

JAEHAN BAE

Curriculum Vitae

Department of Terrestrial Magnetism
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EMPLOYMENT

- Postdoctoral Fellow** 09/2017 –
Department of Terrestrial Magnetism, Carnegie Institution for Science,
Washington, DC, USA
- Postdoctoral Fellow** 05/2017 – 08/2017
Department of Astronomy, University of Michigan, Ann Arbor, MI, USA
- Research Associate** 04/2008 – 06/2011
Korea Astronomy and Space Science Institute, Daejeon, South Korea

EDUCATION

- Ph.D. in Astronomy & Astrophysics** 09/2011 – 04/2017
University of Michigan, Ann Arbor, MI, USA
Advisor: Prof. Lee Hartmann
Thesis title: Studies of Young, Star-forming Circumstellar Disks
- M.S. in Astronomy** 03/2006 – 02/2008
Seoul National University, Seoul, South Korea
Advisor: Prof. Woong-Tae Kim
Thesis title: Properties of Interstellar Turbulence Driven by Localized
Explosive Sources
- B.S. in Astronomy with highest GPA** 03/2002 – 02/2006
Seoul National University, Seoul, South Korea
Advisor: Prof. Woong-Tae Kim
Thesis title: Kelvin-Helmholtz Instability in Ionized, Incompressible
Fluids

GRANTS AND AWARDS

- Vera Rubin Postdoctoral Fellowship** 02/2017
Carnegie Institution for Science
- ROSES-2016 Emerging Worlds (\$180,000, PI: Hartmann)** 12/2016
NASA
- Rackham Graduate Student Research Grant (\$3,000)** 09/2016
University of Michigan
- Rackham Dissertation Fellowship** 05/2016
University of Michigan
- Rackham Conference Travel Grant (\$558, \$1,050, \$800)** 2015, 2016, 2017
University of Michigan
- Astronomy Preview Weekend Poster Prize Winner** 11/2015
University of Michigan
- BK Research Fellowship** 03/2006 – 02/2008
National Research Foundation of Korea

Undergraduate Scholarship for Academic Excellence
Seoul National University

03/2002 – 02/2006

PUBLICATIONS

17 published/accepted papers (11 as first author), 1 papers in revision, 228 total citations as of Feb. 16, 2018

Source: SAO/NASA ADS ([link](#))

First Author

12. **Bae, J.**, & Zhu, Z., “Planet-driven Spiral Arms in Protoplanetary Disks: II. Implications”, 2017, submitted to *The Astrophysical Journal* [ADS]
11. **Bae, J.**, & Zhu, Z., “Planet-driven Spiral Arms in Protoplanetary Disks: I. Formation Mechanism”, 2017, accepted to *The Astrophysical Journal* [ADS]
10. **Bae, J.**, Zhu, Z., & Hartmann, L., “On the Formation of Multiple Concentric Rings and Gaps in Protoplanetary Disks”, 2017, *The Astrophysical Journal*, 850, 201 [ADS]
9. **Bae, J.**, Nelson, R. P., & Hartmann, L., “The Spiral Wave Instability Induced by a Giant Planet: I. Particle Stirring in the Inner Regions of Protoplanetary Disks”, 2016, *The Astrophysical Journal*, 833, 126 [ADS]
8. **Bae, J.**, Nelson, R. P., Hartmann, L., & Richard, S., “Self-destructing Spiral Waves: Global Simulations of a Spiral-wave Instability in Accretion Disks”, 2016, *The Astrophysical Journal*, 829, 13 [ADS]
7. **Bae, J.**, Zhu, Z., & Hartmann, L., “Planetary Signatures in the SAO 206462 (HD 135344B) Disk: A Spiral Arm Passing Through Vortex?”, 2016, *The Astrophysical Journal*, 819, 134 [ADS]
6. **Bae, J.**, Hartmann, L., & Zhu, Z., “Are Protoplanetary Disks Born With Vortices? – Rossby Wave Instability Driven by Protostellar Infall”, 2015, *The Astrophysical Journal*, 805, 15 [ADS]
5. **Bae, J.**, Hartmann, L., Zhu, Z., & Nelson, R. P., “Accretion Outbursts in Self-gravitating Protoplanetary Disks”, 2014, *The Astrophysical Journal*, 795, 61 [ADS]
4. **Bae, J.**, Hartmann, L., Zhu, Z., & Gammie, C., “The Long-term Evolution of Photoevaporating Protoplanetary Disks”, 2013, *The Astrophysical Journal*, 774, 57 [ADS]
3. **Bae, J.**, Hartmann, L., Zhu, Z., & Gammie, C., “Variable Accretion Outbursts in Protostellar Evolution”, 2013, *The Astrophysical Journal*, 764, 141 [ADS]
2. **Bae, J.-H.**, Kim, K.-T., Yoon, S.-Y., et al., “A Multi-Epoch, Simultaneous Water and Methanol Maser Survey Toward Intermediate-Mass Young Stellar Objects”, 2011, *The Astrophysical Journal Supplement Series*, 196, 21 [ADS]
1. **Bae, J.-H.**, & Byun, D.-Y., “Analysis of KVN 21m Radio Antenna Optics using Ray-Tracing Method”, 2009, *Journal of Astronomy and Space Sciences*, 26, 187 [ADS]

Co-Author

6. Hartmann, L., & **Bae, J.**, “How do T Tauri Stars Accrete?”, 2018, *Monthly Notices of the Royal Astronomical Society*, 474, 88 [ADS]

5. Herczeg, G. J., Johnstone, D., Mairs, S., et al., “How do stars gain their mass? A JCMT/SCUBA-2 Transient Survey of Protostars in Nearby Star Forming Regions”, 2017, *The Astrophysical Journal*, 849, 43 [ADS]
4. Niinuma, K., Lee, S.-S., Kino, M., et al., “VLBI Observations of Bright AGN Jets with the KVN and VERA Array (KaVA): Evaluation of Imaging Capability”, 2014, *Publications of the Astronomical Society of Japan*, 66, 103 [ADS]
3. Matsumoto, N., Hirota, T., Sugiyama, K., et al., “The First Very Long Baseline Interferometry Image of a 44 GHz Methanol Maser with the KVN and VERA Array (KaVA)”, 2014, *The Astrophysical Journal*, 789, 1 [ADS]
2. Lee, S.-S., Byun, D.-Y., Oh, C. S., et al., “Single-Dish Performance of KVN 21 m Radio Telescopes: Simultaneous Observations at 22 and 43 GHz”, 2011, *Publications of the Astronomical Society of Pacific*, 123, 1398 [ADS]
1. Kim, K.-T., Byun, D.-Y., Je, D.-H., et al., “100-GHz Band Test Observations of the KVN 21 m Radio Telescopes”, 2011, *Journal of the Korean Astronomical Society*, 44, 81 [ADS]

RESEARCH INTERESTS

protoplanetary disks, planet-disk interaction, hydrodynamic/magnetohydrodynamic instabilities, planet formation, accretion disks, FU Orionis objects, exoplanets

ACCEPTED COMPUTATION PROPOSALS

NASA Pleiades	10/2017
“Propagating Spiral Waves in Protoplanetary Disks”, Co-I (PI: Hartmann), 24,250 Service Units	
XSEDE Research Allocation	03/2017
“Three-dimensional Local Isothermal Hydrodynamic Simulations of the Spiral Wave Instability in Astrophysical Disks” Co-I (PI: Hartmann), 22,365 GPU hours on XStream	
NASA Pleiades	01/2017
“Propagating Spiral Waves in Protoplanetary Disks” Co-I (PI: Hartmann), 400,000 Service Units	
XSEDE Startup Allocation	09/2015
“Investigating Protostellar Accretion Outbursts in Three Dimensions” Co-I (PI: Hartmann), 150,000 Service Units	

ACCEPTED OBSERVATION PROPOSALS

Gemini Large Program	06/2016
“Scattered Light Imaging of YSOs: Probing the Fundamental Stages of Planet Formation”, Co-I (PI: Monnier)	
JCMT Survey	11/2015
“A Transient Search for Variable Protostars: How Do Stars Gain Their Mass?”, Co-I (PI: Herczeg)	
ALMA Cycle 3	08/2015
“Searching for Infall-Disk Interactions in HL Tau”, PI: Bae	

OBSERVING EXPERIENCE

MDM Observatory	03/2012
Spectroscopic monitoring of AGNs, 6 nights	
Korean VLBI Network	06/2009 – 04/2011
Water and methanol maser survey of young stellar objects, 50+ nights	
Seoul Radio Astronomy Observatory	04/2009
Molecular line survey of young stellar objects, 4 nights	

TEACHING/MENTORING EXPERIENCE

Research Advisor	Fall 2015
Co-advised an undergraduate research project with Prof. Lee Hartmann	
Graduate Student Instructor	Fall 2015
Led two Astro 361 (Astronomical Techniques) lab sections	
Graduate Student Instructor	Winter 2012
Led four Astro 101 (Introductory Astronomy: The Solar System and the Search for Life Beyond Earth) discussion sections	

SOFTWARE DEVELOPMENT EXPERIENCE

Dynamic Observation Scheduler	2010
Designed a Python-based dynamic scheduler for the Korean VLBI Network (KVN), which generates an optimal schedule for observing runs.	
Ray-Tracing Algorithm	2009
Developed a ray-tracing algorithm to test the effects of displacements in the antenna optics on the antenna gain and pointing. The algorithm was used to realign KVN antenna optics.	

PROFESSIONAL SERVICE

Journal Referee	
The Astrophysical Journal, Monthly Notices of the Royal Astronomical Society, Astrophysics and Space Science, Astronomy and Computing	
NASA Exoplanet Research Program External Reviewer	2017
UM Astronomy Undergraduate Poster Competition Panelist	04/2016
UM Astronomy Graduate Student Representative	09/2014 – 08/2015
UM Department Star Formation Journal Club Organizer	09/2014 – 08/2015

OUTREACH

IAU-Sponsored Public Exoplanet Naming Contest	12/2014 – 10/2015
Led a community effort in Ann Arbor, MI, with supports from Ann Arbor Hands-On Museum. We finished in Top 3 for a vote for 51 Pegasi. (ctrl+f to search for ann arbor at http://nameexoworlds.iau.org/statistics)	

PAST AND UPCOMING PRESENTATIONS

Seminar Talk , DTM Seminar, Carnegie DTM, Washington, DC	06/2018
Seminar Talk , Exoplanet, Star and Planet Formation Seminar, STScI, Baltimore, MD	05/2018
Seminar Talk , DTM Support Staff Lunch & Learn, Carnegie DTM, Washington, DC	03/2018
Contributed Talk , Star and Planet Formation in the Southwest, Oracle, AZ	03/2018
Colloquium , University of Wyoming, Laramie, WY	02/2018
Colloquium , Southwest Research Institute, Boulder, CO	02/2018
Seminar Talk , NASA Goddard Extrasolar Planets Seminar, NASA Goddard Space Flight Center, Greenbelt, MD	01/2018
Contributed Talk , 231th American Astronomical Society Meeting, Washington, DC	01/2018
Poster , The origin of galaxies, stars, and planets in the era of ALMA, Caltech, Pasadena, CA	11/2017
Poster , Gordon Research Conference, Mount Holyoke College, South Hadley, MA	06/2017
Contributed Talk , Gordon Research Seminars, Mount Holyoke College, South Hadley, MA	06/2017
Dissertation Talk , 229th American Astronomical Society Meeting, Grapevine, TX	01/2017
Seminar Talk , Harvard/CfA Stars & Planets Seminar, CfA, Boston, MA	11/2016
Seminar Talk , MKI/EAPS Exoplanet Tea, MIT, Boston, MA	11/2016
Seminar Talk , SFIR Seminar, Princeton University, Princeton, NJ	10/2016
Contributed Talk , Workshop on Young Solar Systems, Sant Cugat, Spain	04/2016
Poster , Gordon Research Conference, Mount Holyoke College, South Hadley, MA	06/2015
Contributed Talk , Frontier in Star Formation, University of Michigan, Ann Arbor, MI	06/2015
Poster , Research Computing Symposium, University of Michigan, Ann Arbor, MI	11/2014
Poster , Circumstellar Disks and Planet Formation Conference, University of Michigan, Ann Arbor, MI	10/2014
Colloquium , Korea Astronomy and Space Science Institute, Daejeon, Korea	06/2014
Poster , Research Computing Symposium, University of Michigan, Ann Arbor, MI	11/2013
Poster , Gordon Research Conference, Mount Holyoke College, South Hadley, MA	06/2013
Poster , Star Formation through Spectroimaging at High Angular Resolution, ASIAA, Taipei, Taiwan	06/2011
Contributed Talk , Korean Astronomical Society Meeting, Chungbuk National University, Cheongju, Korea	04/2011
Contributed Talk , Korean Astronomical Society Meeting, Kyung-Ju, Korea	04/2008