

Jeffrey Gary Mangum, Ph.D.

✉ jeff.mangum@nrao.edu

✂ @JeffreyGMangum

🦋 @JeffreyGMangum.bsky.social

🌐 <https://sites.google.com/view/jeffmangum/>



Employment History

- 2013 – **Editor-in-Chief**, Publications of the Astronomical Society of the Pacific (PASP)
- 1995 – **Scientist**, National Radio Astronomy Observatory
- 1992 – 1995 **Staff Scientist**, Submillimeter Telescope Observatory, Steward Observatory, University of Arizona
- 1990 – 1992 **Postdoctoral Research Fellow**, Astronomy Department, University of Texas

Education

- 1988 – 1990 **Ph.D., University of Virginia** in Astronomy
Thesis title: *The Throes of Star Formation: A Study of the Orion-KL and DR21(OH) Molecular Clouds*
- 1985 – 1988 **M.A., University of Virginia** in Astronomy
Thesis title: *Observations of the ^{13}C Isotopes of HC_3N : Implications for Carbon Isotope Studies in the Milky Way*
- 1981 – 1985 **B.A., University of California at Berkeley** in Astronomy

Skills

- Core Competency **Academic research, publishing, antenna design and performance evaluation, teaching, and consultation**
- Languages **Reading, writing and speaking competencies for English, German (moderate)**
- Programming **Python, C, PHP, \LaTeX , FORTRAN**
- Databases **MySQL.**
- Web Dev **HTML, CSS, JavaScript, Apache Web Server**
- Analysis **CASA, GILDAS, IDL, AIPS**

Miscellaneous Experience

Science Management

- 2018 – 2022 **Commission J Chair**, United States National Committee (USNC) International Union of Radio Science (URSI)
- 2008 – 2014 **Community Support Programs Coordinator**, National Radio Astronomy Observatory
- 2003 – 2010 **ALMA Calibration Group Lead**, Atacama Large Millimeter/submillimeter Array (ALMA)
- 1998 – 2004 **ALMA Test Facility Director**, Atacama Large Millimeter/submillimeter Array (ALMA)
- 1996 – 2001 **Deputy Assistant Director for Tucson Operations**, National Radio Astronomy Observatory

Miscellaneous Experience (continued)

1996 – 2014  **Research Experience for Undergraduates (REU) Program Coordinator**, National Radio Astronomy Observatory

Academic Appointments

2012 –  **Visiting Scholar in the Department of Astronomy**, University of Virginia











2005 – 2012  **Research Professor of Astronomy**, University of Virginia










References

Available on Request

Selected Research Publications

Full publications list available via ADS

- 1 Y. Gong, C. Henkel, C. T. Bop, *et al.*, “Shock-induced HCNH⁺ abundance enhancement in the heart of the starburst galaxy NGC 253 unveiled by ALCHEMI,” *A&A*, vol. 696, A31, Apr. 2025.  DOI: 10.1051/0004-6361/202452835.
- 2 E. Behrens, **J. G. Mangum**, S. Viti, *et al.*, “Neural Network Constraints on the Cosmic-Ray Ionization Rate and Other Physical Conditions in NGC 253 with ALCHEMI Measurements of HCN and HNC,” *ApJ*, vol. 977, no. 1, p. 38, Dec. 2024.  DOI: 10.3847/1538-4357/ad85db. arXiv: 2409.13821 [astro-ph.GA].
- 3 K. Tanaka, **J. G. Mangum**, S. Viti, *et al.*, “Volume Density Structure of the Central Molecular Zone NGC 253 through ALCHEMI Excitation Analysis,” *ApJ*, vol. 961, no. 1, p. 18, Jan. 2024.  DOI: 10.3847/1538-4357/ad0e64. arXiv: 2311.12106 [astro-ph.GA].
- 4 E. Behrens, **J. G. Mangum**, J. Holdship, *et al.*, “Tracing Interstellar Heating: An ALCHEMI Measurement of the HCN Isomers in NGC 253,” *ApJ*, vol. 939, no. 2, p. 119, Nov. 2022.  DOI: 10.3847/1538-4357/ac91ce. arXiv: 2209.06244 [astro-ph.GA].
- 5 J. Holdship, **J. G. Mangum**, S. Viti, *et al.*, “Energizing Star Formation: The Cosmic-Ray Ionization Rate in NGC 253 Derived from ALCHEMI Measurements of H₃O⁺ and SO,” *ApJ*, vol. 931, no. 2, p. 89, Jun. 2022.  DOI: 10.3847/1538-4357/ac6753. arXiv: 2204.03668 [astro-ph.GA].
- 6 N. Falstad, S. Aalto, S. König, *et al.*, “CON-quest. Searching for the most obscured galaxy nuclei,” *A&A*, vol. 649, A105, May 2021.  DOI: 10.1051/0004-6361/202039291. arXiv: 2102.13563 [astro-ph.GA].
- 7 S. Martín, **J. G. Mangum**, N. Harada, *et al.*, “ALCHEMI, an ALMA Comprehensive High-resolution Extragalactic Molecular Inventory. Survey presentation and first results from the ACA array,” *A&A*, vol. 656, A46, Dec. 2021.  DOI: 10.1051/0004-6361/202141567. arXiv: 2109.08638 [astro-ph.GA].
- 8 S. Aalto, S. Muller, S. König, *et al.*, “The hidden heart of the luminous infrared galaxy IC 860. I. A molecular inflow feeding opaque, extreme nuclear activity,” *A&A*, vol. 627, A147, Jul. 2019.  DOI: 10.1051/0004-6361/201935480. arXiv: 1905.07275 [astro-ph.GA].
- 9 **J. G. Mangum**, A. G. Ginsburg, C. Henkel, K. M. Menten, S. Aalto, and P. van der Werf, “Fire in the Heart: A Characterization of the High Kinetic Temperatures and Heating Sources in the Nucleus of NGC 253,” *ApJ*, vol. 871, no. 2, p. 170, Feb. 2019.  DOI: 10.3847/1538-4357/aafa15. arXiv: 1812.09219 [astro-ph.GA].
- 10 **J. G. Mangum** and Y. L. Shirley, “How to Calculate Molecular Column Density,” *PASP*, vol. 127, no. 949, p. 266, Mar. 2015.  DOI: 10.1086/680323. arXiv: 1501.01703 [astro-ph.IM].

- 11 **J. G. Mangum** and P. Wallace, “Atmospheric Refractive Electromagnetic Wave Bending and Propagation Delay,” *PASP*, vol. 127, no. 947, p. 74, Jan. 2015.  DOI: 10.1086/679582. arXiv: 1411.1617 [astro-ph.IM].
- 12 A. Greve and **J. Mangum**, “Mechanical Measurements of the ALMA Prototype Antennas,” *IAPM*, vol. 50, no. 2, pp. 66–80, Apr. 2008.  DOI: 10.1109/MAP.2008.4562258. arXiv: 0710.5629 [astro-ph].
- 13 **J. G. Mangum**, D. T. Emerson, and E. W. Greisen, “The On The Fly imaging technique,” *A&A*, vol. 474, no. 2, pp. 679–687, Nov. 2007.  DOI: 10.1051/0004-6361:20077811. arXiv: 0709.0553 [astro-ph].
- 14 R. Snel, **J. Mangum**, and J. Baars, “Study of the Dynamics of Large Reflector Antennas with Accelerometers,” *IAPM*, vol. 49, no. 4, pp. 84–101, Aug. 2007.  DOI: 10.1109/MAP.2007.4385600. arXiv: 0710.4254 [astro-ph].
- 15 **J. G. Mangum**, J. W. M. Baars, A. Greve, *et al.*, “Evaluation of the ALMA Prototype Antennas,” *PASP*, vol. 118, no. 847, pp. 1257–1301, Sep. 2006.  DOI: 10.1086/508298. arXiv: astro-ph/0609329 [astro-ph].
- 16 J. W. M. Baars, R. N. Martin, **J. G. Mangum**, J. P. McMullin, and W. L. Peters, “The Heinrich Hertz Telescope and the Submillimeter Telescope Observatory,” *PASP*, vol. 111, no. 759, pp. 627–646, May 1999.  DOI: 10.1086/316365.
- 17 **J. G. Mangum** and A. Wootten, “Discovery of $^{14}\text{NH}_3(3, 3)$ Maser Emission in the Interstellar Medium,” *ApJL*, vol. 428, p. L33, Jun. 1994.  DOI: 10.1086/187386.
- 18 **J. G. Mangum**, “Main Beam Efficiency Measurements of the Caltech Submillimeter Observatory,” *PASP*, vol. 105, p. 117, Jan. 1993.  DOI: 10.1086/133134.
- 19 **J. G. Mangum** and A. Wootten, “Formaldehyde as a Probe of Physical Conditions in Dense Molecular Clouds,” *ApJS*, vol. 89, p. 123, Nov. 1993.  DOI: 10.1086/191841.
- 20 **J. G. Mangum**, “The Throes of Star Formation: a Study of the Orion-KL and DR21(OH) Molecular Clouds,” Ph.D. dissertation, University of Virginia, Jan. 1990.