

## Curriculum Vitae: McKinley C. Brumback

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CONTACT INFORMATION	Department of Physics and Astronomy Dartmouth College Hinman Box 6127 Hanover, NH 03755	mckinley.c.brumback.gr@dartmouth.edu www.dartmouth.edu/~mbrumback (603) 646-3231
EDUCATION	<b>Dartmouth College</b> , Hanover, NH  Ph.D. student, Physics & Astronomy Thesis Topic: A broad-band X-ray study of magnetic accretion in neutron star binaries Advisor: Prof. Ryan Hickox  <b>Hamilton College</b> , Clinton, NY  B.S., Physics Advisor: Prof. Gordon Jones	September 2014 - Present        September 2010 - May 2014
RESEARCH INTERESTS	X-ray binaries, accretion disks X-ray astronomy, galaxy evolution, active galactic nuclei	
RESEARCH EXPERIENCE	<b>Dartmouth Fellow</b> Department of Physics and Astronomy, Dartmouth College Advisor: Ryan Hickox Performed pulse-phase spectroscopy and tomography on X-ray pulsars LMC X-4 and SMC X-1 using <i>NuSTAR</i> and <i>XMM-Newton</i> . Intent to expand analysis to Her X-1. <b>Dartmouth Fellow</b> Department of Physics and Astronomy, Dartmouth College Advisor: Robert Fesen Analyzed images of Cassiopeia A supernova remnant to determine reverse shock speed and effects on ejecta <b>Research Assistant</b> Department of Physics, Hamilton College Advisor: Gordon Jones Designed, built, and tested an electron paramagnetic resonance apparatus to measure the Zeeman splitting of energy levels in Rubidium atoms	June 2015 - Present        September 2014 - June 2015        June 2013 - May 2014
PUBLICATIONS	<b>First Author Publications</b> 2. <b>Brumback, M.C.</b> , Hickox, R.C., Bachetti, M., Ballhausen, R., Fürst, F.S., Pike, S., Pottschmidt, K., Tomsick, J.A., Wilms, J. 2018. <i>ApJL</i> , 861, L7. “Discovery of pulsation dropout and turn-on during the high state of the accreting X-ray pulsar LMC X-4” 1. <b>Brumback, M.C.</b> , Hickox, R.C., Fürst, F.S., Pottschmidt, K., Hemphill, P., Tomsick, J.A., Wilms, J., Ballhausen, R. 2018. <i>ApJ</i> , 852, 132. “A Possible Phase-dependent Absorption Feature in the Transient X-Ray Pulsar SAX J2103.5+4545”	

AWARDS	<b>Fellowships</b>	
	Department of Education GAANN Fellowship	2014–2015
	Elihu Root Fellowship, Hamilton College	May 2014
	Clare Boothe Luce Undergraduate Research Award	Spring 2013
	<b>Student Awards</b>	
	Graduate Student Poster Session Winner, Dartmouth College	April 2017
	The Southworth Prize in Physics, Hamilton College	Spring 2014
	Leonard E. and Sue J. Kingsley Prize Scholarship, Hamilton College	Spring 2013
	LEADERSHIP	<b>Dartmouth Agility Club</b>
Club Leader, Dartmouth College		2017–present
<b>Graduate Student Council</b>		
General Council Department Representative, Dartmouth College	2015–2016	
PRESENTATIONS	<b>Talks</b>	
	ULX Pulsar Workshop, ESAC, Madrid, Spain	June 2018
	“Pulse dropout in LMC X-4: Bridging the gap between accretion properties in Eddington and super-Eddington pulsars”	
	NERQUAM #28, Yale University, CT	May 2018
	“Discovery of pulsation dropout and turn-on during the high state of the accreting X-ray pulsar LMC X-4”	
	NERQUAM #26, Brandeis University, MA	Jun 2016
	“Exploring the warped accretion disk around the magnetized neutron star LMC X-4”	
	<b>Posters</b>	
	Are AGN Special? The environmental dependence and global impact of AGN activity; Durham University, UK.	Aug 2018
	“Warped disks and super-Eddington outflows in X-ray binaries as analogues to AGN accretion physics”	
	AAS HEAD Meeting; Sun Valley, ID	Aug 2017
	“A flux state comparison of the transient X-ray pulsar SAX J2103.5+4545”	
	<i>NuSTAR</i> Science Meeting; Pasadena, CA	Nov 2016
	“Using <i>NuSTAR</i> to probe X-ray pulsars with warped disks and flares”	
	AAS HEAD Meeting; Naples, FL	Apr 2016
“An investigation of luminous X-ray pulsars: exploring accretion onto the magnetized neutron star LMC X-4”		
OBSERVING EXPERIENCE	<b>MDM Observatory</b>	
	Hiltner 2.4-m Telescope (2016, 3 nights; 2017, 7 nights) Spectroscopy and imaging with OSMOS	
TEACHING EXPERIENCE	<b>Teaching Assistant</b>	
	Astronomy 2/3: Exploring the Universe	Summer 2016, Fall 2016
	Physics 1/2: Understanding the Universe	Spring 2016
	Physics 3: General Physics I	Fall 2015
	Astronomy 1: Exploration of the Solar System	Spring 2015; Summer 2015, 2017
	Physics 4: General Physics II	Winter 2015
	<b>Writing Center Tutor</b>	September 2011 - May 2014
	Tutored students individually on writing skills	
	Nesbitt-Johnston Writing Center, Hamilton College	

6 hours per week

**Classroom Teaching**

September 2013 - May 2014

Assisted in seventh grade science classroom, for completion of Education Studies Minor

Wrote physics lesson plans and labs, assisted with grading and group activities at Clinton Middle School, Clinton, NY 13323

Over 100 hours of classroom experience

**SERVICE**

Meet Up Upper Valley Observing events 2018-Present  
Work with Hanover Chamber of Commerce to facilitate free observing events.  
Hanover, NH

Classroom Speaker: Pomfret School 2017  
Gave a 60 minute class lectures on galaxy evolution  
Pomfret School, Pomfret, CT

Public Observing 2017-Present  
Operate 12 inch telescopes for use by the general public.  
Shattuck Observatory, Hanover, NH

Classroom Speaker: Ledyard Charter School 2016  
Gave two 50 minute class lectures on the search for extraterrestrial life  
The Ledyard Charter School, Lebanon, NH

Guest Astronomer: Montshire Astronomy Day 2015, 2016, 2017, 2018  
Communicated to children and adults about my research and general astronomy  
The Montshire Museum of Science, Norwich, VT

**SOFTWARE**

Computer Programming  
IDL, Python, L<sup>A</sup>T<sub>E</sub>X, HTML, MATLAB, stingray

Data Reduction and Mission Specific Software  
HEASoft, Xspec, NuSTARDAS, XMMDAS

**REFERENCES**

Ryan Hickox  
Assistant Professor ryan.c.hickox@dartmouth.edu  
Department of Physics & Astronomy (603) 646-2962  
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Robert Fesen  
Professor and Graduate Committee Chair robert.a.fesen@dartmouth.edu  
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