

Curriculum Vitae

Qizhou Zhang

Present Address 60 Garden Street, MS 42
Cambridge, MA 02138
E-mail: qzhang@cfa.harvard.edu

Education **Ph.D.** in Astrophysics, Harvard University, December 1996
M.S. in Astrophysics, Harvard University, June 1993
B.S. in Astronomy, Nanjing University, China June 1983

Working Experiences

1998-present Astrophysicist, Harvard-Smithsonian Center for Astrophysics
2002-present Lecturer on Astronomy, Harvard University
Oct. 97-Mar. 98 Jansky Fellow, National Radio Astronomy Observatory
Feb. 97-Sept. 97 Post Doctoral Fellow, Harvard-Smithsonian Center for Astrophysics
1991-1996 Research Assistant, Astronomy Department, Harvard University
1986-1989 Lecturer, Astronomy Department, Nanjing University, China

Fellowships and Awards

- Jansky Fellowship, 1997.
- Advancement Award in Science and Technology, 1987, Chinese National Education Commission.

Grants

- Co-I, Ammonia Galactic Plane Survey (AGPS), NSF China, 2007-2009.
- PI, Outstanding Young Scientist Fund (B), NSF China, 2002-2004.
- PI: Spitzer Space Telescope Cycle 1 proposal, 2004.

Committees

- CfA Prize Committee, 2007-.
- SMA Time Allocation Committee, 2006-2007. Chair, 2007-.
- SMA Legacy Science Committee, 2004-2005.
- CfA Pre Doctoral Fellowship Oversight Committee, 2004-2006.
- Member of the science advisory panel for Chinese National Astronomical Observatories, 2001-.
- CfA Post Doctoral Fellowship Selection Committee, 2002-2004.
- CfA Pre Doctoral Fellowship Selection Committee, 2002-2004.
- SMA Post Doctoral Fellowship Selection Committee, 2001-2006.

Societies

- Member of American Astronomical Society.
- Member of International Astronomical Union.

Professional Activities

- Reviewer for NASA ATP Program, The Chilean Research Fund Council, The Dutch National Science Foundation (NWO), and NSF China grant proposals. Referee for major Astronomical Journal or astronomy journals.
- SOC co-chair, Dome A Science Workshop, 2008.
- SOC co-chair, Astronomy and Chinese Astronomy: Present and Future, 2001.
- SOC member, Site Survey in Western China, 2004.
- LOC chair, Submillimeter Astronomy in the Era of the SMA, 2005.

Teaching Experiences

2004-2008 AY191, Department of Astronomy, Harvard University

Research Highlight

Research on long-term solar brightness changes (Zhang et al. 1994) was cited and presented in details in:

1. United Nations's Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report, 1996, pp 116-117
2. The Atmospheric Sciences Entering the Twenty-First Century: National Academy of Sciences Report, 1998, P 271

Student Research

1. Laura Gomez, visiting PhD Student, 2009
2. Ke Wang, PhD student (SAO predoctoral program), 2008-
3. Javier Rodon, visiting PhD Student, 2008
4. Roberto Galvan-Madrid, PhD student (SAO predoctoral program, co-advisor: Paul Ho), 2007-present
5. Cassandra Fallscheer, visiting PhD student, 2007
6. Gemma Busquet, visiting PhD student, 2007

7. Keping Qiu, PhD student (SAO predoctoral program), 2006-
8. Yang Wang, PhD student (SAO predoctoral program), 2003-2006
9. Peter Sollins, PhD student (Harvard, co-advisor: Paul Ho), 2002-2006
10. Junzhi Wang, PhD student (SAO predoctoral program), 2002-2005
11. Yuan Chen, Master student (Harvard), 2002-2005
12. Stephanie Wang, summer student, 2009
13. Furgan Fazal, summer student, 2007
14. Mark Kramer, summer student, 2000
15. Paul Hamilton, Junior research at Harvard, 2000.
16. Naveen Reddy, summer student, 1999.
17. Beth Lindsey, summer student, 1998

Publications in Refereed Journals by Qizhou Zhang

1. Rotational Structure and Outflow in the Infrared Dark Cloud 18223-3, Fallscheer, C., Beuther, H., **Zhang, Qizhou**, Keto, E., Sridharan, T. K., 2009, accepted to *Astronomy and Astrophysics*
2. Magnetic Fields in the Formation of Massive Stars, Girart, Josep M., Beltran, Maria T., **Zhang, Qizhou**, Rao, Ramprasad, Estalella, Robert, *Science*, 2009, 324, 1408
3. Rotation and Outflow motions in the very low-mass Class 0 protostellar system HH 211 at subarcsecond resolution, Lee, Chin-Fei, Hirano, Naomi, Palau, Aina, Ho, Paul T. P., Bourke, Tyler L., **Zhang, Qizhou**, Shang, Hsien, 2009, *Astrophysical Journal*, 699, 1584
4. Linking pre- and proto-stellar objects in the intermediate-/high-mass star forming region IRAS 05345+3157, Fontani, F., **Zhang, Qizhou**, Caselli, P., Bourke, T. L., 2009, *Astronomy and Astrophysics*, 499, 233
5. Fragmentation at the Earliest Phase of Massive Star Formation, **Zhang, Qizhou**, Wang, Yang, Pillai, Thushara, Rathborne, Jill, 2009, *Astrophysical Journal*, 696, 268
6. Submillimeter Array Observations of the Molecular Outflow in High-mass Star-forming Region G240.31+0.07, Qiu, Keping, **Zhang, Qizhou**, Wu, Jingwen, Chen, Huei-Ru, 2009, *Astrophysical Journal*, 696, 66
7. Chemical Diversity in High-Mass Star Formation, Beuther, H., **Zhang, Qizhou**, Bergin, E. A., Sridharan, T. K., 2009, *Astronomical Journal*, 137, 406
8. SMA observations of Infrared Dark Clouds: A tale of two cores, Rathborne, J. M., Jackson, J. M., **Zhang, Qizhou**, Simon R. 2008, *Astrophysical Journal*, 689, 1141
9. Spitzer IRAC and MIPS Imaging of Clusters and Outflows in 9 High-mass Star Forming Regions, Qiu, Keping, **Zhang, Qizhou**, Megeath, S Thomas, Gutermuth, Robert A., Beuther, Henrik, Shepherd, Debra S., Testi, L., and De Pree, C. G. 2008, 685, 1005
10. SMA Imaging of CO(3-2) Line and 860 micron Continuum of Arp 220 : Tracing the Spatial Distribution of Luminosity, Sakamoto, Kazushi, Wang, Junzhi, Wiedner, Martina C., Wang, Zhong, Peck, Alison B., **Zhang, Qizhou**, Petitpas, Glen R., Ho, Paul T. P., Wilner, David J. 2008, *Astrophysical Journal*, 684, 957
11. ATCA 3mm observations of NGC6334I and I(N): dense cores, outflows and an UCHII region, Beuther, H., Walsh, A. J., Thorwirth, S., **Zhang, Qizhou**, Hunter, T. R., Megeath, S. T., and Menten, K. M. 2008, *Astronomy and Astrophysics*, 481, 169
12. Observations of the Infrared Dark Cloud G28.34+0.06, Wang, Y., **Zhang, Q.**, Pillai, T., Wyrowski, F., and Wu Y. 2008, *Astrophysical Journal*, 672, L33.
13. The Early Evolution of Massive Stars: Radio Recombination Line Spectra, Keto, Eric, **Zhang, Qizhou**, and Kurtz Stanley, 2008, *Astrophysical Journal*, 672, 423.

14. Multi-line (sub)millimetre observations of the high-mass proto cluster IRAS 05358+3543, Leurini, S., Beuther, H., Schilke, P., Wyrowski, F., **Zhang Q.** and Menten, K.M., 2007, *Astronomy and Astrophysics*, 475, 925.
15. The Outflow from the Luminous Young Stellar Object IRAS 20126+4104: From 4000 AU to 0.4 pc, Su, Yu-Nung, Liu, Sheng-Yuan, Chen, Huei-Ru, **Zhang, Qizhou**, and Cesaroni, Riccardo, 2007, *Astrophysical Journal*, 671, 571.
16. An evolved disk surrounding the massive main sequence star MWC 297?, Manoj, P., Ho, Paul T. P., Ohashi, Nagayoshi, **Zhang, Qizhou**, Hasegawa, T., Chen, Huei-Ru, Bhatt, H. C., and Ashok, N. M. 2007, *Astrophysical Journal*, 667, L187.
17. Submillimeter arcsecond-resolution mapping of the highly collimated protostellar jet HH 211, Lee, Chin-Fei, Ho, Paul T.P., Palau, Aina, Hirano, Naomi, Bourke, Tyler L., Shang, Hsien, and **Zhang Qizhou**, 2007, *Astrophysical Journal*, 670, 1188.
18. The 10⁵ Lsun High-Mass Protostellar Object IRAS23151+5912, Beuther, H., **Zhang, Q.**, Hunter, T.R., Sridharan, T.K., and Bergin, E.A., 2007, *Astronomy and Astrophysics*, 493, 493.
19. Jet-like Outflow toward the High-Mass (Proto)stellar Object IRAS 18566+0408, **Zhang, Qizhou**, Sridharan, T. K., Hunter, T. R., Chen, Yuan, Beuther, Henrik, and Wyrowski, Friedrich, 2007, *Astronomy and Astrophysics*, 470, 269.
20. Dust and gas emission in the prototypical hot core G29.96-0.02 at sub-arcsecond resolution, Beuther, H., **Zhang, Q.**, Bergin, E.A., Sridharan, T. K., Hunter, T. R., and Leurini, S. 2007, *Astronomy and Astrophysics*, 468, 1045.
21. SMA Observations Of 321 GHz Water Maser Emission in Cepheus-A, Patel, Nimesh A., Curiel, Salvador, **Zhang, Qizhou**, Sridharan, T.K., Ho, Paul T. P. and Torrelles, Jose M., 2007, *Astrophysical Journal*, 658, L55.
22. Interferometric Multi-Wavelength (Sub)millimeter Continuum Study of the Young High-Mass Protocluster IRAS 05358+3543, Beuther, H., Leurini, S, Schilke, P., Wyrowski, F., Menten, K.M. and **Zhang, Q.**, 2007, *Astronomy and Astrophysics*, 466, 1065.
23. Hot Ammonia in NGC6334I & I(N) , Beuther, H., Walsh, A., Thorwirth S., **Zhang, Q.**, Hunter T. R., Megeath, S.T., Menten, K.M., 2006, *Astronomy and Astrophysics*, 466, 989.
24. PROSAC: A Submillimeter Array Survey of Low-Mass Protostars I. Overview of Program: Envelopes, Disks, Outflows and Hot Cores, Jorgensen, Jes K., Bourke, Tyler L., Myers, Philip C., Di Francesco, James, van Dishoeck, Ewine F., Lee, Chin-Fei, Ohashi, Nagayoshi, Schoeier, Fredrik Takakuwa, L., Shigehisa, Wilner, David J. and **Zhang, Qizhou**, 2007, *Astrophysical Journal*, 659, 479.
25. HH 212: SMA Observations of a Remarkable Protostellar Jet, Lee, Chin-Fei, Ho, Paul T. P., Beuther, Henrik, Bourke, Tyler L., Hirano, Naomi, Shang, Hsien and **Zhang, Qizhou**, 2007, *Astrophysical Journal*, 659, 499.

26. Star Formation in a Clustered Environment Around the UCHII Region in IRAS 20293+3952, Palau, A., Estalella, Girart, J. M., Ho, P. T. P., **Zhang, Q.**, Beuther, H., 2007, *Astronomy and Astrophysics*, 465, 219.
27. Multiple Jets from the High-Mass (Proto)stellar Cluster AFGL5142, **Zhang, Q.**, Hunter, T. R., Beuther, H., Sridharan, T. K., Liu, S. -Y., Su, Y. -N., Chen, H. -R., and Chen Y., 2007, *Astrophysical Journal*, 658, 1152.
28. 650 GHz Continuum and C18O (6-5) Observations of G240.31+0.07 with the Submillimeter Array, Chen, Huei-Ru, Su, Yu-Nung, Liu, Sheng-Yuan, Hunter, Todd R., Wilner, David J., **Zhang, Qizhou**, Lim, Jeremy, Ho, Paul T. P., Ohashi, Nagayoshi, and Hirano, Naomi, 2007, *Astrophysical Journal*, 654, L87.
29. High Resolution Imaging of Molecular Outflows in Massive Young Stars, Qiu, K., **Zhang, Q.**, Beuther, H., and Yang, J. 2007, *Astrophysical Journal*, 654, 361.
30. Disks around Young O-B (Proto)Stars: Observations and Theory, Cesaroni, R., Galli, D., Lodato, G., Walmsley, C. M., and **Zhang, Q.**, 2007, in *Protostars and Planets V.*, p197.
31. The Role of Disks in the Formation of High-Mass Stars, Cesaroni, R., Galli, D., Lodato, G., Walmsley, C. M., and **Zhang, Q.**, 2006, *Nature*, 444, 703.
32. Water Masers Associated with Infrared Dark Cloud, Wang, Y., **Zhang, Q.**, Rathborne, J. M., Jackson, J., and Wu, Y., 2006, *Astrophysical Journal*, *Astrophysical Journal*, 651, L125.
33. VLA NH₃ Observations of Regions of Massive Star Formation in Protostellar Cores, Wang, Y., Wu, Y., **Zhang, Q.**, Mao, R.-Q., and Miller, M., 2006, *Astronomy and Astrophysics*, 450, 607.
34. Silicon Monoxide Observations Reveal a Cluster of Hidden Compact Outflows in the OMC1 South Region, Zapata, L. A., Ho, P. T. P., Rodriguez, L. F., O'Dell, C. R., Zhang, Q. and Muench, A. 2006, *Astrophysical Journal*, , 653, 398
35. The distribution of SiO in the circumstellar envelope around IRC+10216, Schoeier, F. L. Fong, D., Olofsson, H., **Zhang, Q.**, and Patel, N., 2006, *Astrophysical Journal*, 649, 965.
36. The high-mass star-forming region IRAS18182-1433, Beuther, H., **Zhang, Q.**, Sridharan, T. K., Lee, C.-F., and Zapata, L. A., 2006, *Astronomy and Astrophysics*, 454, 221.
37. Infall and Outflow around the HH 212 Protostellar System, Lee, Chin-Fei, Ho, Paul T. P., Beuther, Henrik, Bourke, Tyler, **Zhang, Qizhou**, Hirano, Naomi and Hsien Shang, 2006, *Astrophysical Journal*, 639, 292.
38. Submillimeter Emission from the Hot Molecular Jet HH211, Palau, A., Ho, P. T. P., **Zhang, Q.**, Estalella, R., Hirano, N., Shang, H., Lee, C.-F., Bourke, T. L., Beuther, H., and Kuan Y.-J., 2006, *Astrophysical Journal*, 636, L137.
39. SiO J=5-4 in the HH211 Protostellar Jet Imaged with the SMA, Hirano, Naomi , Liu, Sheng-Yuan, Shang, Hsien, Ho, Paul T. P., Huang, Hui-Chun , Kuan, Yi-Jehng, McCaughrean, Mark J. and **Zhang, Qizhou**, 2006, *Astrophysical Journal*, 636, L141.

40. In Search of Circumstellar Disks around Young Massive Stars, Zapata, Luis A., Rodriguez, Luis F. , Ho, Paul T. P., Beuther, Henrik, and **Zhang, Qizhou**, 2006, *Astronomical Journal*, 131, 939.
41. NH₃ cores in high-mass star formation regions, Wu, Yuefang, **Zhang, Qizhou**, Yu, Wentao, Miller, Martin, Mao, Ruiqing, Sun, Kefong and Wang, Yang, 2006, *Astronomy and Astrophysics*, 450, 607.
42. Submillimeter Array 440 μ m/690GHz Line and Continuum Observations of Orion-KL, Beuther, H., **Zhang, Q.**, Reid, M. J., Hunter, T. R., Greenhill, L .J., Gurwell, M., Wilner, D. J., Zhao, J-H, Shinnaga, H., Keto, E., Ho, P. T. P., Moran, J. M. and Liu, S.-Y., 2006, *Astrophysical Journal*, 636, 323.
43. A Highly Collimated, Young and Fast CO (2-1) Outflow in OMC1 South, Zapata, L. A., Rodriguez, L. F., Ho, P. T. P., **Zhang, Q.**, Qi, C. and Kurtz, S. E., 2005, *Astrophysical Journal*, 630, L85.
44. A Disk of Dust and Molecular Gas around a High-mass Protostar, Patel, N. A., Curiel, S., Sridharan, T. K., **Zhang, Q.**, Hunter, T. R., Ho, T. P. T., Torrelles, T. M., Moran, J. M., Gomez, J. F. and Anglada, G., 2005, *Nature*, 437, 1038.
45. Submm Line Imaging of Orion-KL at 865 μ m with the Submillimeter Array, Beuther, H., **Zhang, Q.**, Greenhill, L .J., Reid, M. J., Wilner, D. J., Keto, E., Shinnaga, H., Ho, P. T. P., Moran, J. M., Liu, S.-Y. and Chang, C.-M., 2005, *Astrophysical Journal*, 632, 355.
46. An Infalling Torus of Molecular Gas Around the Ultra-Compact HII Region G28.20-0.05, Sollins, Peter, K., **Zhang, Qizhou**, Keto, Eric and Ho, Paul. T. P. 2005, *Astrophysical Journal*, 631, 399.
47. Discovery of a Massive SCUBA Core with Both Inflow and Outflow Motions, Wu, Yuefang, Zhu, Ming, Wei, Yue, Xu, Dandan, **Zhang, Qizhou** and Fiege, Jason D. 2005, *Astrophysical Journal*, 628, L57.
48. Spherical Infall in G10.6-0.4: Accretion through an Ultracompact HII region, Sollins, Peter, K., **Zhang, Qizhou**, Keto, Eric and Ho, Paul. T. P. 2005, *Astrophysical Journal*, 624, 49.
49. Search for CO Outflows toward a Sample of 69 High-Mass Protostellar Candidates II: Outflow Properties, **Zhang, Q.**, Hunter, T. R., Brand, J., Sridharan, T. K., Cesaroni, R., Molinari, S., Wang, J., Kramer, M. A. 2005, *Astrophysical Journal*, 625, 864.
50. Testing the massive disk scenario for IRAS 18089-1732, Beuther, H., **Zhang, Q.**, Sridharan, T. K. and Chen, Y. 2005, *Astrophysical Journal*, 628, 800.
51. High-spatial resolution observations of NH₃ and CH₃OH towards the massive twin cores NGC6334 I & I(N), Beuther, H., Thorwirth, S., **Zhang, Q.**, Hunter, T.R. , Megeath, S.T., Walsh, A.J. and Menten K.M. 2005, *Astrophysical Journal*, 627, 834.
52. CO J = 2-1 Maps of Bipolar Outflows in Massive Star-forming Regions, Wu, Y. **Zhang, Q.**, Chen, H., Yang, C., and Ho, P. T. P., 2005, *Astronomical Journal*, 129, 330.

53. Sub-arcsecond Sub-mm Continuum Observations of Orion-KL, Beuther, H., **Zhang, Q.**, Greenhill, L. J., Reid, M. J., Wilner, D., Keto, E., Marrone, D., Ho, P. T. P., Moran, J. M., Rao, R., Shinnaga, H. and Liu, S.-Y. 2004, *Astrophysical Journal*, 616, L31.
54. Organic Molecules in Low-Mass Protostellar Hot Cores: Submillimeter Imaging of IRAS 16293-2422, Kuan, Yi-Jehng, Huang, Hui-Chun, Charnley, S. B., Hirano, N., Takakuwa, S., Wilner, D. J., Liu, Sheng-Yuan, Ohashi, N., Bourke, T. L.; Qi, C., and **Zhang, Qizhou** 2004, *Astrophysical Journal*, 616, L27.
55. High Velocity Bipolar Outflow and Disk-like Envelopes in the Carbon Star V Hya, Hirano, N., Shinnaga, H., Dinh-V-Trung, Fong, D., Keto, E., Patel, N., Qi, C., Young, K., **Zhang, Q.**, and Zhao, J. 2004, *Astrophysical Journal*, 616, L43.
56. Imaging the Disk around TW Hya with the Submillimeter Array, Qi, C., Ho, Paul T. P., Wilner, D. J.; Takakuwa, S.; Hirano, N., Ohashi, N., Bourke, T. L., **Zhang, Qizhou**, Blake, G. A., Hogerheijde, M., Saito, M., Choi, M., and Yang, J, 2004, *Astrophysical Journal*, 616, L11.
57. Submillimeter Array Observations of L1551 IRS 5 in CS (J=7-6), Takakuwa, S., Ohashi, N., Ho, Paul T. P., Qi, C., Wilner, D. J., **Zhang, Qizhou**, Bourke, T. L., Hirano, N., Choi, M., and Yang, J. 2004, *Astrophysical Journal*, 616, L15.
58. Warm Molecular Gas in Galaxy-Galaxy Merger NGC6090, Wang, Junzhi, **Zhang, Qizhou**, Wang, Zhong, Ho, Paul T. P., Fazio, G. G., and Wu, Yuefang 2004, *Astrophysical Journal*, 616, L67.
59. In Search of Calibrators at the Submillimeter Band for the Submillimeter Array: I Ultra-compact HII-regions, Su, Y.-N., Liu, S.-Y., Lim, J., Ohashi, N., Beuther, H., **Zhang, Q.**, Sollins, P., Hunter, T., Sridharan, T. K., Zhao, J.-H. and Ho, P. T. P. 2004, *Astrophysical Journal*, 616, L39-L42.
60. SMA Outflow/Disk Studies in the Massive Star-Forming Region IRAS18089-1732, Beuther, H., Hunter, T. R., **Zhang, Q.**, Sridharan, T. K., Zhao, J.-H., Sollins, P., Ho, P. T. P., Ohashi, N., Su, Y. N., Lim, J., and Liu, S.-Y. 2004, *Astrophysical Journal*, 616, L23.
61. SMA Multi-Line Observations of the Massive Star-Forming Region IRAS18089-1732, Beuther, H., **Zhang, Q.**, Hunter, T. R., Sridharan, T. K., Zhao, J.-H., Sollins, P., Ho, P. T. P., Liu, S.-Y., Ohashi, N., Su, Y. N. and Lim, J. 2004, *Astrophysical Journal*, 616, L19.
62. Mapping the Outflow from G5.89-0.39 in SiO J=5-4, Sollins, P. K., Hunter, T. R., Battat, J., Beuther, H., Ho, P. T. P., Lim, J., Liu, S. Y., Ohashi, N., Sridharan, T. K., Su, Y. N., Zhao, J.-H., and **Zhang, Q.** 2004, *Astrophysical Journal*, 616, L35-L38.
63. IRAS 18317-0757: A Cluster of Embedded Massive Stars and Protostars, Hunter, T. R., **Zhang, Q.** and Sridharan, T. K. 2004, *Astrophysical Journal*, 606, 929.

64. The Core-Outflow Structure in Two Massive Proto-stellar Candidates: IRAS 21307+5049 and IRAS 22172+5549, Fontani, F., Cesaroni, R., Testi, L., Molinari, S., **Zhang, Q.**, Brand, J., and Walmsley, C. M., 2004, *Astronomy and Astrophysics*, 424, 179.
65. A Case for Local Collapse in the W51 Star Forming Region, Sollins, Peter, K., **Zhang, Qizhou** and Ho, Paul. T. P., 2004, *Astrophysical Journal*, 606, 943.
66. Bipolar Molecular Outflows from High-Mass Protostars, Su, Yu-Nung, **Zhang, Qizhou** and Lim Jeremy, 2004, *Astrophysical Journal*, 604, 258.
67. IRAS 23385+6053: A Candidate Protostellar Massive Object, Fontani, F., Cesaroni, R., Testi, L., Walmsley, C. M., Molinari, S., Neri, R., Shepherd, D., Brand, J., Palla, F., and **Zhang, Q.**, 2004, *Astronomy and Astrophysics*, 414, 299.
68. The Formation of Massive Stars. I. High Resolution Millimeter and Radio Studies of High-Mass Protostellar Candidates, Molinari, S., Testi, L. Rodriguez L. R. and **Zhang, Q.**, 2002 *Astrophysical Journal*, 570, 758.
69. A Disk/Jet System toward the High-mass Young Star in AFGL 5142, **Zhang, Q.**, Hunter, T. R., Sridharan, T. K., and Ho, P. T. P., 2002, *Astrophysical Journal*, 566, 982.
70. Search for CO Outflows toward a Sample of 69 High-mass Protostellar Candidates: Frequency of occurrence, **Zhang, Qizhou**, Hunter, T. K., Brand, J., Sridharan, T. K., Molinari, S., Kramer, M. A., and Cesaroni, R., 2001, *Astrophysical Journal*, 552, L167.
71. Multi-field Mosaic of the NGC 7538 Region, Zheng, X-W, **Zhang, Qizhou**, Ho, Paul T. P., and Pratap, Preethi, 2001, *Astrophysical Journal*, 550, 301.
72. Proper Motion of Water Masers Associated with IRAS 21391+5802: Bipolar Outflow and an AU-scale Dusty Circumstellar Shell, Patel, N, A., Greenhill, L. J., Herrnstein, J., **Zhang, Q.**, Moran, J. M., Ho, P. T. P. and Goldsmith, P. F., 2000, *Astrophysical Journal*, 538, 268.
73. The SiO and CS Emission in the Molecular Outflow toward L1157, **Zhang, Q.**, Ho, P. T. P. and Wright, M. C. H., 2000, *Astronomical Journal*, 119, 1345.
74. Shock Heated NH₃ in a Molecular Jet Associated with a High-mass Young Star, **Zhang, Q.**, Hunter, T. R., Sridharan, T. K., and Cesaroni, R., 1999, *Astrophysical Journal*, 527, L117.
75. The Protostellar Outflow from IRAS 20126+4104 in CO(J=7-6), Kawamura, J.H., Hunter, T.R. , Tong, C.-Y.E., Blundell, R., **Zhang, Q.**, Katz, C., Papa, D. C. and T.K. Sridharan, 1999, *PASP*, 111, 1088.
76. Molecular Jets and H₂O Masers in the AFGL 5142 Hot Core, Hunter, T. R., Testi, L., **Zhang, Q.** and Sridharan, T. K., 1999, *Astronomical Journal*, 118, 477.
77. A Rotating Disk around A High-mass Young Star, **Zhang, Q.**, Hunter, T. R. and Sridharan, T. K., 1998, *Astrophysical Journal*, 505, L151.

78. Dynamical Collapse in W51 Massive Cores: CS(3-2) and CH₃CN Observations, **Zhang, Q.**, Ho, P. T. P. and Ohashi, N., 1998, *Astrophysical Journal*, 494, 636.
79. Dynamical Collapse in W51 Massive Cores: NH₃ Observations, **Zhang, Q.** and Ho, P. T. P., 1997, *Astrophysical Journal*, 488, 241.
80. Isotopic CO Images near Young Triple Star GSS30, **Zhang, Q.**, Wootten, A. and Ho, P. T. P., 1997, *Astrophysical Journal*, 475, 713.
81. Search for Infall: Aperture Synthesis HCO⁺ and SiO(2-1) Observations of G45.47+0.05 Region, Wilner, D. J., Ho, P. T. P. and **Zhang, Q.**, 1996, *Astrophysical Journal*, 462, 339.
82. SiO Emission in a Jet-like Outflow toward L1157, **Zhang, Q.**, Ho, P. T. P., Wright, M. C. H. and Wilner, D. J., 1995, *Astrophysical Journal*, 451, L72.
83. Ammonia Maser in a Molecular Outflow toward W51, **Zhang, Q.** and Ho, P. T. P., 1995, *Astrophysical Journal*, 450, L63.
84. Chromospheric Variations in Main-sequence Stars II, Baliunas et al., 1995, *Astrophysical Journal*, 438, 269.
85. A Method of Determining Possible Brightness Variations of the Sun in Past Centuries from Observations of Solar-type Stars, **Zhang, Q.**, Soon, W. H., Baliunas, S. L., Lockwood, G. W., Skiff, B. A. and Radick, R. R., 1994, *Astrophysical Journal*, 427, L111.
86. Long-term Surface Activity of the Sun and Solar-type Stars, Soon, W. H., Baliunas, S. L. and **Zhang, Q.**, 1994, *Solar Physics*, 154, 385.
87. A Technique for Estimating Long-term Variations of Solar Total Irradiance: Preliminary Estimates Based on Observations of the Sun and Solar-type Stars, Soon, W. H., Baliunas, S. L. and **Zhang, Q.**, in *The Solar Engine and Its Influence on Terrestrial Atmosphere and Climate* (NATO, Advanced Research Workshop Series: Springer-Verlag), Ed. E. Nesme-Ribes (Heidelberg), 133 (1994).
88. The Mount Wilson Observatory Metallicity Index, C_{rv} : Comparison to Other Photometric Systems, Soon, W. H., **Zhang, Q.**, Baliunas, S. L. and Kurucz, R. L. 2003, *Astrophysical Journal*, 417, 488.
89. An Interpretation of Cycle Periods of Stellar Chromospheric Activity, Soon, W. H., Baliunas, S. L. and **Zhang, Q.**, 1993, *Astrophysical Journal*, 414, L33.
90. Spectral analysis of the Oct 1984 prominence II, Hu, J., **Zhang, Q.**, Fang, C. and Ye, S., 1990, *ACT. Astrophys. Sin.*, 14, 262.
91. A Comparison Between the Non-LTE Radiative Transfer with the Complete Linearization Treatment, **Zhang, Q.**, Fang, C., 1990, *Publ. of Nanjing University*, 15, 135 .
92. Spectral Analysis of the Oct 1984 Prominence I, Hu, J., **Zhang, Q.**, Fang, C. and Ye, S., 1988, *Publ. of Purple Mountain Obs.*, 7, 45.

93. Height-varying Semi-empirical Models of a Quiescent Prominence, Fang, C., **Zhang, Q.**, Yin, S., and Livingston, W. C., 1988, *Scientia Sinica (A)*, 4, 413.
94. Spectral Analysis and the Two-dimensional Distribution of Physical Parameters in a Quiescent Prominence, **Zhang, Q. Z.**, Hu, J., Fang, C. and Livingston, W. C., 1987, *Solar Physics*, 144, 245.
95. Non-LTE Radiative Transfer and Semi-empirical Models of a Quiescent Prominence, **Zhang, Q.** and Fang, C., 1987, *Astronomy and Astrophysics*, 175, 277.
96. Two-dimensional Distributions of Physical Parameters in the Prominence of 1984 March 23, **Zhang, Q.** and Fang, C., 1987, *Chin. Astron. Astrophys.*, 11, 215.
97. Application of the Complete Linearization Method to the Analysis of Solar Prominence Emission Spectra, **Zhang, Q.** and Fang, C., 1986, *Chin. Astron. Astrophys.*, 10, 324.

Publications in Conference Proceedings by Qizhou Zhang

1. Massive Star Disks (Invited Review), Zhang, Q., in proceedings for IAU Symposium 227, Massive star birth: A crossroads of Astrophysics, 2005, p135.
2. Early Results from the SMA (Invited Review), Zhang, Q., in proceedings for IAU Symposium 221, Star Formation at High Angular Resolution, 2003.
3. Search for Disks and Outflows in High-Mass Protostellar Candidates: Implication for Formation Mechanism, Zhang, Q., in *The Earliest Phases of Massive Star Birth*, ASP Conf. Proc., Ed. P. A. Crowther, 2001.
4. Bipolar Molecular Outflows from High-Mass Protostars, Su, Y. N., Zhang, Q., and Lim, J., in *The Earliest Phases of Massive Star Birth*, ASP Conf. Proc., Ed. P. A. Crowther, 2001.
5. New Observations of W51 in H^{13}CO^+ (J=1-0): Evidence of a New Outflow, Sollins, P. K., Zhang, Q., Ho, P. T. P., in *The Earliest Phases of Massive Star Birth*, ASP Conf. Proc., Ed. P. A. Crowther, 2001.
6. A Disk/Outflow System around the High-mass Young Star IRAS 20126+4104, Zhang, Q., Hunter, T. R., Sridharan, T. K. and J. H. Kawamura, in *Science with the Atacama Large Millimeter Array*, ASP Conf. Proc., Ed. A. Wootten, 1999.
7. Proper Motion of Water Masers in IRAS 21391+5802: Bipolar Outflow and a Dusty Circumstellar Shell, Patel, N. A., Greenhill, L. J., Herrnstein, J., Zhang, Q., Moran, J. M., Ho, P. T. P. and Goldsmith, P. F., in *Science with the Atacama Large Millimeter Array*, ASP Conf. Proc., Ed. A. Wootten, 1999.
8. A Disk/Outflow System around A High-mass Young Star, Zhang, Q., Hunter, T. R., and Sridharan, T. K., in *Star Formation 1999*, Ed. T. Nakamoto, 1999, 225.

9. Proper Motion of Water Masers Associated with IRAS 21391+5802, Patel, N, A., Greenhill, L. J., Herrnstein, J., Zhang, Q., Moran, J. M., Ho, P. T. P. and Goldsmith, P. F., in *Star Formation 1999*, Ed. T. Nakamoto, 1999, 300.
10. A CO J=2-1 Mapping Study for Molecular Outflows near Massive Young Stellar Objects, Wu, Y., Zhang, Q., Chen, H., Yang, C., and Ho, P. T. P., in *Imaging through Radio to submillimeter Wavelengths*, ASP Conf. Proc., Ed. J. Mangum, 1999.
11. A Peculiar Jet-like Molecular Outflow toward L1157, Zhang, Q., Ho, P. T. P., Wright, M. C. H. and Wilner, D. J., in *Low Mass Star Formation from Infall to Outflow*, IAU 182, Ed. F. Malbet and A. Castets, 1997, 195.
12. Star Formation at Intermediate Distances: Gravitational Collapse in Massive Cores, Zhang, Q. and Ho, P. T. P., in *Star Formation Near and Far*, AIP Conf. Proc. 393, Ed. S. Holt and L. G. Mundy, 1996, 453.
13. Ammonia Masers Associated with Massive Star Formation toward W51, Zhang, Q. and Ho, P. T. P., in *Cloud, Cores, and Low Mass Stars*, A.S.P. Conf. Ser. 65, Ed. D. P. Clements and R. Barvainis, 1994, 304.
14. Semiempirical Models for a Quiescent Prominence, Fang, C., Zhang, Q., Yin, S., and Livingston, W. C., in *Dynamics of Quiescent Prominences*, IAU Coll 117, Eds V. Ruzdjak and E. Tandberg-Hanssen, 1990, 284.

Talks in Conferences/Worshops by Qizhou Zhang

1. “Centimeter to Sub-millimeter Views of Disks” in conference ‘Massive Star Formation, Observations Confront Theory’ (Sept. 2007), **Invited**.
2. “Science from the SMA”, in international workshop ‘Legacy of Multi-wavelength Surveys’ (Aug. 2007), **Invited**.
3. “Observations of disks associated with high-mass young stars”, in workshop ‘Transformational Science with ALMA: Through Disks to Stars and Planets’ (June 2007).
4. “Massive Star Disks”, at IAU Symposium 227 ‘Massive star birth: A crossroads of Astrophysics’ (May 2005), **Invited**.
5. “Early Results from the SMA”, at IAU Symposium 221 ‘Star Formation at High Angular Resolution’ (July 2003), **Invited**.
6. “Massive Star Formation and the SMA”, at Magnetohydrodynamics, Radiation Diagnostics, and Chemistry of Star Formation, Taiwan (June 2002), **Invited**.
7. “Massive Star Formation: Many Unsolved Mysteries”, at Astronomy and Chinese Astronomy: Present and Future, Beijing, China (December 2001), **Invited**.
8. “Formation of High-Mass Stars: Coalescence or Accretion?”, ATNF Colloquium, Australia (December 2001).

9. “Disks and Outflows toward High-mass Protostellar Candidates”, at The Third Boulder Hot Star Workshop: The Earliest Phases of Massive Star Birth, Boulder, Colorado (August 2001).
10. “High-mass Star Formation: Coalescence vs. Accretion”, Colloquium at IfA, University of Hawaii (June 2001).
11. “Infall and Disk around High-mass Stars”, at High-Mass Star Formation: An Origin in Clusters, Volterra, Italy (June 2000).
12. “High-Mass Star Formation”, at Prospects in Astronomy and Astrophysics in the New Millennium, Taiwan (May, 2000).
13. “Dynamic Collapse and Disks in High-mass Star Forming Region”, NRAO Colloquium, Charlottesville, Virginia (February, 1998).
14. “SiO Emission in a Jet-like Molecular Outflow towards L1157”, at the Center for Astrophysics Symposium (June, 1995).
15. “Ammonia Maser and Massive Star Formation toward W51”, at the Center for Astrophysics Symposium (May, 1994).