

Dr. Tyler A. Pritchard

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Education	The Pennsylvania State University 2014 Ph.D in Astronomy & Astrophysics <i>The UV Properties of Core-Collapse Supernovae</i> Advisor: Dr. Pete Roming
	The University of California Berkeley 2008 B.A.s in Physics, Astrophysics
Research Interests	My primary research interests are understanding the end point of massive star evolution through Time-Domain Explosive Transients studies and transient & variable star identification and classification methods in the era of big data where I use multi-wavelength observations of astronomical transients to understand their progenitors, and often times extreme physics, that drive them. With astronomical data growing increasingly large, it has also become increasingly important to develop new tools and techniques to detect and classify transients so that we may discover the rare or unusual events that allow us to gain new insights. My current and previous research has included: Discovery of anomalous and outlier events in time-domain data streams with the Anomalies & outlier LSST alert broker team, Fast Evolving Transients and progenitors of stripped-envelope supernovae with rapid, early observations, high-cadence transient and variable star observations with TESS, Fast, or early, transients & multi-messenger astrophysics with the Deeper Wider Faster (DWF) program, High-Redshift Superluminous Supernovae and hosts with Survey Using DECam for Superluminous Supernovae (SUDSS) program, and UV properties of core-collapse supernovae with the Swift satellite
Research Positions	Postdoctoral Research Fellow 09/2018-Present New York University Postdoctoral Research Fellow 2014 - 2017 Swinburne University of Technology Graduate Research Assistant 2008-2014 The Pennsylvania State University Undergraduate Research Assistant 2006-2008 UC Berkeley Advisor: Saul Perlmutter 2007-2008 <i>Gravitational Lensing Magnification of z=1-1.5 Type Ia SNe</i> UC Berkeley Advisor: Weidong Li 2008 <i>LOSS: Follow up Observations of SNe with the 1m Nickel</i> UC Berkeley Advisor: George Smoot 2006 <i>Weak Lensing in the GOODS Field</i>
Major Projects & Science Collaborations	Member LSST Transient and Variable Stars Working Group 2018-Present <i>Fast Transients, Supernovae & Classification</i> Member Global Supernovae Project 2018-Present <i>CCSNe, SLSNe, Fast Blue Optical Transients</i> Member SUDSS 2014-Present <i>Detection, Classification & Characterization of High-z SLSNe</i> Member Deeper, Wider, Faster 2015-Present <i>Exploration of transients on the minutes-hours-days timescales</i>

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Projects & Collaborations (continued)	Co-Investigator NASA ADAP <i>The UV/Optical Properties of Core Collapse Supernovae</i>	2012-2014
	Member Swift & UVOT Science Operations Team <i>Science Planning, Observatory Support & Tools Development</i>	2009-2014
	Primary Investigator Hobby-Eberly Telescope <i>HET Spectra of Swift Supernovae</i>	2009-2013
	Co-Investigator Graduate Student VLA <i>Observations of Historic Supernovae in M83 using the eVLA</i>	2012-2013
	Scientist Swift UVOT Duty Scientist <i>UVOT Monitoring, Emergency Response and Risk Analysis</i>	2011-2013

Significant Grants & Awards	TESS Cycle 3 Guest Investigator <i>THE GROUND TRUTH: AUTOMATIC CROSS-CALIBRATION OF TESS AND GROUND BASED PHOTOMETRY FOR TRANSIENT HIGHLY VARIABLE EVENTS</i> \$50k, Principal Investigator	2020
	Swift Cycle 16 Guest Investigator <i>MULTI-WAVELENGTH CHARACTERIZATION OF YOUNG FAST EVOLVING TRANSIENTS FOR LSST AND BEYOND</i> \$40k, Principal Investigator	2020
	LSSTC Enabling Science Award <i>Anomalies, Outliers & Unknown-Unknowns – an LSST workshop to accelerate the discovery of truly novel events in the LSST alert data-stream.</i> \$5k, Principal Investigator	2020
	Swift Cycle 11, 12, 13 Guest Investigator <i>MULTI-WAVELENGTH CHARACTERIZATION OF YOUNG FAST EVOLVING TRANSIENTS FOR LSST AND BEYOND</i> Unfunded (international) Principal Investigator	2014 - 2016
	Gemini 2015B <i>Spectroscopic Observations of High-z Superluminous Supernovae</i> Unfunded Principal Investigator	2015
	NASA Archival Data Analysis Program <i>The UV/Optical Properties of Core Collapse Supernovae</i> \$300k, Funded Co-Investigator; Principal Investigator Pete Roming	2012
	Hobby – Eberly Telescope <i>HET Spectra of Swift Supernovae</i> Unfunded, Principal Investigator	2009 - 2013
	NSF East Asia Pacific Studies Institute Summer Fellow	2013
	NSF Graduate Student Fellowship- Honorable Mention	2010
	PSU Braddock- Roberts Fellowship	2008

Research Experience	Awarded Time	<i>Swift</i>	<i>Keck</i>	<i>TESS</i>
		Hobby-Eberly Telescope	HST	
		South-African Large Telescope	Gemini	
	Observed With	<i>Swift</i> - UVOT, XRT	Keck – Nirc2, MOSFIRE	
		EVLA - C,L Bands	CTIO-4m - DECam	
	Nickel - DIC	Gemini – GMPS & F2		
Data Reduction And/or Analysis	<i>Swift</i> – UVOT, XRT	Keck – Nirc2		
	HET – LRS	CTIO-4m - DECam		
	SALT – RSS	Gemini – GMOSS		
	EVLA C,L Bands	TESS		
	Nickel - DIC			
Languages	IDL, IRAF, Python + Scikit-learn, C++, Java, Fortran			

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Teaching & Advising	Assisting Supervisor (Mentor)		2015-2019
	Chris Curtin:	PhDT: Finding z~2-4 SLSNe with SUDSS	
		Swinburne University	
	Assisting Supervisor (Mentor)		2015-2018
	Igor Andreoni:	PhDT: <i>Probing the extragalactic fast transient sky at minute timescales</i>	
		Swinburne University	
	Teaching Assistant		2009
	Astronomy 01 General Education		
	Astronomy Laboratory Instructor		2009
	Astronomy 011- General Education		
	Instructed rooftop observing labs for a variety of courses		
	Undergraduate Teaching Assistant		2008
	UC Berkeley Radio Astronomy Laboratory		
Diversity & Outreach	Astrofest Contributor		2008-2011
	Assisting in the design, preparation and production of a twice-yearly public outreach event that draws thousands of participants from the general public		
	Outreach Education		2008-2011
	Presented lectures and conducted hands-on laboratory demonstrations for students from grades 3-12 as part of PSU's ongoing commitment to public outreach and education.		
	Observatory Educator		2008-2011
	Led public observing nights		
Professional & Service	Member	Associations	
		<i>American Astronomical Society</i>	2007-Present
		<i>New York Academy of Sciences</i>	2019-Present
	Referee	Journal	
		<i>Nature</i>	<i>ApJ</i>
		<i>Nature Astronomy</i>	<i>MNRAS</i>
	Referee	Time Allocation Committee	
		<i>LCO-TOM Time & Funding</i>	2019
	Meeting	Scientific Organizing Committee	
		<i>Anomalies, Outliers & Unknown-Unknowns in LSST</i>	2021*
	<i>Gotham Time Domain Workshop</i>	2020	
	<i>Swinburne-CalTech Collaboration Meeting</i>	2017	
	<i>Subaru Telescope 20th Anniversary:</i>	2019	
	<i>Time-Domain Astronomy in the Multi-Messenger Era</i>		
Invited Talks	Keck Wide Field Imager Workshop		December, 2019
	Pasadena, Ca		
	<i>"High Redshift Superluminous Supernovae at the Epoch of Reionization"</i>		
	Kyoto University Colloquium		August, 2018
	Kyoto, Japan		
	<i>"Deeper, Wider, Faster – Real Time Multi-Messenger/Wavelength Transient Discovery"</i>		
	National Astronomical Observatory of Japan Seminar		August, 2018
	Mitaka, Japan		
	<i>"Deeper, Wider, Faster – Real Time Multi-Messenger/Wavelength Transient Discovery"</i>		
	Konan University Colloquium		July, 2018
Kobe, Japan			
<i>"Deeper, Wider, Faster – Real Time Multi-Messenger/Wavelength Transient Discovery"</i>			
Kiso-Schmidt Symposium		June, 2018	
Kiso, Japan			
<i>"Deeper, Wider, Faster – Real Time Multi-Messenger/Wavelength Transient Discovery"</i>			

**First & Second
Author Peer
Reviewed**

Pritchard, T. A. et al. 2020, *subm.*

The Exotic Type Ic Broad-Lined Supernova SN 2018gcp:

Breaking the Barrier Between Supernovae and Fast Optical Transients

<https://arxiv.org/abs/2008.04321>

Vohl, D., Pritchard, T. A. & coauthors 2017, PASA, 34, 38

Enabling Near Real-Time Remote Search for Fast Transient Events with Lossy Data Compression

Pritchard, Tyler Anthony, PhDT, 191P

Ultraviolet Observations of Core-Collapse Supernovae

Pritchard, T. A. et al. 2014, ApJ, 787, 15

Bolometric and UV Light Curves of Core-Collapse Supernovae

Bayless, Amanda J., Pritchard, T. A & coauthors 2013, ApJ, 764L, 13

The Long-lived UV "Plateau" of SN 2012aw

Pritchard, T. A. & Roming P. W. A. 2012, IAUS, 279, 383P

Early Time Bolometric Light Curves of Type-II Supernovae Observed by Swift

***Roming, P. W. A., Pritchard, T. A. & coauthors 2012, ApJ, 751, 92R**

The Unusual Temporal and Spectral Evolution of the Type II_n Supernova 2011ht

Pritchard, T. A. et al. 2012, ApJ, 750, 128

Early Ultraviolet Observations of a Type II_n Supernova (2007pk)

Roming, P. W. A., Pritchard, T. A. & coauthors 2009, ApJ, 704L, 118

Multi-Wavelength Properties of the Type II_b SN 2008ax

**First Author
Invited
Comments**

Pritchard, T. A. 2019, Nat. Astron., *submitted*

GW170817 – Two Years Later

<https://www.overleaf.com/7414686751bhwpqjkhvptd>

Pritchard, T. A. 2017, Nat. Astron., 748, 1

How to Light Up A Black Hole

**Mentee's First
Author Peer
Reviewed**

Andreoni, Igor & coauthors including Pritchard, Tyler A. 2020, MNRAS, 491, 5852

Probing the extragalactic fast transient sky at minute timescales with DECam

Curtin, Chris & coauthors including Pritchard, T. A. 2019, ApJS, 241, 17C

FIRST RELEASE OF HIGH-REDSHIFT SUPERLUMINOUS SUPERNOVAE FROM THE SUBARU HIGH-Z SUPERNOVA CAMPAIGN (SHIZUCA).

II. SPECTROSCOPIC PROPERTIES.

Andreoni, I. & coauthors including Pritchard, T. A. 2017, PASA, 34, 69

Follow up of GW170817 and its electromagnetic counterpart by Australian-led observing programs

Andreoni, I. & coauthors including Pritchard, T. A. 2017, PASA, 34, 37

Mary, a Pipeline to Aid Discovery of Optical Transients

**Coauthor
Publications**

Webb, Sara & coauthors including Tyler A. Pritchard, 2020, MNRAS, in press.

Unsupervised machine learning for transient discovery in Deeper, Wider, Faster light curves

*** Significant
Contributions**

Wolfgang E. Kerzendorf & coauthors including Tyler A. Pritchard, 2019, Nature Astronomy, 2020 Nat. Astro., 82

DeepThought DPR: Distributed peer review enhanced with natural language processing and machine learning

***Andreoni, Igor & coauthors including Pritchard, Tyler A. 2019, PASP, 131f8004A**

A Strategy for LSST to Unveil a Population of Kilonovae without Gravitational-wave Triggers

***Bianco, Federica B., Drout, Maria R., Graham, Melissa L., Pritchard, Tyler A. & coauthors 2019, PASP, 131f8002B**

Presto-Color: A Photometric Survey Cadence for Explosive Physics and Fast Transients

Coauthor Publications (continued)

* Significant Contributions

Moriya, Takashi & coauthors including Pritchard, T. A. 2019, ApJ, 882, 70M
HSC16aayt: A Slowly Evolving Interacting Transient Rising for More than 100 Days

***Moriya, Takashi & coauthors including Pritchard, T. A. 2019, ApJS, 241, 16M**
FIRST RELEASE OF HIGH-REDSHIFT SUPERLUMINOUS SUPERNOVAE FROM THE SUBARU HIGH-Z SUPERNOVA CAMPAIGN (SHIZUCA). I. PHOTOMETRIC PROPERTIES.

Bhandari, S & coauthors including Pritchard, T. A. 2018, MNRAS, 475, 1427B
The SURvey for Pulsars and Extragalactic Radio Bursts II: New FRB discoveries and their follow-up

Buckley, David A. H. & coauthors including Pritchard, T. A. 2018, MNRAS, 474, 71B
A comparison between SALT/SAAO observations and kilonova models for AT 2017gfo: the first electromagnetic counterpart of a gravitational wave transient - GW170817

McCully, Curtis & coauthors including Pritchard, T. A. 2017, ApJ, 848, 32
The Rapid Reddening and Featureless Optical Spectra of the Optical Counterpart of GW170817, AT 2017gfo, during the First Four Days

Abbott, B. P. & coauthors including Pritchard, T. A. 2017, ApJ, 848, 12
Multi-messenger Observations of a Binary Neutron Star Merger

Petroff, E. & coauthors including Pritchard, T. A. 2017, MNRAS, 469, 4465
A polarized fast radio burst at low Galactic latitude

Meade, Bernard & coauthors including Pritchard, T. A. 2017, PASA, 34, 23
Collaborative Workspaces to Accelerate Discovery

Parrent, J. T. & coauthors including Pritchard, T. A. 2016, MNRAS, 457, 3702P
Comparative analysis of SN 2012dn optical spectra: days -14 to +114

***De la Rosa, Janie & coauthors including Pritchard, T. A. 2016, ApJ, 820, 74D**
Characterizing Mid-ultraviolet to Optical Light Curves of Nearby Type II_n Supernovae

Smith, M. & coauthors including Pritchard, T. A. 2016, ApJ, 818L, 8S
DES14X3taz: A Type I Superluminous Supernova Showing a Luminous, Rapidly Cooling Initial Pre-peak Bump

***Brown, Peter J. & coauthors including Pritchard, T. A. 2014, ApSS, 354, 89B**
SOUSA: the Swift Optical/Ultraviolet Supernova Archive

Dall'Ora, M & coauthors including Pritchard, T. A. 2014, ApJ, 787, 139D
The Type IIP Supernova 2012aw in M95: Hydrodynamical Modeling of the Photospheric Phase from Accurate Spectrophotometric Monitoring

Maselli, A & coauthors including Pritchard, T. 2014, Sci, 343, 48M
GRB 130427A: A Nearby Ordinary Monster

Margutti, R & coauthors including Pritchard, T. 2014, ApJ, 780, 21
A Panchromatic View of the Restless SN 2009ip Reveals the Explosive Ejection of a Massive Star Envelope

***Morii, M. & coauthors incl. Pritchard, T. A. 2013, ApJ, 779, 118**
Extraordinary Luminous Soft X-Ray Transient MAXI J0158–744 as an Ignition of a Nova on a Very Massive O-Ne White Dwarf

Marion, G. H. & coauthors incl. Pritchard, T. A. 2013, ApJ, 777, 40
High-velocity Line Forming Regions in the Type Ia Supernova 2009ig

Whalen, Daniel J. & coauthors incl. Pritchard, T. A. 2013, ApJ, 768, 195
Illuminating the Primeval Universe with Type II_n Supernovae

**Coauthor
Publications
(continued)**

Humphreys, Roberta M. & coauthors incl. Pritchard, T. A. 2012, ApJ, 760, 93
The Unusual Temporal and Spectral Evolution of SN2011ht. II. Peculiar Type II_n or Impostor?

Oates, S. R. & coauthors including Pritchard, T. 2012 MNRAS, 424, 1297
Multiwavelength observations of the Type II_b supernova 2009mg

*** Significant
Contributions**

***Suzuki, N. & coauthors including Pritchard, T. A. 2012, 746, 85**
The Hubble Space Telescope Cluster Supernova Survey. V. Improving the Dark-Energy Constraints above $z > 1$ and Building an Early-type-hosted Supernovae Sample

Brown, Peter J. & coauthors incl. Pritchard, T. A. 2010, ApJ, 721, 1608
The Absolute Magnitudes of Type Ia Supernovae in the Ultraviolet

***Ganeshalingam, Mohan & coauthors incl. Pritchard, T. A. 2010, ApJS, 190, 418**
Results of the Lick Observatory Supernova Search Follow-up Photometry Program: BVRI Light Curves of 165 Type Ia Supernovae

***Dawson, K. S. & coauthors including Pritchard, T. A. 2009, AJ, 138, 1271**
An Intensive Hubble Space Telescope Survey for $z > 1$ Type Ia Supernovae by Targeting Galaxy Clusters