J. Ted Mackereth

Banting-CITA-Dunlap Fellow, *University of Toronto*

tedmackereth@cita.utoronto.ca
https://jmackereth.github.io

EDUCATION & TRAINING	**University of Toronto**, Toronto, Canada

NSERC Banting Fellow, Canadian Institute for Theoretical Astrophysics / Dunlap Institute for Astronomy & Astrophysics — 2020-Present
CITA Fellow, Canadian Institute for Theoretical Astrophysics — 2020-Present
Dunlap Fellow, Dunlap Institute for Astronomy & Astrophysics — 2020-Present

University of Birmingham, Birmingham, UK
Galactic Archaeology Research Fellow, School of Physics & Astronomy — 2019-2020
ASTEROCHRONOMETRY Project (European Research Council Consolidator Grant)

Liverpool John Moores University, Liverpool, UK
PhD, Astrophysics Research Institute — 2015 - 2019
Unveiling the History and Nature of the Milky Way using Galactic Surveys and Numerical Simulations

University of Liverpool / Liverpool John Moores University, Liverpool, UK
Master of Physics (MPhys), Astrophysics Research Institute, 1:1 — 2011-2015
The variation of NIR spectral lines by stellar parameters and chemical abundances

PAPERS
As first author

refereed: 22 — first author: 6 — citations: 1812 — h-index: 14 (2020-11-23)

6 **Mackereth, J. T.**; Bovy, J., *Weighing the stellar constituents of the galactic halo with APOGEE red giant stars*, 2020, MNRAS, 492, 3631 (arXiv:1910.03590) [cited: 19]

5 **Mackereth, J. T.**; Bovy, J.; Leung, H. W.; Schiavon, R. P. et al., *Dynamical heating across the Milky Way disc using APOGEE and Gaia*, 2019, MNRAS, 489, 176 (arXiv:1901.04502) [cited: 48]

4 **Mackereth, J. T.**; Schiavon, R. P.; Pfeffer, J.; Hayes, C. R. et al., *The origin of accreted stellar halo populations in the Milky Way using APOGEE, Gaia, and the EAGLE simulations*, 2019, MNRAS, 482, 3426 (arXiv:1808.00968) [cited: 90]

3 **Mackereth, J. T.**; Bovy, J., *Fast Estimation of Orbital Parameters in Milky Way-like Potentials*, 2018, PASP, 130, 114501 (arXiv:1802.02592) [cited: 17]

2 **Mackereth, J. T.**; Crain, R. A.; Schiavon, R. P.; Schaye, J. et al., *The origin of diverse α-element abundances in galaxy discs*, 2018, MNRAS, 477, 5072 (arXiv:1801.03593) [cited: 39]

1 **Mackereth, J. T.**; Bovy, J.; Schiavon, R. P.; Zasowski, G. et al., *The age-metallicity structure of the Milky Way disc using APOGEE*, 2017, MNRAS, 471, 3057 (arXiv:1706.00018) [cited: 77]

As Co-Author

16 Horta, D.; **Mackereth, J. T.**; Schiavon, R. P.; Hasselquist, S. et al., *The contribution of N-rich stars to the Galactic stellar halo using APOGEE red giants*, 2020, MNRAS(arXiv:2008.01097)

15 Horta, D.; Schiavon, R. P.; **Mackereth, J. T.**; Pfeffer, J. et al., *Evidence from APOGEE for the presence of a major building block of the halo buried in the inner Galaxy*, 2020, MNRAS, 500, 1385 (arXiv:2007.10374)

14 Trick, W. H.; Fragkoudi, F.; Hunt, J. A. S.; **Mackereth, J. T.** et al., *Identifying resonances of the Galactic bar in Gaia DR2:Clues from action space*, 2020, MNRAS(arXiv:1906.04786) [cited: 12]

13 Boardman, N. et al. (incl. **JTM**), *Are the Milky Way and Andromeda unusual? A comparison with Milky Way and Andromeda analogues*, 2020, MNRAS, 498, 4943 (arXiv:2009.02576)

12 Ahumada, R. et al. (incl. **JTM**), *The 16th Data Release of the Sloan Digital Sky Surveys: First Release from the APOGEE-2 Southern Survey and Full Release of eBOSS Spectra*, 2020, ApJS, 249, 3 (arXiv:1912.02905) [cited: 123]

11 Webb, J. J. et al. (incl. **JTM**), *Searching for solar siblings in APOGEE and Gaia DR2 with N-body simulations*, 2020, MNRAS, 494, 2268 (arXiv:1910.01646) [cited: 4]

10 Horta, D.; Schiavon, R. P.; **Mackereth, J. T.**; Beers, T. C. et al., *The chemical compositions of accreted and in situ galactic globular clusters according to SDSS/APOGEE*, 2020, MNRAS, 493, 3363 (arXiv:2001.03177) [cited: 15]

9 Chaplin, W. J. et al. (incl. **JTM**), *Age dating of an early Milky Way merger via asteroseismology of the naked-eye star ν Indi*, 2020, Nature Astronomy, 4, 382 (arXiv:2001.04653) [cited: 7]

8 Boecker, A. et al. (incl. **JTM**), *A galaxy's accretion history unveiled from its integrated spectrum*, 2020, MNRAS, 491, 823 (arXiv:1903.11089) [cited: 11]

7 Bovy, J.; Leung, H. W.; Hunt, J. A. S.; **Mackereth, J. T.** et al., *Life in the fast lane: a direct view of the dynamics, formation, and evolution of the Milky Way's bar*, 2019, MNRAS, 490, 4740 (arXiv:1905.11404) [cited: 52]

6 Hunt, J. A. S.; Bub, M. W.; Bovy, J.; **Mackereth, J. T.** et al., *Signatures of resonance and phase mixing in the Galactic disc*, 2019, MNRAS, 490, 1026 (arXiv:1904.10968) [cited: 19]

5 Vincenzo, F.; Miglio, A.; Kobayashi, C.; **Mackereth, J. T.** et al., *He abundances in disc galaxies. I. Predictions from cosmological chemodynamical simulations*, 2019, A&A, 630 (arXiv:1905.08309) [cited: 4]

4 Aguado, D. S. et al. (incl. **JTM**), *The Fifteenth Data Release of the Sloan Digital Sky Surveys: First Release of MaNGA-derived Quantities, Data Visualization Tools, and Stellar Library*, 2019, ApJS, 240, 23 (arXiv:1812.02759) [cited: 152]

3 Abolfathi, B. et al. (incl. **JTM**), *The Fourteenth Data Release of the Sloan Digital Sky Survey: First Spectroscopic Data from the Extended Baryon Oscillation Spectroscopic Survey and from the Second Phase of the Apache Point Observatory Galactic Evolution Experiment*, 2018, ApJS, 235, 42 (arXiv:1707.09322) [cited: 612]

2 Albareti, F. D. et al. (incl. **JTM**), *The 13th Data Release of the Sloan Digital Sky Survey: First Spectroscopic Data from the SDSS-IV Survey Mapping Nearby Galaxies at Apache Point Observatory*, 2017, ApJS, 233, 25 (arXiv:1608.02013) [cited: 391]

1 Schiavon, R. P. et al. (incl. **JTM**), *Chemical tagging with APOGEE: discovery of a large population of N-rich stars in the inner Galaxy*, 2017, MNRAS, 465, 501 (arXiv:1606.05651) [cited: 103]

Submitted & In Press

3 Montalbán, J.; **Mackereth, J. T.**; Miglio, A.; Vincenzo, F. et al., *Chronologically dating the early assembly of the Milky Way*, 2020 (arXiv:2006.01783) [cited: 4]

2 Miglio, A.; Chiappini, C.; **Mackereth, J. T.**; Davies, G. et al., *Age dissection of the Milky Way discs: red giants in the Kepler field*, 2020 (arXiv:2004.14806) [cited: 12]

1 Miglio, A. et al. (incl. **JTM**), *HAYDN – High-precision AsteroseismologY of DeNse stellar fields (ESA Voyage 2050 White Paper)*, 2019 (arXiv:1908.05129)

Conference Proceedings

3 Schiavon, R. P.; **Mackereth, J. T.**; Pfeffer, J.; Crain, R. A. et al., *The building blocks of the Milky Way halo using APOGEE and Gaia or Is the Galaxy a typical galaxy?*, 2020, Star Clusters: From the Milky Way to the Early Universe, 351, 170 (arXiv:2002.08380)

2 Horta, D.; **Mackereth, J. T.**; Schiavon, R. P.; SDSS-Iv/Apogee Collaboration, *The contribution of Globular Clusters to the stellar halo using APOGEE and GAIA*, 2020, Star Clusters: From the Milky Way to the Early Universe, 351, 455

1 **Mackereth, J. T.**; Bovy, J.; Schiavon, R. P.; SDSS-IV/APOGEE Collaboration, *The age-metallicity structure of the Milky Way disc with APOGEE*, 2018, Rediscovering Our Galaxy, 334, 265 (arXiv:1708.05399)

SELECTED TALKS

- *Linking insights into the disc, bulge and halo for a holistic approach to constraining the assembly of the Milky Way*, Contributed Talk, *The Gaia Treasure Hunt*, MW-GAIA COST action workshop, Cambridge, UK

- *Linking insights into the disc, bulge and halo for a holistic approach to constraining the assembly of the Milky Way*, CITA Seminar, Toronto, ON, Canada
- *Constraints on the assembly of the Milky Way from APOGEE,* Gaia *and the EAGLE simulations*, Invited Talk, KITP Conference: *'In the balance: stasis and disequilibrium in the Milky Way'*, Santa Barbara, CA, USA
- *Constraining the formation of the Milky Way disk with APOGEE, Gaia and the EAGLE simulations*, Invited Plenary Talk, SDSS-IV Collaboration Meeting 2018, Seoul, South Korea
- *The origin of diverse α-element enrichment in galaxy discs*, Invited Lunch Seminar, ICC, Durham University
- *Constraints on the origin of the high-$[\alpha/\text{Fe}]$ disc with APOGEE-Gaia,* Contributed Talk, *Gaia: The billion-star galaxy census: at the threshold of Gaia data release 2*, EWASS 2018, Liverpool, UK
- *Contextualising $[\alpha/\text{Fe}]$ bimodality in the EAGLE simulations*, Contributed Talk *Hello, goodbye: understanding the duality of the Milky Way*, EWASS 2018, Liverpool, UK
- *Galactic Archaeology with mono-age stellar populations*, Invited Seminar, March 2018, University of Birmingham
- *The Milky Way in a cosmological context: The origin of diverse α-element enrichment in galaxy discs*, Contributed Talk, Virgo Collaboration Meeting 2017, Garching, Germany
- *The origin of α-element bimodality in the Milky Way and galaxy discs*, Informal Talk, Flatiron CCA Stars Group Meeting, New York City, USA
- *Reconstructing the history of the Milky Way disc*, Poster Prize Talk, IAUS334: *Rediscovering our Galaxy*, Potsdam, Germany
- *Reconstructing the history of the Milky Way disc*, Contributed Talk, *Bridging the near and the far: from the Milky Way to nearby galaxies*, EWASS 2017, Prague, Czech Republic
- *Constraining models for Galactic disk formation with APOGEE and EAGLE*, Contributed Talk, SDSS-IV Collaboration Meeting 2016, Madison, WI

WORKSHOPS
- *Weighing Stars from Birth to Death: How to Determine Stellar Masses?*, 2018 Lorentz Center Workshop (Invited), Leiden, The Netherlands
- *2018* Gaia *Sprint*, CCA, Flatiron Institute, New York City, USA
- *2017* Gaia *Sprint*, *MPIA*, Heidelberg, Germany

GRANTS, AWARDS & HONOURS
- NSERC Banting Fellowship, 2020, 140 000 CAD
- LJMU Faculty of Engineering Thesis prize, 2019, 100 GBP
- SDSS Early Career Travel Fund Grant, 2018, 600 USD
- Dunlap Institute Visiting Member, University of Toronto, Canada, 2017, 1800 CAD
- RAS Personal Grant, *The kinematics and dynamics of mono-abundance populations in the Milky Way using Gaia and APOGEE*, 2017, 1000 GBP
- IAUS334 Travel Grant, 2017, 300 EUR
- Poster Prize, IAUS334, Potsdam, Germany, 2017

OTHER AFFILIATIONS
- SDSS 'Milky Way as a Galaxy' Working Group Co-Chair
- SDSSIV/APOGEE-2 Team member
- APO-K2 Core science team member
- WEAVE survey Galactic Archaeology science working group member
- Maunkea Spectroscopic Explorer science working group member
- Virgo Consortium member
- **Reviewer:** MNRAS, ApJ, A&A, CanTAC

SOFTWARE
- *galpy* galactic dynamics package contributor

- *apogee* python package contributor
- **Languages:** Python, R, Stan, Tensorflow, SQL/ADQL, LaTeX, HTML/CSS.

STUDENT MENTORING	James M. Lane, *PhD Student*, UofT, 2019-Present Danny Horta-Darrington, *PhD Student*, LJMU, 2018-Present Emma Willett, *PhD Student*, UoB, 2019-Present Rayhan Mahmud, *Undergraduate Summer Student*, UoB, 2019
TEACHING	**University of Birmingham** - Demonstrator, *Introduction to Computing* - Instructor, *Computational Physics* - Instructor, *Postgraduate Research Skills* **Liverpool John Moores University** - Senior Demonstrator, *Practical Astrophysics* - Tutor, *Computational Galactic Dynamics, Distance Learning MSc* - Teaching Assistant, *Introduction to Astrophysics* - Mentoring of *MPhys* project students - PhD student talks organiser, 2017
OUTREACH ACTIVITIES	- Featured on Japanese national broadcaster NHK's *Cosmic Front NEXT* documentary, *Miracle Milky Way* - Consulted by the BBC for scientific input on upcoming documentary series, *The Universe* - Tim Peake Cosmic Classroom Event, February 2016 *World Museum, Liverpool* - The Size of the Universe (talk/workshop), April 2016 *Werneth Primary School, Oldham, UK* - Travelling to Space (talk/workshop), March 2018 *Abraham Moss Community School, Manchester, UK* - Undergraduate open days student representative, 2016-2018 *Liverpool John Moores University / University of Liverpool*