

# Simon J. Murphy

## Current Position

July 2020– **Casual Academic**, School of Science, UNSW Canberra

As a physics tutor and laboratory demonstrator I lead first-year tutorial classes and supervise weekly laboratory sessions where students learn the fundamentals of the subject. I have also developed second-year astrophysics laboratory projects on the Sun and Eclipsing Binary stars, and supervised a short undergraduate research project.

My own research is focused on identifying and characterising some of the youngest stars in the Solar neighbourhood using a variety of observational techniques. These young, nearby systems are ideal laboratories for understanding early stellar evolution and probing the diverse conditions under which stars and, importantly, *planets* form.

## Professional History

2019–2020 **Postdoctoral Researcher**, School of Science, UNSW Canberra

2016–2019 **Vice Chancellor's Postdoctoral Fellow**, School of Science, UNSW Canberra

2015 **SkyMapper Postdoctoral Fellow**, Research School of Astronomy & Astrophysics, ANU

2013–2014 **Gliese Fellow**, Astronomisches Rechen-Institut, University of Heidelberg, Germany

2012 **Postdoctoral Fellow**, Research School of Astronomy & Astrophysics, ANU

## Education

2007–2011 **Ph.D.**, Australian National University, Canberra (awarded July 13, 2012)

thesis *"Revealing the Chamaeleon: Young, low-mass stars surrounding  $\eta$  and  $\epsilon$  Chamaeleontis"*

supervisor Professor Michael Bessell (ANU)

2006 **B.Sc. (First Class Honours)**, Australian National University, Canberra

2003–2005 **B.Sc. (Astronomy)**, University of Canterbury, Christchurch, New Zealand

## Teaching Experience

2021 Tutor and lab demonstrator, ZPEM1501 *Physics 1A*, UNSW Canberra

2020 Tutor and lab demonstrator, ZPEM1501(2) *Physics 1A(B)*, UNSW Canberra

Lab demonstrator, ZPEM2509 *Astrophysics*, UNSW Canberra

I developed two online labs on the Sun and Eclipsing Binary stars

Supervisor, ZPEM1901 *Contemporary Issues in Science*, UNSW Canberra, (4 week first-year research project for CDF students)

## Publication Summary

2008– Refereed publications: **35** (32 in UNSW Q1 journals)

First-author publications: **8** Second-author: **5**

Career  $h$ -index: **20** ( $h$  publications with at least  $h$  citations)

Career citations: **1166**; via NASA ADS.

## Research Interests

- Low-mass star formation and early stellar evolution
- Accretion and circumstellar disc evolution
- Stellar age diagnostics
- Eclipsing binaries as tests of stellar models
- Star clusters, moving groups and associations
  - New members (especially at lowest masses)
  - Stellar kinematics, dynamical evolution of young groups
- Data science; knowledge discovery from large data sets
- Scientific exploitation of the global *Virtual Observatory* initiative

## Key Research Proficiencies

- Development and exploitation of large astronomical databases (e.g. *SkyMapper*)
- Analysis of stellar age diagnostics
- Extensive programming experience (Python–expert, web, databases, Perl, Javascript)
- Optical spectroscopy (low–high resolution)
- Integral-field spectroscopy and data reduction
- Optical imaging and photometry
- Applications of stellar and Galactic kinematics
- Astronomical data reduction packages (incl. IRAF, PyRAF, Figaro)
- Development and use of *Virtual Observatory* tools and web services

## Selected Awards & Prizes

- 2016–2019 Vice Chancellor's Postdoctoral Fellowship, University of New South Wales
- 2013–2014 Gliese Postdoctoral Fellowship, University of Heidelberg
- 2012 Honourable Mention, ASA Charlene Heisler Prize for best Australian astronomy thesis
- 2007–2011 Joan Duffield Research Scholarship, ANU
  - 2011 Vice Chancellor's Award for Community Outreach, ANU
- 2007 Vice Chancellor's Special Award for Outreach, ANU
- 2006 Bart J. Bok Honours Year Scholarship, ANU

## Refereed Publications

As of May 2021 I am an author of **35** peer-reviewed articles, including **13 first or second author** publications.

**Career  $h$ -index: 20** ( $h$  publications with at least  $h$  citations).

**Career citations: 1166; via NASA ADS.**

*NB: My research output was reduced in 2017–2018 as I took leave and moved to part-time hours (0.6 FTE, then 0.8 FTE until June 2020) following the birth of my first child.*

- 2021 — *Magnetorotational hypernovae are another astronomical  $r$ -process site*  
Yong, D., Kobayashi, C., Da Costa, G. S., Bessell, M. S., Chiti, A., Frebel, A., Lind, K., Mackey, A. D., Nordlander, T., Asplund, M., Casey, A. R., Marino, A. F., **Murphy, S. J.**, & Schmidt, B. P.  
Accepted for publication in *Nature* (4 May), 2021.
- *Exploring the Galaxy's halo and very metal-weak thick disc with SkyMapper and Gaia DR2*  
Cordoni, G., Da Costa, G. S., Yong, D., Mackey, A. D., Marino, A. F., Monty, S., Nordlander, T., Norris, J. E., Asplund, M., Bessell, M. S., Casey, A. R., Frebel, A., Lind, K., **Murphy, S. J.**, et al.  
*Monthly Notices of the Royal Astronomical Society*, 2021, 503(2), 2539.
- 2020 — *THOR 42: A touchstone ~24 Myr-old eclipsing binary spanning the fully convective boundary*  
**Murphy, S. J.**, Lawson, W. A., Onken, C. A., Yong, D., Da Costa, G. S., Zhou, G., Mamajek, E. E., Bell, C. P. M., Bessell, M. S., & Feinstein, A. D.  
*Monthly Notices of the Royal Astronomical Society*, 2020, 491(4), 4902.
- *Sporadic and intense accretion in a 1 Myr-old brown dwarf candidate*  
Nguyen-Thanh, D., Phan-Bao, N., **Murphy, S. J.**, & Bessell, M. S.  
*Astronomy & Astrophysics*, 2020, 634, A128.
- *2MASS J15460752-6258042: a mid-M dwarf hosting a prolonged accretion disc*  
Lee, J., Song, I., & **Murphy, S.**  
*Monthly Notices of the Royal Astronomical Society*, 2020, 494(1), 62.
- *The closest extremely low-mass white dwarf to the Sun*  
Kawka, A., Simpson, J. D., Vennes, S., Bessell, M. S., Da Costa, G. S., Marino, A. F., & **Murphy, S. J.**  
*Monthly Notices of the Royal Astronomical Society*, 2020, 495(1), L129.
- *A kinematically unbiased, all-sky search for nearby, young, low-mass stars*  
Binks, A. S., Chalifour, M., Kastner, J. H., Rodriguez, D., **Murphy, S. J.**, Principe, D. A., Punzi, K., Sacco, G. G., & Hernández, J.  
*Monthly Notices of the Royal Astronomical Society*, 2020, 491(1), 215.
- 2019 — *The lowest detected stellar Fe abundance: the halo star SMSS J160540.18-144323.1*  
Nordlander, T., Bessell, M. S., Da Costa, G. S., Mackey, A. D., Asplund, M., Casey, A. R., Chiti, A., Ezzeddine, R., Frebel, A., Lind, K., Marino, A. F., **Murphy, S. J.**, Norris, J. E., Schmidt, B. P., & Yong, D.  
*Monthly Notices of the Royal Astronomical Society*, 2019, 488(1), L109.
- *Keck HIRES spectroscopy of SkyMapper commissioning survey candidate extremely metal-poor stars*  
Marino, A. F., Da Costa, G. S., Casey, A. R., Asplund, M., Bessell, M. S., Frebel, A., Keller, S. C., Lind, K., Mackey, A. D., **Murphy, S. J.**, Nordlander, T., Norris, J. E., Schmidt, B. P., & Yong, D.  
*Monthly Notices of the Royal Astronomical Society*, 2019, 485(4), 5153.

- *Detection of a giant flare displaying quasi-periodic pulsations from a pre-main-sequence M star by the Next Generation Transit Survey*  
Jackman, J. A. G., Wheatley, P. J., Pugh, C. E., Kolotkov, D. Y., Broomhall, A.-M., Kennedy, G. M., **Murphy, S. J.**, et al.  
Monthly Notices of the Royal Astronomical Society, 2019, 482(4), 5553.
- *The Planet Formation Potential around a 45 Myr Old Accreting M Dwarf*  
Flaherty, K., Hughes, A. M., Mamajek, E. E., & **Murphy, S. J.**  
Astrophysical Journal, 2019, 872(1), 92.
- *The SkyMapper DR1.1 search for extremely metal-poor stars*  
Da Costa, G. S., Bessell, M. S., Mackey, A. D., Nordlander, T., Asplund, M., Casey, A. R., Frebel, A., Lind, K., Marino, A. F., **Murphy, S. J.**, Norris, J. E., Schmidt, B. P., & Yong, D.  
Monthly Notices of the Royal Astronomical Society, 2019, 489(4), 5900.
- 2018 — *SkyMapper Southern Survey: First Data Release (DR1)*  
Wolf, C., Onken, C. A., Luvaul, L. C., Schmidt, B. P., Bessell, M. S., Chang, S.-W., Da Costa, G. S., Mackey, D., Martin-Jones, T., **Murphy, S. J.**, et al.  
Publications of the Astronomical Society of Australia, 2018, 35, e010.
- *WISE J080822.18-644357.3 - a 45 Myr-old accreting M dwarf hosting a primordial disc*  
**Murphy, S. J.**, Mamajek, E. E., & Bell, C. P. M.  
Monthly Notices of the Royal Astronomical Society, 2018, 476, 3290.
- 2017 — *A stellar census of the nearby, young 32 Orionis group*  
Bell, C. P. M., **Murphy, S. J.**, & Mamajek, E. E.  
Monthly Notices of the Royal Astronomical Society, 2017, 468, 1198.
- 2016 — *A nearby young M dwarf with a wide, possibly planetary-mass companion*  
Deacon, N. R., Schlieder, J. E., & **Murphy, S. J.**  
Monthly Notices of the Royal Astronomical Society, 2016, 457, 3191.
- *The ANU WiFeS SuperNova Programme (AWSNAP)*  
Childress, M. J., Tucker, B. E., Yuan, F., Scalzo, R., Ruiter, A., Seitzzahl, I., Zhang, B., Schmidt, B., Anguiano, B., Aniyan, S., Bayliss, D. D. R., Bento, J., Bessell, M., Bian, F., Davies, R., Dopita, M., Fogarty, L., Fraser-McKelvie, A., Freeman, K., Kuruwita, R., Medling, A. M., **Murphy, S. J.**, et al.  
Publications of the Astronomical Society of Australia, 2016, 33, e055.
- 2015 — *New members of the TW Hydrae Association and two accreting M-dwarfs in Scorpius-Centaurus*  
**Murphy, S. J.**, Lawson, W. A., & Bento, J.  
Monthly Notices of the Royal Astronomical Society, 2015, 453, 2220.
- *A  $0.24 \pm 0.18 M_{\odot}$  double-lined eclipsing binary from the HATSouth survey*  
Zhou, G., Bayliss, D., Hartman, J. D., Rabus, M., Bakos, G. Á., Jordán, A., Brahm, R., Penev, K., Csabry, Z., Mancini, L., Espinoza, N., de Val-Borro, M., Bhatti, W., Ciceri, S., Henning, T., Schmidt, B., **Murphy, S. J.**, et al.  
Monthly Notices of the Royal Astronomical Society, 2015, 451, 2263.
- *New low-mass members of the Octans stellar association and an updated 30-40 Myr lithium age*  
**Murphy, S. J.** & Lawson, W. A.  
Monthly Notices of the Royal Astronomical Society, 2015, 447, 1267.
- 2014 — *Evolution from protoplanetary to debris discs: the transition disc around HD 166191*  
Kennedy, G. M., **Murphy, S. J.**, Lisse, C. M., Ménard, F., Sitko, M. L., Wyatt, M. C., Bayliss, D. D. R., DeMeo, F. E., Crawford, K. B., Kim, D. L., Rudy, R. J., Russell, R. W., Sibthorpe, B., Skinner, M. A., & Zhou, G.  
Monthly Notices of the Royal Astronomical Society, 2014, 438, 3299.

- 2013 — *Copious Amounts of Hot and Cold Dust Orbiting the Main Sequence A-type Stars HD 131488 and HD 121191*  
Melis, C., Zuckerman, B., Rhee, J. H., Song, I., **Murphy, S. J.**, & Bessell, M. S.  
Astrophysical Journal, 2013, 778, 12.
- *Re-examining the membership and origin of the  $\epsilon$  Cha association*  
**Murphy, S. J.**, Lawson, W. A., & Bessell, M. S.  
Monthly Notices of the Royal Astronomical Society, 2013, 435, 1325.
- *The GALEX Nearby Young-Star Survey*  
Rodriguez, D. R., Zuckerman, B., Kastner, J. H., Bessell, M. S., Faherty, J. K., & **Murphy, S. J.**  
Astrophysical Journal, 2013, 774, 101.
- *A High-resolution Spectroscopic Search for the Remaining Donor for Tycho's Supernova*  
Kerzendorf, W. E., Yong, D., Schmidt, B. P., Simon, J. D., Jeffery, C. S., Anderson, J., Podsiadlowski, P., Gal-Yam, A., Silverman, J. M., Filippenko, A. V., Nomoto, K., **Murphy, S. J.**, et al.  
Astrophysical Journal, 2013, 774, 99.
- *The Most Metal-poor Stars. I. Discovery, Data, and Atmospheric Parameters*  
Norris, J. E., Bessell, M. S., Yong, D., Christlieb, N., Barklem, P. S., Asplund, M., **Murphy, S. J.**, et al.  
Astrophysical Journal, 2013, 762, 25.
- 2012 — *Rapid disappearance of a warm, dusty circumstellar disk*  
Melis, C., Zuckerman, B., Rhee, J. H., Song, I., **Murphy, S. J.**, & Bessell, M. S.  
Nature, 2012, 487, 74.
- *RX J0942.7-7726AB: an isolated pre-main-sequence wide binary*  
**Murphy, S. J.**, Lawson, W. A., & Bessell, M. S.  
Monthly Notices of the Royal Astronomical Society, 2012, 424, 625.
- *2M1155-79 (= T Chamaeleontis B): A Low-mass, Wide-separation Companion to the nearby, "Old" T Tauri Star T Chamaeleontis*  
Kastner, J. H., Thompson, E. A., Montez, R., **Murphy, S. J.**, Bessell, M. S., & Sacco, G.  
Astrophysical Journal, Letters, 2012, 747, L23.
- *Spectrophotometric Libraries, Revised Photonic Passbands, and Zero Points for UBVRI, Hipparcos, and Tycho Photometry*  
Bessell, M. & **Murphy, S.**  
Publications of the Astronomical Society of the Pacific, 2012, 124, 140.
- 2011 — *The Solar Neighborhood. XXVI. AP Col: The Closest (8.4 pc) Pre-main-sequence Star*  
Riedel, A. R., **Murphy, S. J.**, Henry, T. J., Melis, C., Jao, W.-C., & Subasavage, J. P.  
Astronomical Journal, 2011, 142, 104.
- *Episodic disc accretion in the halo of the 'old' pre-main-sequence cluster  $\eta$  Chamaeleontis*  
**Murphy, S. J.**, Lawson, W. A., Bessell, M. S., & Bayliss, D. D. R.  
Monthly Notices of the Royal Astronomical Society, 2011, 411, L51.
- 2010 — *First detection of a low-mass stellar halo around the young open cluster  $\eta$  Chamaeleontis*  
**Murphy, S. J.**, Lawson, W. A., & Bessell, M. S.  
Monthly Notices of the Royal Astronomical Society, 2010, 406, L50.
- 2009 — *Extending the Virgo Stellar Stream with SEKBO Survey RR Lyrae Stars*  
Prior, S. L., Da Costa, G. S., Keller, S. C., & **Murphy, S. J.**  
Astrophysical Journal, 2009, 691, 306.
- 2008 — *Revealing Substructure in the Galactic Halo: The SEKBO RR Lyrae Survey*  
Keller, S. C., **Murphy, S.**, Prior, S., DaCosta, G., & Schmidt, B.  
Astrophysical Journal, 2008, 678, 851.