Benjamin M. Tofflemire

Contact Information

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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 — **August 2011 - present**
University of Wisconsin-Madison — Madison, WI, USA
- Advisor: Professor Robert D. Mathieu
- Thesis: *Accretion Dynamics in Pre-Main Sequence Binary Stars*
- Expected Graduation: Spring 2018

B.S. Astronomy & Physics — **June 2011**
University of Washington — Seattle, WA, USA

Research Experience

Graduate Research Assistant — University of Wisconsin-Madison
Advisor: Prof. Robert D. Mathieu — **June 2012 - present**
- 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 — **August 2011 - December 2013**
- Modeled *Chandra* and *XMM-Newton* 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 — University of Wisconsin-Madison
Advisor Prof. Alex Lazarian — **June 2010 - January 2011**
- Analyzed MHD simulations of ISM turbulence in search of statistical relationships between observable quantities (column density distributions) and magnetic field strength

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*

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 Proposals & Experience

Southern African Large Telescope
- **PI:** Time-Series Spectroscopy of Pre-Main Sequence Binaries (42.5 hrs of P0/P1)

WIYN 3.5-m Telescope
- **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 ($\sim$ 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)	**March 2017**
Stars and Planets Seminar (Invited)	Cambridge, MA
American Museum of Natural History	**March 2017**
Astronomy Seminar	New York, NY
Space Telescope Science Institute	**March 2017**
Exoplanets, Star and Planet Formation Seminar	Baltimore, MD
University of Texas-Austin	**October 2016**
Stars Seminar (Invited)	Austin, TX
Cool Stars 19	**June 2016**
Contributed Talk	Uppsala, Sweden
Science with SALT	**June 2015**
Contributed Talk	Stellenbosch, South Africa
X-ray Binaries - 50 Years Since the Discovery of Sco X-1	**July 2012**
Contributed Talk	Chandra X-ray Center, Boston, MA

Service

Graduate Admissions Committee	**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**

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 observing nights at the historic Washburn observatory (>10 events hosted)