

Benjamin M. Tofflemire

CONTACT INFORMATION	Department of Astronomy University of Wisconsin-Madison 475 N. Charter Street Madison, WI 53706	tofflemi@astro.wisc.edu phone: (503) 805-0214
RESEARCH INTERESTS	T Tauri stars, formation and evolution of binary stars, accretion diagnostics, magnetic reconnection, structure and evolution of protoplanetary disks, time-domain astrophysics	
EDUCATION	Ph.D. Candidate Astronomy University of Wisconsin-Madison <ul style="list-style-type: none">• Advisor: Professor Robert D. Mathieu• Thesis: <i>Accretion Dynamics in Pre-Main Sequence Binary Stars</i>• Expected Graduation: Spring 2018 B.S. Astronomy & Physics University of Washington	August 2011 - present Madison, WI, USA June 2011 Seattle, WA, USA
RESEARCH EXPERIENCE	Graduate Research Assistant Advisor: Prof. Robert D. Mathieu <ul style="list-style-type: none">• Measured the accretion rate for a sample of 9 pre-main sequence binaries as a function of orbital phase to test numerical models of binary accretion• Characterized the kinematics and spatial distribution of accretion streams feeding young binary star systems with time-series, high-resolution spectroscopy from the SALT telescope• Determined membership and binary population of evolved stars in the open cluster NGC 6791, as part of the WIYN Open Cluster Study, through multi-epoch, radial-velocity measurements Advisor: Dr. Marina Orio	University of Wisconsin-Madison June 2012 - present August 2011 - December 2013 <ul style="list-style-type: none">• Modeled <i>Chandra</i> and <i>XMM-Newton</i> X-ray grating spectra of recurrent novae to determine white dwarf photospheric temperatures and the physical characteristics of ejected material NSF Research Experiences for Undergraduates Advisor Prof. Alex Lazarian June 2010 - January 2011 <ul style="list-style-type: none">• Analyzed MHD simulations of ISM turbulence in search of statistical relationships between observable quantities (column density distributions) and magnetic field strength Undergraduate Research Assistant Advisor: Prof. Suzanne Hawley and Prof. John Wisniewski September 2009 - Nov 2011 <ul style="list-style-type: none">• Characterized the near-infrared variability of magnetic reconnection events on M dwarfs
OBSERVING PROPOSALS & EXPERIENCE	Southern African Large Telescope (PI and Co-I) <ul style="list-style-type: none">• Time-Series Spectroscopy of Pre-Main Sequence Binaries (153ks of P0/P1 time over 5 semesters) WIYN 3.5-m Telescope (PI and Co-I) <ul style="list-style-type: none">• Radial velocity survey of accreting stars in NGC 2264 (2 nights)• Time-series spectroscopy of flare stars in Pleiades star cluster (3 nights)• WIYN Open Cluster Study radial-velocity survey (~ 90 nights over 8 semesters) Las Cumbres Observatories Global Telescope Network (Co-I) <ul style="list-style-type: none">• Time-series photometry of Pre-Main Sequence Binaries (980 hours over 5 semesters) SMARTS 1.3m (PI) <ul style="list-style-type: none">• Time-series photometry of Pre-Main Sequence Binaries (107 hours over 4 semesters)• Time-series spectroscopy of Pre-Main Sequence Binary V4046 Sgr (42 hours) WIYN 0.9-m Telescope (PI) <ul style="list-style-type: none">• High Cadence Photometry of Pre-Main Sequence Binary DQ Tau (16 nights) APO: ARCSAT 0.5m (PI) <ul style="list-style-type: none">• High Cadence Photometry of Pre-Main Sequence Binary DQ Tau (16 nights)	

TALKS	Institute for Theory and Computation (Harvard-CfA) Stars and Planets Seminar (Invited)	March 2017 Cambridge, MA
	American Museum of Natural History Astronomy Seminar	March 2017 New York, NY
	Space Telescope Science Institute Exoplanets, Star and Planet Formation Seminar	March 2017 Baltimore, MD
	University of Texas-Austin Stars Seminar (Invited)	October 2016 Austin, TX
	Cool Stars 19 Contributed Talk	June 2016 Uppsala, Sweden
	Science with SALT Contributed Talk	June 2015 Stellenbosch, South Africa
	X-ray Binaries - 50 Years Since the Discovery of Sco X-1 Contributed Talk	July 2012 Chandra X-ray Center, Boston, MA
AWARDS	University of Wisconsin Graduate School Conference Presentation Award (\$1,800)	2016, 2017
	Sigma Xi Grants in Aid of Research	(\$2,500) 2015
	University of Wisconsin Vilas Conference Presentation Award	(\$600) 2015
	University of Wisconsin Vilas Research Travel Grant	(\$600) 2015
	AAS 225 Chambliss Student Prize Honorable Mention	2015
	University of Wisconsin – University Housing Honored Instructor	2012
	University of Washington’s Astronomy Bear Prize Recipient	2011
	University of Washington Mary Gates Research Scholarship	(\$2,000) 2011
SERVICE	University of Washington Mary Gates Research Scholarship	(\$2,000) 2010
	Graduate Admissions Committee	2015 - 2016
	NASA ROSES Review Panel Secretary	2015
	Graduate Student Czar (Elected Student-Faculty Liaison)	2014 - 2015
MENTORING EXPERIENCE	Undergraduate Liaison to the Univ. of Washington Astronomy Department	2010 - 2011
	UW-Madison Undergrad Research	June 2015 - June 2017
	Graduate Student Mentor (Nathan Eggen)	University of Wisconsin-Madison
	• Advised UW-Madison undergraduate Nathan Eggen on project to produce and model the lightcurves of Pre-Main Sequence binary stars	
	• Astronomy graduate student at the University of Minnesota	
	NSF REU	June - August 2014
	Graduate Student Mentor (Sarah Kessler)	University of Wisconsin-Madison
	• Co-advised undergraduates, Sarah Kessler and Francis Klein on a project searching for triple companions to spectroscopic binaries in open cluster M67 using <i>HST</i>	
	• Astronomy graduate student at Ohio State University	
	EAGLE School Science Mentor	Spring 2015
TEACHING EXPERIENCE	Science Mentor (Josh DuBeau)	Madison, WI
	• Held weekly meetings with junior-high student Josh DuBeau to help him create a class presentation on stellar evolution and exoplanet detection	
	Teaching Assistant	Fall 2012, Fall 2015
	Astronomy 103: The Evolving Universe	University of Wisconsin-Madison
OUTREACH	• Taught six discussion sections for Astronomy 103: The Evolving Universe, which included developing lesson plans and in-class activities	
	Space Place	November 2016
	• Invited lecture to amateur astronomy community	Madison, WI

Senior Summer School

- Invited lecture to the Senior Summer School educational, vacation program

July 2014

Chicago, IL

Universe in the Park

- Visit Wisconsin state parks to host public observing and astronomy presentations

2011-present**Washburn Public Observing Nights**

- Host public observing nights at the historic Washburn observatory

2011-present**TECHNICAL
SKILLS****Programming Languages and Astronomy Software**

- Experienced: python, LaTeX, IRAF, DS9, IDL, Source Extractor
- Basic Knowledge: Fortran

**PEER-REVIEWED
PUBLICATIONS****First Author Publications**

6. *Pulsed Accretion in the Classical T Tauri Binary TWA 3A* – Tofflemire, B. M., Mathieu, R. D., Herczeg, G. J., Akeson, R. L., & Ciardi, D. R. 2017b, ApJL, 842, L12
5. *Accretion and Magnetic Reconnection in the Classical T Tauri Binary DQ Tau* – Tofflemire, B. M., Mathieu, R. D., Ardila, D. R., Akeson, R. L., Ciardi, D. R., Johns-Krull, C., Herczeg, G. J., & Quijano-Vodniza, A. 2017a, ApJ, 835, 8
4. *WIYN Open Cluster Study. LIX. Radial Velocity Membership of the Evolved Population of the Old Open Cluster NGC 6791* – Tofflemire, B. M., Gosnell, N. M., Mathieu, R. D., & Platais, I. 2014, AJ, 148, 61
3. *X-Ray Grating Observations of Recurrent Nova T Pyxidis during the 2011 Outburst* – Tofflemire, B. M., Orio, M., Page, K. L., Osborne, J. P., Ciroi, S., Cracco, V., Di Mille, F., & Maxwell, M. 2013, ApJ, 779, 22
2. *The Implications of M Dwarf Flares on the Detection and Characterization of Exoplanets at Infrared Wavelengths* – Tofflemire, B. M., Wisniewski, J. P., Kowalski, A. F., Schmidt, S. J., Kundurthy, P., Hilton, E. J., Holtzman, J. A., & Hawley, S. L. 2012, AJ, 143, 12
1. *Interstellar Sonic and Alfvénic Mach Numbers and the Tsallis Distribution* – Tofflemire, B. M., Burkhart, B., & Lazarian, A. 2011, ApJ, 736, 60

Other Publications

12. *Chemical and Physical Parameters from X-Ray High-resolution Spectra of the Galactic Nova V959 Mon* – Peretz, U., Orio, M., Behar, E., et al. (including **Tofflemire, B. M.**) 2016, ApJ 829, 2 829, 2
11. *WIYN Open Cluster Study. LXXI. Spectroscopic Membership and Orbits of NGC 6791 Sub-Subgiants* – Milliman, K. E., Leiner, E., Mathieu, R. D., **Tofflemire, B. M.**, & Platais, I. 2016, AJ, 151, 152
10. *A Cautionary Tale: MARVELS Brown Dwarf Candidate Reveals Itself to be a Very Long Period, Highly Eccentric Spectroscopic Stellar Binary* – Mack, C. E., III, Ge, J., Deshpande, R., et al. (including **Tofflemire, B. M.**) 2013, AJ, 145, 139
9. *Thomson scattering and collisional ionization in the X-ray grating spectra of the recurrent nova U Scorpii* – Orio, M., Behar, E., Gallagher, J., et al. (including **Tofflemire, B. M.**) 2013, MNRAS, 429, 1342
8. *Very Low Mass Stellar and Substellar Companions to Solar-like Stars from MARVELS. II. A Short-period Companion Orbiting an F Star with Evidence of a Stellar Tertiary and Significant Mutual Inclination* – Fleming, S. W., Ge, J., Barnes, R., et al. (including **Tofflemire, B. M.**) 2012, AJ, 144, 72
7. *Very Low Mass Stellar and Substellar Companions to Solar-like Stars from MARVELS. I. A Low-mass Ratio Stellar Companion to TYC 4110-01037-1 in a 79 Day Orbit* – Wisniewski, J. P., Ge, J., Crepp, J. R., et al. (including **Tofflemire, B. M.**) 2012, AJ, 143, 107
6. *A Multi-survey Approach to White Dwarf Discovery* – Sayres, C., Subasavage, J. P., Bergeron, P., et al. (including **Tofflemire, B. M.**) 2012, AJ, 143, 103

5. *Probing the Flare Atmospheres of M Dwarfs Using Infrared Emission Lines* – Schmidt, S. J., Kowalski, A. F., Hawley, S. L., et al. (including **Tofflemire, B. M.**) 2012, ApJ, 745, 14
4. *PDS 144: The First Confirmed Herbig Ae-Herbig Ae Wide Binary* – Hornbeck, J. B., Grady, C. A., Perrin, M. D., et al. (including **Tofflemire, B. M.**) 2012, ApJ, 744, 54
3. *SDSS-III: Massive Spectroscopic Surveys of the Distant Universe, the Milky Way, and Extra-Solar Planetary Systems* – Eisenstein, D. J., Weinberg, D. H., Agol, E., et al. (including **Tofflemire, B. M.**) 2011, AJ, 142, 72
2. *The Eighth Data Release of the Sloan Digital Sky Survey: First Data from SDSS-III* – Aihara, H., Allende Prieto, C., An, D., et al. (including **Tofflemire, B. M.**) 2011, ApJS, 193, 29
1. *Near-infrared Multi-band Photometry of the Substellar Companion GJ 758 B* – Janson, M., Carson, J., Thalmann, C., et al. (including **Tofflemire, B. M.**) 2011, ApJ, 728, 85

CONFERENCE
PROCEEDINGS &
OTHER WORKS

Conference Proceedings & Abstracts

9. *Accretion Dynamics in Pre-main Sequence Binaries* – Tofflemire, B. M. et al. 2017, Francesco’s Legacy - Star Formation in Space and Time, in preparation
8. *Accretion and Magnetic Reconnection in the Pre-Main Sequence Binary DQ Tau as Revealed through High-Cadence Optical Photometry* – Tofflemire, B. M., Mathieu, R. D., Ardila, D. R., et al. 2016, American Astronomical Society Meeting Abstracts, 227, 236.06
7. *Time-series Photometry of the Pre-Main Sequence Binary V4046 Sgr: Testing the Accretion Stream Theory* – Tofflemire, B. M., Mathieu, R. D., Ardila, D. R., & Ciardi, D. R. 2015, American Astronomical Society Meeting Abstracts, 225, 348.11
6. *Accretion Dynamics in Pre-Main Sequence Binaries* – Tofflemire, B. M. 2015, SALT Science Conference 2015 (SSC2015), 26
5. *WIYN Open Cluster Study: Radial Velocity Membership of the Evolved Population of Open Cluster NGC 6791* – Tofflemire, B. M., Gosnell, N. M., & Mathieu, R. D. 2013, American Astronomical Society Meeting Abstracts, 222, 214.04
4. *X-ray Grating Observations of Recurrent Nova T Pyx* – Tofflemire, B. M. 2012, X-ray Binaries. Celebrating 50 Years Since the Discovery of Sco X-1, 57
3. *Analysis of MHD Interstellar Turbulence using Tsallis Statistics* – Tofflemire, B. M., Lazarian, A., & Burkhart, B. 2011, Bulletin of the American Astronomical Society, 43, 251.02
2. *M Dwarf Flares: Exoplanet Detection Implications* – Tofflemire, B. M., Wisniewski, J. P., Hilton, E. J., et al. 2011, 16th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, 448, 1287
1. *M Dwarf Flares: Exoplanet Implications* – Tofflemire, B. M., Wisniewski, J. P., Kowalski, A. F., et al. 2010, Bulletin of the American Astronomical Society, 42, 423.15

Other Work

2. *Chandra X-ray grating observation of Nova LMC 2012* – Orio, M., Tofflemire, B. M., & Truran, J. 2012, The Astronomer’s Telegram, 4092
1. *A Chandra grating observation of T Pyxidis* – Tofflemire, B. M., Orio, M., Kuulkers, E., et al. 2011, The Astronomer’s Telegram, 3762