH 7-11/HH 12 and HH 33/HH 40" *AJ*, 94, 1653, 1987

105. **Heyer, M.H.**, Vrba, F.J., Snell, R.L., Schloerb, F.P., Strom, S.E., Goldsmith, P.F., Strom, K.M. "The magnetic evolution of the Taurus molecular clouds. I - Large-scale properties", *ApJ*, 321, 370, 1987
106. **Heyer, M.H.**, Snell, R.L., Goldsmith, P.F., & Myers, P.C. "A survey of IRAS point sources in Taurus for high-velocity molecular gas", *ApJ*, 321, 370, 1987
107. **Heyer, M.H.**, Snell, R.L., Goldsmith, P.F., Strom, S.E., & Strom, K.M. "A study of the morphology and kinematics of the dense gas associated with star-forming regions", *ApJ*, 308, 134, 1986
108. Vrba, F.J., Luginbuhl, C.B., Strom, S.E., Strom, K.M., **Heyer, M.H.** "An optical imaging and polarimetric study of the LYND 723 and Barnard 335 molecular outflow regions", *AJ*, 92, 633, 1986
109. Goldsmith, P.F., Snell, R.L., **Hemeon-Heyer, M.**, Langer, W.D. "Bipolar outflows in dark clouds", *ApJ*, 286, 599, 1984

## Recent Colloquia and Invited Talks

- "MHD turbulence in the Taurus molecular cloud", JPL Colloquium, 5 April 2019
- "Listening to the Milky Way", Colloquium at Wesleyan University, 6 March 2019
- "Molecular Gas in the Milky Way" Invited talk at Hendrik van de Hulst Centennial Symposium, 5-9 November 2018, Leiden, NL
- "Surveys with the Five College Radio Astronomy 14m Telescope" Invited talk at Velocity-Resolved Far-Infrared Imaging Spectroscopy of the Future, A Symposium Honoring Paul F. Goldsmith 18-19 October, 2018, Paris, France
- "Striations in molecular clouds: a signpost for MHD turbulence", Invited talk at Interstellar Medium Beyond 3D Workshop, Institut d'Astrophysique Spatiale, 19 July 2017
- "Fragmentation of Massive Clumps in the Milky Way", Colloquium CfA, 7 March 2017
- "Examining Star Formation Rates and Gas throughout the Milky Way", Invited talk at from Stars to Massive Stars – Connecting our understanding of massive star and star cluster formation through the universe Symposium, 6 April 2016
- "Revisiting Larsons 1981 Scaling Relationships in Galactic Molecular Clouds", Colloquium Boston University, 13 April 2015
- "The Structure and Organization of the Molecular ISM: The Galactic Perspective", invited talk at Ringberg Workshop on Regulation of Star Formation in Molecular Gas: from galactic to sub-cloud scales, 24 June 2013
- "CO Surveys of the Milky Way", Colloquium, Max Planck Institute for Radio Astronomy, 21 June 2013
- MHD Turbulence in Molecular Clouds, Colloquium, University of Cologne, 6 December 2013
- "Velocity Structure of Molecular Clouds", Invited Talk, Early Phase of Star Formation 2012, 2 July 2012
- MHD Turbulence in Molecular Clouds, Colloquium, University of Massachusetts, 14 October 2010
- MHD Turbulence in Molecular Clouds, Colloquium, Boston University, 20 September 2010
- Magnetic Fields in Molecular Clouds in Cosmic Magnetism From Stellar to Intergalactic Scales, 10 June 2010
- MHD Turbulence in Molecular Clouds, Colloquium, University of Rochester, 23 November 2009



- Magnetic Field: Early History, Invited Review in Dense Cores in Dark Clouds LXV, 22 October, 2009
- "Re-Examining the Properties of GMCs in the Milky Way" in Spiral Arm Structure in Nearby Galaxies, Space Telescope Science Institute, Invited talk, 1 October 2009
- Using Gas Motions as a Measure of the Magnetic Field, at JPL Workshop, Testing the Importance of Magnetic Fields in the dynamics of molecular clouds and star formation, 17-19 August, 2009
- "The Physics of Molecular Clouds and Star Formation", series of four invited Lectures at the Naygoya University International Winter School on the Interstellar Medium, 23-27 February 2009
- "Molecular ISM and the SF", invited talk at A Long Walk Through Astronomy: a celebration of the scientific contributions of Luis Carrasco on his 60th Birthday, 15 October 2008
- "Magnetic Fields and Turbulence: Review of Observations", invited review at KITP Conference: Star Formation, Then and Now, 14 August 2007
- "Gas Dynamics in Star Forming Regions, University of Illinois Colloquium, 28 March 2007
- "Turbulence in the Molecular ISM", invited review at IAU 237, Triggered Star Formation in a Turbulent ISM, 14 August 2006
- "Interstellar Turbulence in Molecular Clouds", NRAO Colloquium, 5 April 2007
- "Gas Dynamics in Star Forming Regions, Rice University Colloquium, 25 February 2007
- "Gas Dynamics in Star Forming Regions, University of Massachusetts Colloquium, 17 March 2005
- "Observations of Turbulence in the Molecular Interstellar Medium", IRAM in the ALMA, Herschel Era, Grenoble, France, December 19, 2003
- "Molecular Gas Distribution in the Milky Way", IRAM in the ALMA, Herschel Era, Grenoble, France, December 19, 2003
- "Heterodyne Arrays", Lecturer at the 2nd NAIC/NRAO School on Single-Dish Radio Astronomy Techniques and Applications, Greenbank, WV, 16 August 2003
- "Galactic Plane Surveys at FCRAO", International Union of Radio Science Meeting, Columbus, OH, 22 June 2003
- "Turbulence in the Star-forming Interstellar Medium: Steps toward Constraining Theories with Observations", Magnetic Fields and Star Formation, Madrid, Spain, 21 April 2003
- "The Scientific Mission of the LMT/GTM", Instituto de Astronomia UNAM, Morelia, Mexico, 26 June 2002
- "Turbulence in the Molecular Interstellar Medium", Instituto de Astronomia UNAM, Morelia, Mexico, 26 June 2002
- "Wide Field Imaging of the Outer Galaxy", Boston University, 25 September, 2000
- "Turbulence in the Molecular Interstellar Medium", Kolner Observatorium fur Submillimeter Astronomie, Koln, Germany, 26 May 2000
- "The molecular gas component of M31 and the Milky Way", The interstellar medium in M31 and M33, Bad Honnef, Germany, 22 May, 2000
- "Diagnosing Turbulence in the Interstellar Medium", Harvard-Smithsonian Center for Astrophysics, 26 April 1999
- "The FCRAO CO Survey of the Outer Galaxy", New Perspectives on the Interstellar Medium, Naramata, BC, 23 August, 1998

- "The Kinematic and Spatial Structure of the Molecular Gas Component" New Perspectives on the Interstellar Medium, Naramata, BC, 26 August, 1998
- "The Perseus Spiral Arm of the Galaxy", University of Maryland, 8 April 1998

## Media Appearances

"Milky Way Blues" is a musical composition I created from astronomical data. Following a UMass press release (<https://www.umass.edu/news/article/umass-amherst-astronomer-composes-galactic>) the story was picked up by many news services throughout the world. I gave interviews to the WGBY program Connecting Point (<https://video.rmpbs.org/video/thursday-august-30-2018-flx0pz/>), the CBC Quirks and Quarks podcast

(<https://www.cbc.ca/radio/quirks/july-28-2018-shark-week-is-bad-for-sharks-milky-way-music-climate-change-and-fish-smell-and-more-1.4762432/an-astronomer-turns-the-motions-of-our-milky-way-galaxy-into-sweet-music-1.4762459>), radio stations in San Francisco and Boston (WBZ) and the Voice of America

(<https://www.voanews.com/science-health/does-our-galaxy-sound-funky-blues-music>). As of July 28, 2021, the visualization video has been viewed 116,891 times on YouTube. The visualization video was part of the virtual exhibit "Planetary and Human Health" at the Hosmer Gallery of the Forbes Library in Northampton, MA

(<https://forbeslibrary.org/exhibit2021/>)