Stephanie Monty

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Research Interests

Galactic archaeology, high precision stellar chemical abundances, globular cluster dynamics, adaptive optics, Milky Way dynamics, near-field cosmology

Current Position

Postdoctoral Researcher Institute of Astronomy, Cambridge University
October 2022 -
Member of the Stellar Streams group, working on own my research interests in collaboration with group members. Funded by The Leverhulme Trust.
Supervisors: Prof. Vasily Belokruov and Prof. Wyn Evans.

Education

Doctor of Philosophy (Astrophysics) Australian National University
October 2018 - October 2022 Thesis submitted for examination

Thesis Title: *Star Cluster Formation & Galaxy Assembly: from Instrumentation, to Observations and Simulations*
Supervisors: Em.Prof. Ken Freeman, Prof. François Rigaut, Dr. David Yong, Dr. J. Trevor Mendel

Bachelor of Science (Honours) University of Victoria (Canada)
September 2012 - April 2018
Combined Major in Astronomy & Physics, Minor in Mechanical Systems

Thesis Title: *Binary Population Characterisation in the Milky Way Globular Clusters NGC 3201 & NGC 2298 from Near-IR Adaptive Optics Data*
Supervisors: Prof. Kim Venn, Prof. Thomas Puzia, Adj. Prof Peter Stetson

Honors and Scholarships

NSERC PGS-D (Natural Sciences & Research Council of Canada)	2020
Olin J Eggen Research Award (ANU)	2020
Award for Space Plasma, Astronomy & Astrophysics (ANU)	2019
HDR Fee Remission Merit Scholarship (ANU)	2018
International Student Scholarship (ANU)	2018
NTCO-CREATE Studentship (UVic)	2017
NSERC USRA (Natural Sciences & Research Council of Canada)	2017
Faculty of Science Honours Fest First Place (UVic)	2017
Physics and Astronomy Co-op Student of the Year (UVic)	2016
Entrance Scholarship (UVic)	2012

Refereed Publications

• **Monty S.**, Yong D., Massari D., McKenzie M., Myeong G. C., Buder S., Karakas A. I., Freeman K. C., Marino A. F., Belokurov V., Evans W. submitted to MNRAS

• Ciucă I., Kawata D., Ting Y-S., Grand R. J. J., Miglio A. Hayden M. et al. including **Monty, S**, submitted to MNRAS

• Simunovic M., Puzia T. H, Miller B., Carrasco E.R., Dotter A., Cassisi S, **Monty, S**, submitted to ApJ

• **Monty S.**, Yong D., Marino A. F., Karakas A. I., McKenzie M., Grundahl F., Mura-Guzmán A., 2022, accepted for publication in MNRAS

• McKenzie M., Yong D., Marino A. F., **Monty S.**, Wang E. et al., 2022, MNRAS, 516, 3

• Alencastro Puls, A., Casagrande, L., **Monty, S.**, Yong, D. et al., 2022 MNRAS, 510, 2

• Buder, S., Lind, K., Ness, M. K., Feuillet, D. K., Horta, D., **Monty, S** et al., 2022, MNRAS, 510, 2

• **Monty, S**, Rigaut, F, McDermid, R., Baumgardt, H. Cranney J., et al., 2021, MNRAS 507, 2

• Cordoni, G., Da Costa, G. S., Yong, D., Mackey, A. D., Marino, A. F., **Monty, S** et al. 2021, MNRAS, 503, 2539

• **Monty, S.**, Venn, K. A., Lane, J. M. M., Lokhorst, D. and Yong, D., 2020, MNRAS, 497, 1236

• **Monty, S.**, Puzia, T. H., Miller, B. W., Carrasco, E. R., Simunovic M. et al., 2018, ApJ, 865, 160

• Fabbro, S., Venn, K. A., O'Briain, T., Bialek, S., Kielty, C. L., Jahandar, F. and **Monty, S**, 2018, MNRAS, 475, 2978

• Bannister, M. T. Kavelaars, J. J., Petit, J-M., Gladman, B. J. et al. including **Monty, S**, 2016, AJ, 152, 70

Non-Refereed Publications

• Hansen J. T., Ireland M .J., Travouillon T., Wade S., Ellis M. et al. including **Monty, S**, 2022, SPIE Conference Series p. 121831B

• Cranney J., Haynes D., Vaughn, I., Mendel, T., **Monty S.** et al. 2022, SPIE Conference Series p. 1218567

• **Monty, S**, Rigaut, F, McDermid, R., Cranney, J., 2020, SPIE Conference Series. p. 1144756

• Ellis, S., McDermid, R., Cresci, G., Schwab, C., et al. including **Monty, S.**, 2020, in SPIE Conference Series. p. 11447A0

• Rigaut, F., McDermid, R., Cresci, G., Viotto, V. et al. including **Monty, S.**, 2020, SPIE Conference Series. p. 114471R

• McDermid, R. M., Cresci, G., Rigaut, F., Bouret, J-C. et al. including **Monty, S**, 2020, arXiv:2009.09242

• Hill, A., Flagey, N., McConnachie, A., Szeto, K. et al. including **Monty, S**, 2018, arXiv:1810.08695

• **Monty, S.**, Jahandar, F., Lee, J., Venn, K. A. et al., 2018, SPIE Conference Series Vol.10702, Ground-based and Airborne Instrumentation for Astronomy VII.p. 107027I

• Kielty, C. L., Bialek, S., Fabbro, S., Venn, K. A. et al. including **Monty, S**, 2018 SPIE Conference Series Vol.10707, Software and Cyberinfrastructure for Astronomy V. p. 107072W

• Venn, K., Erickson, D., Crampton, D., Pawluczyk, R. et al. including **Monty, S**, 2018, SPIE Conference Series Vol.10702, Ground-based and Airborne Instrumentation for Astronomy VII.p. 107027S

Research Experience

CREATE Student: Characterising Mauna Kea Spectroscopic Explorer Candidate Fibres
Supervisors: Prof.s Kim Venn & Colin Bradley (UVic) Sept. 2017 - April 2018
Constructed an optical test bench to perform tests of fibre focal ratio degradation.

NSERC USRA Scholar: Chemical Abundances of Accreted Halo Stars
Supervisor: Prof. Kim Venn (UVic) May 2017 - August 2017
Worked to re-derive stellar parameters, chemical abundances and orbits for a subset of alpha-poor stars from the study of Stephens & Boesgaard 2002.

NSF Science Intern: Absolute Ages of Globular Clusters from Adaptive Optics Data
Supervisors: Dr.s Rodrigo Carrasco & Bryan Miller (Gemini Observatory)
Sept - Dec. 2015, May - Aug. 2016
Reduced and analysed near-IR data from the GeMS multi-conjugate AO system to create colour magnitude diagrams.

CADC Intern: Searching for Kuiper Belt Objects in the OSSOS Survey
Supervisors: Dr.s JJ Kavelaars & Michele Bannister (NRC Herzberg)
January - April 2014
Analysed data collected for the Outer Solar System Origins Survey contributing to the direct discovery of roughly 50 new Kuiper Belt objects.

Related Employment

Communications Assistant (Astronomy Research Centre)
Supervisor: Prof. Kim Venn (UVic) Sept. 2016 - January 2017
Worked directly with the Director to create the first edition of the ARC newsletter. Authored, co-authored and edited six of the eight included articles, collaborating with ARC members from across instrumentation and science.

Astronomy Open House Facilitator (UVic Observatory)
Supervisor: Dr. Karun Thanjavur (UVic) Jan. 2016 - May 2016
Led tours and live observing sessions for the public with a small group of undergraduate students, using the UVic 0.8m telescope.

Astronomy Interpreter (Centre of the Universe)
Supervisor: Eric Chisholm (NRC Herzberg) May - September 2013
Presented interactive programs and live observing sessions with the 1.8m Plaskett telescope.Facilitated educational summer camps, counseling children from the ages of 6-10.

Teaching Experience

Part III/MASt Supervisor, IoA (Cambridge) October 2022-Present
Part III/MASt Course
Primary supervisor for a Masters student (co-supervised by Vasily Belokurov) undertaking a year long research project examining high resolution spectra.

Guest Lecturer, IoA (Cambridge) November 2022
Part III Course: Modern Stellar Dynamics
Delivered a Masters-level lecture on the chemical history of the Milky Way, focusing on coupling chemistry and dynamics. Filled in for Dr. Eugene Vasiliev

Teaching Assistant, RSAA (ANU) Spring 2019, 2020
ASTR2013: Foundations of Astrophysics
Assisted Prof. Mike Ireland in delivering 2h tutorials for the students. Facilitated a three day field trip to Siding Spring Observatory, including collecting observations and designing a globular cluster photometry project.

Teaching Assistant, Research School of Physics (ANU) Fall 2019, 2020
PHYS1013: Physics of Materials
Assisted A.Prof Adrian Lowe in running 2h tutorials covering mechanical, electrical, thermal and optical properties of crystalline materials in person and over Zoom.

Teaching Assistant, Research School of Physics (ANU) Fall 2020
Second Year Labs
Worked under Dr. Giovanni Guccione facilitating Peltier module and Compton scattering experiments during in-person lab sessions.

Industry Experience

FLIR Systems (Point Grey), Research Group Vancouver, BC, Canada
Optical Engineering Intern Summer 2018
Worked under the supervision of Dr. Stephen Se to develop automated measurement and corrective software for large format CCD cameras. Performed an optical re-design for a large format flat-fielding device.

Observing Proposals

GeMS/GSAOI/Gemini South (8m Telescope)
P.I. S. Monty, Co.I's D. Massari, K.C. Freeman, F. Rigaut et al., *"The Crash Signal: Timing the Last Major Merger of the Milky Way"*, 2022A, **Asked for 4.0h, awarded 4.0h**

GeMS/GSAOI/Gemini South (8m Telescope)
P.I. S. Monty, Co.I's D. Massari, K.C. Freeman, G. Fiorentino, et al., *"Exploring the Dynamical Histories of the "ΛCDM-Defying" Fornax Globular Clusters'* , 2020B, **Asked for 15.0h, awarded 15.0h**

ESPaDOnS/CFHT (3.6m Telescope)
P.I. K.A. Venn, Co.I's C. Kielty, W. Evans, V. Belokurov et al. including **S. Monty**, *"Chemistry of Stars in the Gaia/Sausage Merger Remnant."* 2020A **Awarded 15.0h.**

GRACES/Gemini North (8m Telescope)
P.I. R. Wyse Co.I's **S. Monty**, K.C. Freeman & O. Gerhard, *"Were globular clusters formed in dark-matter subhaloes?"*, 2019B, **Asked for 7.0h, awarded 7.0h**

Talks & Posters

• *Globular cluster dynamics across scales: from crowded cluster centres to the building blocks of the Milky Way*, September 2022, **invited talk** Melbourne University, Astrophysics Group

• *Peeking beneath the precision floor: striking similarities in the galactic siblings(?) NGC 288 and NGC 362*, June 2022, **contributed talk** at the annual Astronomical Society of Australia Science Meeting

• *Peering Beneath the Precision Floor: Unraveling the Histories of the Globular Clusters NGC 288 and NGC 362*, April 2022, **invited talk** University of Queensland, Astrophysics Group

• *Probing the Chemo-dynamic history of the Milky Way, coupling high resolution spectroscopy with Gaia*, October 2021, **contributed talk** at the COST-MW PhD School "Stellar spectroscopy and Astrophysical parameterisation from Gaia to Large Spectroscopic surveys"

• *Astrometry with MAVIS: Pushing Past the Limits of Gaia to the Crowded Centre of Globular Clusters*, July 2021, **contributed talk** at the annual Astronomical Society of Australia Science Meeting **Awarded Best Student Talk**

• *MAVISIM 1.2: Simulating Astrometry and Photometry with MAVIS*, July 2021, **contributed talk** at the Second MAVIS Science Meeting

• *Astrometry with MAVIS: Pushing Past the Limits of Gaia to the Crowded Centre of Globular Clusters*, June 2021, **contributed talk** at the AO4Astro2 Conference

• *Astrometry with MAVIS: Pushing Past the Limits of Gaia to the Crowded Centre of Globular Clusters*, May 2021, **contributed talk** at the ASTRO3D ECR Seminar Series

• *Disentangling the accretion history of the Milky Way using chemodynamics: coupling high resolution spectroscopy with Gaia DR2*, February 2020, **contributed talk** at the Second Aus-ESO Conference

• *The MAVIS Image Simulator*, November 2019, **contributed talk** at the MAVIS Science Workshop

• *Resolved Stellar Population Studies Towards the Next Generation ESO Instrument MAVIS*, May 2019, **poster presentation** at the IAUS 351: Star Clusters: from the Milky Way to the Early Universe Symposium

Professional Development

Attended the "The Milky Way in the Gaia Era" (Winter School), Saas-Fee, Switzerland, January 2019, instructors included Dr.s Jason Sanders, Justin Read and James Binney.

Attended the Introduction to Astronomical Instrumentation Summer School at the Dunlap Institute (University of Toronto), Canada, July 2017

Skills

Programming

- Proficient in: Python and MATLAB
- Basic experience with: Fortran, IDL, C, C# and Java
- Author of: MAVISIM adaptive optics image simulator, written in Python
- Proficient user of galpy Python galactic dynamics package, MOOG radiative transfer code and DAOPhot photometry software
- Familiar with GADGET-4 cosmological N-body and SPH code

Languages

- English (fluent), Spanish (intermediate)

Service and Outreach

IoA Postdoc Committee 2022-present

Member of the IoA postdoc committee. Communicating on behalf of the departmental postdocs at staff meetings, organising events and monitering postdoc wellbeing

IoA Equity Diversity and Inclusion Committee 2022-present

Member of the "Underrepresented Groups" working group and "Bullying and Harrassment" working group.

IoA Women's Day Committee 2022-present

Working with a group of postdocs, students and staff to organise the 2023 Women's Day celebration at the IoA.

RSAA Nominations Working Group 2022

Acted as student representative as part of the working group collecting, collating and vetting nominations for the RSAA Directorship position.

Member of LOC/SOC: Mount Stromlo Student Seminars 2021

Helped to organise the MSSS by recruiting invited speakers, facilitating a Careers discussion panel and hosting sessions.

RSAA Women in Astro Mentorship Program 2020 - 2021

Mentored a second year astronomy student, offering her program and research advice and providing emotional support.

Science Mentors ACT 2019 - 2021

Mentored four high school students thus far as they undertake year-long astronomical research projects using the MSATT telescope.

RSAA Executive Committee 2019 - 2020

Served as the student representative on the RSAA Exec Committee headed by the Stromlo Director Prof. Matthew Colless discussing school policies, budgets, teaching and cultural initiatives.

Anawim Companion Society 2013 - 2016

Assisted staff and residents of Anawim House in the preparation of meals expected to feed up to 35 people and managed laundry and shower facilities. Conversed with visitors, mainly members of the homeless community to provide a comfortable, supportive environment in which they felt welcome.

References

Emeritus Professor Ken Freeman (FRS)
(email: Kenneth.Freeman@anu.edu.au)
Duffield Professor Emeritus, Mt Stromlo Observatory,
Research School of Astronomy & Astrophysics, Mt. Stromlo Observatory, ACT, 2611, Australia

Prof. Wyn Evans
(email: nwe@ast.cam.ac.uk)
Professor, Institute of Astronomy,
Cambridge University, Madingley Rd, Cambridge CB3 0HA,

Prof. Vasily Belokurov
(email: vasily@ast.cam.ac.uk)
Professor, Institute of Astronomy,
Cambridge University, Madingley Rd, Cambridge CB3 0HA,

Dr. David Yong (email: David.Yong@anu.edu.au)
Astronomer, Mt. Stromlo Observatory
Research School of Astronomy & Astrophysics, Mt. Stromlo Observatory, ACT, 2611, Australia

Prof. Kim Venn (email: kvenn@uvic.ca)
Professor, Department of Physics & Astronomy
University of Victoria, Victoria, BC, V8W 2Y2, Canada