

Benjamin M. Tofflemire

CONTACT INFORMATION	Department of Astronomy University of Wisconsin-Madison 475 N. Charter Street Madison, WI 53706 Website: tofflemire.github.io	tofflemi@astro.wisc.edu phone: (503) 805-0214
RESEARCH INTERESTS	T Tauri stars, formation and evolution of binary stars, accretion diagnostics, magnetic reconnection events, 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 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
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 University of Washington Mary Gates Research Scholarship (\$2,000) 2010	
OBSERVING EXPERIENCE	Southern African Large Telescope <ul style="list-style-type: none">• PI: Time-Series Spectroscopy of Pre-Main Sequence Binaries (42.5 hrs of P0/P1) WIYN 3.5-m Telescope <ul style="list-style-type: none">• PI: Radial velocity survey of accreting stars in NGC 2264 (2 nights)• PI: Time-series spectroscopy of flare stars in Pleiades star cluster (3 nights)• Co-I: WIYN Open Cluster Study radial-velocity survey (~ 90 nights over 8 semesters)	

Las Cumbres Observatories Global Telescope Network

- Co-I: Time-series photometry of Pre-Main Sequence Binaries (980 hours over 5 semesters)

SMARTS 1.3m

- **PI:** Time-series photometry of Pre-Main Sequence Binaries (107 hours over 4 semesters)
- **PI:** Time-series spectroscopy of Pre-Main Sequence Binary V4046 Sgr (42 hours)

WIYN 0.9-m Telescope

- **PI:** High Cadence Photometry of Pre-Main Sequence Binary DQ Tau (16 nights)

APO: ARCSAT 0.5m

- **PI:** 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

SERVICE

UW-Madison Astronomy Graduate Admissions Committee (Elected)	2015 - 2016
NASA ROSES Review Panel Secretary	2015
Graduate Student-Faculty Liaison (Elected)	2014 - 2015
Undergraduate Liaison to the Univ. of Washington Astronomy Department	2010 - 2011

**MENTORING
EXPERIENCE**

DELTA (CIRTL) Mentor Training Seminar Class focused on establishing realistic expectations, considering the issues of human diversity, and developing a reflective approach to mentoring	Summer 2014
UW-Madison Undergrad Research Graduate Student Mentor	June 2015 - June 2017 University of Wisconsin-Madison
<ul style="list-style-type: none"> • Advised Nathan Eggen (currently a University of Minnesota graduate student) on project to produce and model the lightcurves of Pre-Main Sequence binary stars 	
NSF REU Graduate Student Mentor	June - August 2014 University of Wisconsin-Madison
<ul style="list-style-type: none"> • Co-advised Sarah Kessler (currently an Ohio State graduate student) and Francis Klein on a project searching for triple companions to spectroscopic binaries in open cluster M67 using <i>HST</i> 	
EAGLE School Science Mentor Science Mentor	Spring 2015 Madison, WI
<ul style="list-style-type: none"> • Held weekly meetings with junior-high student Josh DuBeau to help him create a class presentation on stellar evolution and exoplanet detection 	

**TEACHING
EXPERIENCE**

Course Development & Teaching Astronomy 140: The Exoplanet Revolution	Fall 2017, Spring 2018 University of Wisconsin-Madison
<ul style="list-style-type: none"> • Co-developing curriculum and labs for an introductory-level class on exoplanets with Prof. Mathieu • Co-teaching first implantation of course with Prof. Mathieu Spring 2018 	

Teaching Assistant

Astronomy 103: The Evolving Universe

Fall 2012, Fall 2015

University of Wisconsin-Madison

- Taught six discussion sections pre week, which included developing lesson plans and in-class activities

OUTREACH**Universe in the Park****2011-present**

- Visit Wisconsin state parks to host public observing and astronomy presentations (>15 events hosted)

Washburn Public Observing Nights**2011-present**

- Host public and private observing nights at the historic Washburn observatory (>15 events hosted)

Girls Inc. Planetarium Shows**2014**

- Presented planetarium shows to Madison's local chapter of Girls Inc.

Space Place**November 2016**

- Invited lecture to amateur astronomy community (televised)

Madison, WI

Senior Summer School**July 2014**

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

Chicago, IL

**TECHNICAL
SKILLS****Programming Languages**

- Experienced: python, IDL
- Basic Knowledge: Fortran

Tools

- L^AT_EX, IRAF, DS9, Source Extractor, Git

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

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

Co-Author Publications

12. Peretz, U., Orio, M., Behar, E., Bianchini, A., Gallagher, J., Rauch, T., **Tofflemire**, B., & Zemko, P., 2016, ApJ 829, 2 829, 2 – *Chemical and Physical Parameters from X-Ray High-resolution Spectra of the Galactic Nova V959 Mon*
11. Milliman, K., Leiner, E., Mathieu, R., **Tofflemire**, B., & Platais, I. 2016, AJ, 151, 152 – *WIYN Open Cluster Study. LXXI. Spectroscopic Membership and Orbits of NGC 6791 Sub-Subgiants*
10. Mack, C., III, Ge, J., Deshpande, R., et al. (including **Tofflemire**, B. and 41 co-authors) 2013, AJ, 145, 139 – *A Cautionary Tale: MARVELS Brown Dwarf Candidate Reveals Itself to be a Very Long Period, Highly Eccentric Spectroscopic Stellar Binary*

9. Orio, M., Behar, E., Gallagher, J., Bianchini, A., Chiosi, E., Luna, G., Nelson, T., Rauch, T., Schaefer, B., & **Tofflemire**, B., 2013, MNRAS, 429, 1342 – *Thomson scattering and collisional ionization in the X-ray grating spectra of the recurrent nova U Scorpii*
8. Fleming, S. W., Ge, J., Barnes, R., et al. (including **Tofflemire**, B. and 58 co-authors) 2012, AJ, 144, 72 – *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*
7. Wisniewski, J. P., Ge, J., Crepp, J. R., et al. (including **Tofflemire**, B. and 41 co-authors) 2012, AJ, 143, 107 – *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*
6. Sayres, C., Subasavage, J. P., Bergeron, P., Dufour, P., Davenport, J., AlSayyad, Y., & **Tofflemire**, B., 2012, AJ, 143, 103 – *A Multi-survey Approach to White Dwarf Discovery*
5. Schmidt, S., Kowalski, A., Hawley, S., Hilton, E., Wisniewski, J., & **Tofflemire**, B., 2012, ApJ, 745, 14 – *Probing the Flare Atmospheres of M Dwarfs Using Infrared Emission Lines*
4. Hornbeck, J., Grady, C., Perrin, M., Wisniewski, J., **Tofflemire**, B., et al. (11 co-authors) 2012, ApJ, 744, 54 – *PDS 144: The First Confirmed Herbig Ae-Herbig Ae Wide Binary*
3. Eisenstein, D. J., Weinberg, D. H., Agol, E., et al. (including **Tofflemire**, B. and 252 co-authors) 2011, AJ, 142, 72 – *SDSS-III: Massive Spectroscopic Surveys of the Distant Universe, the Milky Way, and Extra-Solar Planetary Systems*
2. Aihara, H., Allende Prieto, C., An, D., et al. (including **Tofflemire**, B. and 176 co-authors) 2011, ApJS, 193, 29 – *The Eighth Data Release of the Sloan Digital Sky Survey: First Data from SDSS-III*
1. Janson, M., Carson, J., Thalmann, C., et al. (including **Tofflemire**, B. and 44 co-authors) 2011, ApJ, 728, 85 – *Near-infrared Multi-band Photometry of the Substellar Companion GJ 758 B*

OTHER
PUBLICATIONS

Conference Proceedings

4. **Tofflemire**, B., Mathieu, R., Herczeg, G., et al. 2017, Francesco’s Legacy - Star Formation in Space and Time, in press – *Accretion Dynamics in Pre-main Sequence Binaries*
3. **Tofflemire**, B., 2015, SALT Science Conference 2015 (SSC2015), 26 – *Accretion Dynamics in Pre-Main Sequence Binaries*
2. **Tofflemire**, B., 2012, X-ray Binaries. Celebrating 50 Years Since the Discovery of Sco X-1, 57 – *X-ray Grating Observations of Recurrent Nova T Pyx*
1. **Tofflemire**, B., Wisniewski, J., Hilton, E., et al. 2011, 16th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, 448, 1287 – *M Dwarf Flares: Exoplanet Detection Implications*

Conference Poster Abstracts

5. **Tofflemire**, B., Mathieu, R., Ardila, D., et al. 2016, American Astronomical Society Meeting Abstracts, 227, 236.06 – *Accretion and Magnetic Reconnection in the Pre-Main Sequence Binary DQ Tau as Revealed through High-Cadence Optical Photometry*
4. **Tofflemire**, B., Mathieu, R., Ardila, D., & Ciardi, D. 2015, American Astronomical Society Meeting Abstracts, 225, 348.11 – *Time-series Photometry of the Pre-Main Sequence Binary V4046 Sgr: Testing the Accretion Stream Theory*
3. **Tofflemire**, B., Gosnell, N., & Mathieu, R., 2013, American Astronomical Society Meeting Abstracts, 222, 214.04 – *WIYN Open Cluster Study: Radial Velocity Membership of the Evolved Population of Open Cluster NGC 6791*

2. **Tofflemire**, B., Lazarian, A., & Burkhart, B., 2011, Bulletin of the American Astronomical Society, 43, 251.02 – *Analysis of MHD Interstellar Turbulence using Tsallis Statistics*
1. **Tofflemire**, B., Wisniewski, J., Kowalski, A., et al. 2010, Bulletin of the American Astronomical Society, 42, 423.15 – *M Dwarf Flares: Exoplanet Implications*

Astronomer’s Telegram

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

CARMA Memo

1. Wright, M., Pound, M., Plambeck, R., et al. (including **Tofflemire**, B.), 2011, CARMA Summer School 2011, CARMA Memoranda Index #56

REFERENCES

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