

Jason Tumlinson

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Personal

U. S. Citizen, date of birth 1/29/1975

Education

B.A. 1997 Physics, Rice University

M.S. 1999 Astrophysical and Planetary Sciences, University of Colorado – Boulder

Ph. D. 2002 Astrophysical and Planetary Sciences, University of Colorado – Boulder

Research and Teaching Experience

September 2005 – present: Gilbert and Jaylee Mead Postdoctoral Fellow, Department of Physics and Yale Center for Astronomy and Astrophysics, Yale University

September 2002 – August 2005: Edwin P. Hubble Scientist, Department of Astronomy and Astrophysics, University of Chicago

January 1998 – August 2002: Research Assistant to J. Michael Shull, APS, University of Colorado at Boulder

September 1997 - December 1997: Teaching Assistant to Ted Snow, APS, CU-Boulder

May 1996 - June 1997: Research Assistant to Patrick Hartigan, Department of Space Physics and Astronomy, Rice University

Research Interests

The first stars, galaxy formation, interstellar and intergalactic matter, nucleosynthesis

Supported Research

Lead Investigator, “Molecule Formation at High Extinction in the LMC/SMC”, FUSE Cycle 3

Principal Investigator, “IGM Phases and Metals with New SDSS QSOs”, HST Cycle 12

Principal Investigator, “IGM Phases and HVCs in 37 SDSS Galaxy Groups”, FUSE Cycle 5

Principal Investigator, “H₂ in an Extragalactic Halo Cloud toward 3C232”, FUSE Cycle 6

Principal Investigator, “Interstellar Processes at Low Metallicity”, NCSA Computing Allocation

Professional Activities

Associate Member of the FUSE Principal Investigator Team

Science Team, High-Orbit Origins Satellite (HORUS) NASA Origins Probe Concept Study

Visiting Scholar, Kavli Institute for Theoretical Physics, “IGM/Galaxy Interactions”, Nov. 2004

NASA FUSE General Observer Peer Review Panel

Awards

University of Colorado Fellowship, 1997-2002

Forthcoming Publications

- Tumlinson, J.** 2005 “Chemical Evolution in Hierarchical Models of Cosmic Structure I: Constraints on the Early Stellar Initial Mass Function”, ApJ, in press (astro-ph/0507442)
- Conners, T. W., Kawata, D., Bailin, J., **Tumlinson, J.**, and Gibson, B. K. 2005 “On the origin of Anomalous Velocity Clouds in the Milky Way”, ApJL, in press (astro-ph/0509314)
- Stocke, J. T., Penton, S. V., Danforth, C. W., Shull, J. M., & **Tumlinson, J.** 2005 “The Galaxy Environment of OVI Absorption Systems”, ApJ, in press (astro-ph/0509822)
- Gillmon, K. A., Shull, J. M., & **Tumlinson, J.**, & Danforth, C. W. 2005, “A FUSE Survey of Molecular Hydrogen in the Galactic Halo”, ApJ, in press (astro-ph/0507581)

Refereed Publications

- Tumlinson, J.**, & Fang, T. 2005 “Hot Baryons and the Distribution of Metals in the Intergalactic Medium”, ApJ, 623, L97
- Keeney, B.A., Momjian, E., Stocke, J. T., Carilli, C. L., & **Tumlinson, J.** 2005 “Absorption Line Study of Halo Gas in NGC 3067 toward 3C 232”, ApJ, 622, 267
- Tumlinson, J.**, Shull, J. M., Giroux, M. L., & Stocke, J. T. “The Hot IGM – Galaxy Connection: Two Strong O VI Absorbers toward PG1211+143”, ApJ, 620, 95
- Tumlinson, J.**, Venkatesan, A., & Shull, J. M. 2004, “Nucleosynthesis, Reionization, and the Mass Function of the First Stars”, ApJ, 612, 602 (TVS04)
- Shull, J. M., **Tumlinson, J.**, Giroux, M. L., Kriss, G. A., et al. 2004, “The Fluctuating Intergalactic Radiation Field at Redshifts $z = 2.3-2.9$ from He II and H I Absorption toward HE 2347-4342”, ApJ, 2004, 600, 570
- Shull, J. M., **Tumlinson, J.**, & Giroux, M. L. 2003, “The Multiphase Intergalactic Medium toward PKS2155-304”, ApJ, 594, L107
- Venkatesan, A., **Tumlinson, J.**, & Shull, J. M. 2003, “Evolving Spectra of Population III Stars: Consequences for Cosmological Reionization”, ApJ, 584, 621 (VTS03)
- Tumlinson, J.**, Shull, J. M., & Venkatesan, A. 2003, “Cosmological Effects of the First Stars: Evolving Spectra of Population III”, ApJ, 584, 608 (TSV03)
- Browning, M. K., **Tumlinson, J.**, & Shull, J. M. 2003 “Inferring Physical Conditions in Interstellar Clouds of H₂”, ApJ, 582, 810
- Rachford, B. L., Snow, T. P., **Tumlinson, J.**, Shull, J. M., et al. 2002 “A FUSE Survey of Interstellar Molecular Hydrogen in Translucent Clouds”, ApJ, 577, 221
- Welsh, B. Y., Rachford, B. L., & **Tumlinson, J.** 2001, “High-velocity Molecular Hydrogen Gas Associated with the Monoceros Loop Supernova Remnant”, A&A, 381, 566
- Gibson, B. K., Giroux, M. L., Penton, S. V., Stocke, J. T., Shull, J. M., **Tumlinson, J.** 2001 “High-Velocity Cloud Complex C: Galactic Fuel or Galactic Waste?”, AJ, 122, 3280
- Tumlinson, J.**, Shull, J. M., Rachford, B. L., Browning, M. L., Snow, T. P., Fullerton, A. W., Jenkins, E. B., Savage, B. D., Crowther, P. A., Moos, H. W., Sembach, K. S., Sonneborn, G., & York, D. G. 2002 “A FUSE Survey of Molecular Hydrogen in the Small and Large Magellanic Clouds”, ApJ, 566, 857
- Kriss, G. A., Shull, J. M., Oegerle, W. R., Zheng, W., Davidsen, A. F., Songaila, A., **Tumlinson, J.**, et al. (12 others) 2001 “Resolving the Structure of Ionized Helium in the Intergalactic Medium with FUSE”, Science, 293, 1112

- Tripp, T. M., Giroux, M. L., Stocke, J. T., **Tumlinson, J.**, & Oegerle, W. R. 2001 “The Ionization and Metallicity of the Intervening O VI Absorber at $z = 0.121$ in the Spectrum of H1821+643”, *ApJ*, 563, 724
- Rachford, B. L., Snow, T. P., **Tumlinson, J.**, et al. 2001, “FUSE Observations of Molecular Hydrogen in Translucent Interstellar Clouds: II. The Line of Sight Toward HD 110432”, *ApJ*, 555, 839
- Tumlinson, J.**, Giroux, M. L., & Shull, J. M. 2001 “Probing the First Stars with Hydrogen and Helium Recombination Emission”, *ApJ*, 550, L1 (TGS01)
- Shull, J. M., **Tumlinson, J.**, Rachford, B. L., Snow, T. P., et al. “FUSE Observations of Diffuse Interstellar Molecular Hydrogen” 2000b, *ApJ*, 538, L73
- Shull, J. M., Giroux, M. L., Penton, S. V., **Tumlinson, J.**, Stocke, J. T., et al. “FUSE Observations of the Low-Redshift Lyman-beta Forest” 2000, *ApJ*, 538, L13
- Snow, T. P., Rachford, B. L., **Tumlinson, J.**, Shull, J. M., et al. “FUSE Observations of Molecular Hydrogen in Translucent Interstellar Clouds” 2000, *ApJ*, 538, L69
- Fullerton, A. W., . . . , **Tumlinson, J.**, Willis, A. J. 2000 “Far Ultraviolet Spectroscopic Explorer Observations of the Stellar Winds of Two O7 Supergiants in the Magellanic Clouds”, *ApJ*, 538, L43
- Ferlet, R., Andre, M., . . . , **Tumlinson, J.**, York, D. G., Moos, H. W. 2000 “FUSE Observations of the HD Molecule Toward HD 73882”, *ApJ*, 538, L69
- Tumlinson, J.**, & Shull, J. M. 2000 “Zero-metallicity Stars and the Effects of the First Stars on Reionization”, *ApJ*, 528, L65 (TS00)
- Tumlinson, J.**, Giroux, M.L., Shull, J.M., & Stocke, J.T. 1999 “New HST Observations of the Halo Gas of NGC 3067: Limits on the Extragalactic Ionizing Background at Low Redshift and the Lyman Continuum Escape Fraction”, *AJ*, 118, 2148
- Hartigan, P.M., Morse, J.A., **Tumlinson, J.**, Raymond, J.C., Heathcote, S. 1999 “HST/ FOS Optical and Ultraviolet Spectroscopy of the Bow Shock HH47A”, *ApJ* 512, 901

Invited Talks and Colloquia (First Stars)

- “Ending the Dark Ages: A New Synthesis Reveals the First Stars”, University of Michigan, October 2005, *departmental colloquium*
- “Chemical Evolution and Galaxy Formation: A New Synthesis Reveals the First Stars” Workshop on Mass, Light, and Chemistry in the Early Universe, U. of Minnesota, October 2005, *invited talk*
- “Near-Field Cosmology, or, What the Galaxy Can Teach Us about the First Stars?”, Argonne National Laboratory, June 2005, *invited talk*
- “The First Stars: Nucleosynthesis and Reionization”, Workshop on First Light Detection, UC Irvine, May 2005, *invited talk*
- “The First Stars and the Reionization”, National Radio Astronomy Observatory, February 2005, *departmental colloquium*
- “The First Stars: A Review”, New Windows on Star Formation in the Cosmos, The 15th Annual Astrophysics Conference in Maryland, October 2004, *invited review*
- “From Nucleosynthesis to Reionization: Observational Constraints on the Nature of the First Stars”, AAS, Denver, June 2004, First Stars and QSOs Special Session, *invited talk*
- “The End of the Dark Ages: The First Stars and Reionization”, Department of Physics and

- Astronomy, Northwestern University, March 2004, *departmental colloquium*
“The First Stars and Reionization”, Department of Astronomy, University of Wisconsin,
Madison, February 2003, *departmental colloquium*
“The First Stars and Reionization”, Department of Astronomy, University of Chicago, October
2002, *departmental colloquium*

Invited Talks and Colloquia (ISM/IGM)

- “FUSE’s Five Years of Progress on the Interstellar Medium”, Astrophysics in the Far
Ultraviolet: Five Years of Discovery with FUSE, August 2004, *invited review*
(astroph/0411249)
“SDSS Probes the Galaxy/IGM Connection”, Department of Physics and Astronomy, Arizona
State University, April 2004, *special colloquium*
“SDSS and VLST Probe the Galaxy/IGM Connection” at the Very Large Space Telescope
Science Workshop, STScI, February 2004

Public Talks

- “The First Stars”, Chicago Astronomical Society at Adler Planetarium, Chicago, July 2004

Selected Conference Proceedings (Exclusive of Above)

- Ulmer, M.P., Kibblewhite, E.J., Herter, T. L., Thompson, L. A., Giovanelli, R., Harper, D.A.,
Kron, R. G., Mohr, J. J., Stacey, G. J., **Tumlinson, J.**, & York, D. G. “Large Telescope
Project Dedicated to an Origins Survey”, SPIE Proceedings of the Second Baskog
Workshop on Extremely Large Telescopes, ed. A. Ardeberg & T. Andersen, 2004, pp. 193-
204
- Gillmon, K., Shull, J. M., **Tumlinson, J.**, “FUSE Survey of Interstellar Molecular Hydrogen
toward 40 High-Latitude AGN”, AAS, Denver, June 2004
- Shull, J. M., Anderson, K. A., **Tumlinson, J.** “FUSE Survey of Interstellar Molecular Hydrogen
toward 130 Galactic Disk Sightlines”, AAS, Denver, June 2004
- Tumlinson, J.**, Shull, J. M., Venkatesan, A. “Cosmological Reionization by the First Stars:
Evolving Spectra of Population III”, 27th IAP Colloquium, Paris, 2001
- Tumlinson, J.**, Shull, J. M., Rachford, B., Snow, T. P., Jenkins, E. B., Savage, B. D., Sembach,
K. R., Sonneborn, G., York, D. G. “FUSE Observations of Interstellar Molecular
Hydrogen”, BAAS, 195, 6.08
- Sonneborn, G., Shull, J. M., **Tumlinson, J.**, Jenkins, E. B., Savage, B. D., Moos, H. W.,
Sembach, K. R., York, D. G. “FUSE Observations of Interstellar Molecular Hydrogen in
the Small Magellanic Cloud”, BAAS, 195, 6.10
- Shull, J. M., Giroux, M. L., Penton, S. V., **Tumlinson, J.**, Jenkins, E. B., Savage, B. D.,
Sembach, K. R., York, D. G., “FUSE Observations of Intergalactic Lyman Beta Absorbers
at Low Redshift”, BAAS, 195, 6.15
- Snow, T. P., Rachford, B. L., **Tumlinson, J.**, Shull, J. M., Blair, W. P., Ferlet, R., Friedman, S.
D., Gry, C., Jenkins, E. B., Morton, D. C., Savage, B. D., Sembach, K. R., Vidal-Madjar,
A., Welty, D. E., York, D. G. “FUSE Observations of Molecular Hydrogen in Translucent
Interstellar Clouds”, BAAS, 195, 6.07
- Tumlinson, J.** 2000, “Light and Metals from Population III Stars”, Proceedings of the Second
MPA/ESO Workshop on “The First Stars” eds. Weiss, Abel, Hill, Springer: Heidelberg

References

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For a firsthand assessment of my teaching and advising, you may contact Kristen Gillmon (kgillmon@astro.berkeley.edu). I advised Kristen as an undergraduate for three years (2000-2002), she is now a graduate student in astronomy at Berkeley.