

Dr. Jason A. S. Hunt

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RESEARCH INTERESTS

Milky Way structure & dynamics: Disc structure, kinematics and chemistry; the bar and spiral arms.

Galaxy modelling: Both test particle and N-body galaxy modelling; Made-to-Measure methods.

Galactic surveys: E.g. Gaia, APOGEE, LSST; Mock catalogue construction; Analysis of big data.

EDUCATION

2015 **Ph.D.**, Astrophysics, University College London, UK.

“N-body dynamical modelling of the Milky Way Disc for the Gaia era.”

Advisor: Prof. Daisuke Kawata.

2011 **MMath, 1st class**; Mathematics with Astronomy Masters degree, University of Leicester, UK.

PROFESSIONAL APPOINTMENTS

9/2019 – present Flatiron Research Fellow, Centre for Computational Astrophysics, Flatiron institute.

9/2016 – 9/2019 Dunlap Fellow, Dunlap Institute for Astronomy & Astrophysics, University of Toronto.

2/2016 – 9/2016 Member of the European Space Agency’s Gaia Data Processing & Analysis Consortium, Mullard Space Science Laboratory, University College London.

PRIZES AND AWARDS

2018 John Charles Polanyi prize in Physics, Council of Ontario Universities (\$20,000).

2017 Poster prize at IAU Symposium 330, Nice, France.

2016 – 19 Dunlap funding for undergraduate research students (\$18,000).

2016 – 19 Dunlap Research Award (\$54,000).

2015 Alan Johnstone award for outstanding scientific achievement by a student, MSSL, UK.

2015 Bronze prize at the ‘SET for Britain’ national research poster competition (£1,000), UK.

2014 1st prize in the Built Environment, Engineering sciences and Mathematical & Physical sciences category in the UCL Graduate School research poster competition, UK.

2011 Modelling & Computation prize in ‘Science & Engineering’, University of Leicester, UK.

TEACHING

2017-21 Mentored 5 undergraduate student projects: resulting in 1 first author and 3 coauthor papers.

2021 Mentor at the ‘[Applied Galactic dynamics](#)’ summer school, New York, USA, July - August 2021

2020 Guest lecturer for Prof. Ness’ ‘Galactic Archaeology’ course, Columbia University, USA.

2019 Invited lecturer at the ‘[International School of Space Science](#)’, Aquila, Italy, 3-7 June 2019.

2017 Lead instructor in the ‘Wavefront sensing lab’, Dunlap summer school, Dunlap Institute.

SELECTED PRESENTATIONS

- 2021 Invited seminar at Department of Physics and Astronomy, Johns Hopkins University, Baltimore.
- 2021 Invited colloquia at Department of Astronomy, University of Texas at Austin, USA.
- 2021 Talk at ‘The local group: Assembly & evolution, STScI symposium, online.
- 2020 Talk at ‘Galactic Disc and Halo Dynamics towards Gaia eDR3’, London, UK.
- 2019 Invited talk at ‘In the Balance: Stasis and Disequilibrium in the Milky Way’, Santa Barbara, USA.
- 2018 Talk at ‘The life & times of the Milky Way’, Shanghai, China.
- 2018 Invited colloquia at the Department of Physics & Astronomy, University of Rochester, USA.
- 2018 Talk at ‘The European Week of Astronomy & Space Science’, Liverpool, UK.
- 2017 Invited seminar at the Department of Physics, Queens University, Canada.
- 2017 Talk at ‘The European Week of Astronomy & Space Science’, Prague, Czech Republic.
- 2017 Poster at ‘IAU Symposia 330: Astrometry & Astrophysics in the Gaia sky’, Nice, France.
- 2017 Invited seminar at Department of Physics & Astronomy, University of Waterloo, Canada.
- 2017 Invited seminar at Institute of Astrophysics, University of Cambridge, UK.
- 2016 Talk at ‘Gaia Challenge IV’, Stockholm, Sweden.
- 2015 Talk at ‘Gaia Challenge III’, Barcelona, Spain.
- 2014 Talk at ‘The Milky Way unravelled by Gaia’, Barcelona, Spain.
- 2014 Talk at ‘Gaia Challenge II’, Heidelberg, Germany.
- 2014 Poster at ‘The European Week of Astronomy & Space Science’, Geneva, Switzerland.
- 2014 Talk at ‘National Astronomy Meeting’, Portsmouth, UK.
- 2013 Talk at ‘The Galaxy, Stellar Compositions & Dynamics’, Tenerife, Spain.
- 2013 Talk at ‘Gaia Challenge I’, Surrey, UK.

SERVICE

- Referee for MNRAS, A&A, ApJ & Nature Astronomy.
- 2021 Member of the ‘CCA computational resources committee’.
- 2020/21 Member of the ‘Applied Galactic dynamics summer school’ organization committee, Centre for Computational Astrophysics.
- 2020 Member of the Flatiron Research Fellow applications committee.
- 2018 Chair of the ‘Summer Undergraduate Research Project’ organization committee, Dunlap Institute - duties included administration of the application procedure, organisation of ‘Astronomy 101’ lectures & skills workshops for the students, organisation of midterm & final presentations.
- 2017/19 Member of the ‘Summer Undergraduate Research Project’ organization committee, Dunlap Institute.
- 2015 Astrophysics departmental seminar organizer, MSSSL.

1ST AUTHOR & SUPERVISED STUDENT PUBLICATIONS (BLUE HYPERLINKS TO ADS)

- 14. [Snails Across Scales: Local and Global Phase-Mixing Structures as Probes of the Past and Future Milky Way](#), Gandhi S. S., Johnston K. V., **Hunt J. A. S.**, Price-Whelan A. M., Laporte C. F. P., Hogg D. W., 2021, ApJ, submitted.
- 13. [Resolving local and global kinematic signatures of satellite mergers with billion particle simulations](#), **Hunt J. A. S.**, Stelea I. A., Johnston K. V., Gandhi S. S., Laporte C. F. P., Bedorf J., 2021, MNRAS, 508, 1459.

12. [The power of coordinate transformations in dynamical interpretations of Galactic structure](#), **Hunt J. A. S.**, Johnston K. V., Pettitt A. R., Cunningham E. C., Kawata D., Hogg D. W., 2020, 497, 818.
11. [Signatures of resonance and phase mixing in the Galactic disc](#), **Hunt J. A. S.**, Bub M., Bovy J., Mackereth J. T., Trick W. H., Kawata D., 2019, MNRAS, 490, 1026.
10. [Rediscovering the tidal tails of NGC288 with Gaia DR2](#), Kaderali S., **Hunt J. A. S.**, Webb J., Price-Jones N., Carlberg R., 2019, MNRASL, 484, 115.
9. [Transient spiral structure and the disc velocity substructure in Gaia DR2](#), **Hunt J. A. S.**, Hong J., Bovy J., Kawata D., Grand R. J. J., 2018, MNRAS, 481, 3794.
8. [The 4:1 Outer Lindblad Resonance of a long slow bar as an explanation for the Hercules stream](#), **Hunt J. A. S.**, Bovy J., 2018, MNRAS, 477, 3945.
7. [The Hercules stream as seen by APOGEE-2 South](#), **Hunt J. A. S.**, Bovy J., Pérez-Villegas A., Holtzman J., Sobeck J., Chojnowski D., Santana F., Palicio P. A., Wegg C., Gerhard O., Almeida A., Bizyaev D., Fernandez-Trincado J. G., Lane R. R., Longa-Peña P., Majewski S. R., Pan K., Roman-Lopes A., 2018, MNRAS, 476, 95.
6. [Stars with fast Galactic rotation observed in Gaia TGAS: a signature driven by the Perseus arm](#), **Hunt J. A. S.**, Kawata D., Monari G., Grand R. J. J., Famaey B., Siebert A., 2017, MNRASL, 467, 21.
5. [Detection of a dearth of stars with zero angular momentum in the Solar neighbourhood](#), **Hunt J. A. S.**, Bovy J., Carlberg R., 2016, ApJL, 832, 25.
4. [The stellar kinematics of corotating spiral arms in Gaia mock observations](#), **Hunt J. A. S.**, Kawata D., Grand R. J. J., Minchev I., Pasetto S., Cropper M., MNRAS, 2015, 450, 2132.
3. [M2M modelling of the Galactic disc via PRIMAL: fitting to Gaia error added data](#), **Hunt J. A. S.**, Kawata D., 2014, MNRAS, 443, 2112.
2. [Investigating bar structure of disc galaxies via PRIMAL: a particle-by-particle M2M algorithm](#), **Hunt J. A. S.**, Kawata D., Martel H., 2013, MNRAS, 432, 3062.
1. [Disc galaxy modelling with a particle-by-particle made-to-measure method](#), **Hunt J. A. S.**, Kawata D., 2013, MNRAS, 430, 1928.

CO-AUTHORED PUBLICATIONS

23. [Exploring the Sgr-Milky-Way-disc interaction using high resolution N-body simulations](#), Bennett M., Bovy J., **Hunt J. A. S.**, 2021, MNRAS, submitted.
22. [Galactic Bar Resonances Inferred from Kinematically Hot Stars in Gaia EDR3](#), Kawata D., Baba J., **Hunt J. A. S.**, Schönrich R., Ciucă, I., Friske J., Seabroke G., Cropper M., 2021, MNRAS, 508, 728.
21. [Identifying resonances of the Galactic bar in Gaia DR2: Clues from action space](#), Trick W. H., Fragkoudi F., **Hunt J. A. S.**, Mackereth J. T., White S. D. M., 2021, MNRAS, 500, 264
20. [The Strength of the Dynamical Spiral Perturbation in the Galactic Disk](#), Eilers A. C., Hogg D. W., Rix H-W., **Hunt J. A. S.**, Fouvy J-B., Buck T., 2020, ApJ, 900,186.
19. [The 16th Data Release of the Sloan Digital Sky Surveys: First Release from the APOGEE-2 Southern Survey and Full Release of eBOSS Spectra](#), Ahumada R. et al. [including **Hunt J. A.S.**], 2020, ApJS, 249, 3A.
18. [Searching for Solar Siblings in APOGEE and Gaia DR2 with N-body Simulations](#), Webb J. J., Price-Jones N., Bovy J., Portegies Zwart S., **Hunt J. A. S.**, Mackereth J. T., Leung H. W., 2019 submitted.

17. [Life in the fast lane: a direct view of the dynamics, formation, and evolution of the Milky Way's bar](#), Bovy J., Leung H. W., **Hunt J. A. S.**, Mackereth J. T., Garcia-Hernandez D. A., Roman-Lopes A., 2019, MNRAS, 490, 4740.
16. [The Fifteenth Data Release of the Sloan Digital Sky Surveys: First Release of MaNGA Derived Quantities, Data Visualization Tools and Stellar Library](#), Aguado D. S. et al. [including **Hunt J. A. S.**], 2018, ApJSS, 240, 23.
15. [Aurigaia: mock Gaia DR2 stellar catalogues from the Auriga cosmological simulations](#), Grand R. J. J. et al. [including **Hunt J. A. S.**], 2018, MNRAS, 481, 1726.
14. [Radial distribution of stellar motions in Gaia DR2](#), Kawata D., Baba J., Ciucă I., Cropper M., Grand R. J. J., **Hunt J. A. S.**, Seabroke G., 2018, MNRAS, 479, 108.
13. [The fourteenth data release of the Sloan Digital Sky Survey: First spectroscopic data from the extended Baryon Oscillation Sky Survey and from the second phase of the Apache Point Observatory Galactic Evolution Experiment](#), Abolfathi et al. [including **Hunt J. A. S.**], 2018, ApJ, 235, 42.
12. [Gaia DR1 evidence of Disrupting the Perseus arm](#), Baba J., Kawata D., Matsunaga N., Grand R. J. J., **Hunt J. A. S.**, 2018, ApJ, 853, 23.
11. [Made-to-Measure modelling of observed galaxy dynamics](#), Bovy J., Kawata D., **Hunt J. A. S.**, 2018, MNRAS, 473, 2288.
10. [Metallicity gradient of the thick disc progenitor at high redshift](#), Kawata D., Allende Prieto C., Brook C. B., Casagrande L., Ciucă I., Gibson B. K., Grand R. J. J., Hayden M. R., **Hunt J. A. S.**, 2018, MNRAS, 473, 867.
9. [Gaia Data Release 1. Testing Parallaxes with local Cepheids and RR Lyrae stars](#), Gaia collaboration et al. [including **Hunt J. A. S.**], 2017, A&A, 605, 79.
8. [Gaia Data Release 1. Open cluster astrometry: performance, limitations and future prospects](#), Gaia collaboration et al. [including **Hunt J. A. S.**], 2017, A&A, 601, 19.
7. [Tracing the Hercules stream with Gaia and LAMOST: new evidence for a fast bar in the Milky Way](#), Monari G., Kawata D., **Hunt J. A. S.**, Famaey B., 2017, MNRASL, 466, 113.
6. [Impacts of a flaring star-forming disc and stellar radial mixing on the vertical metallicity gradient](#), Kawata D., Grand R. J. J., Gibson B. K., Casagrande L., **Hunt J. A. S.**, Brook C. B., 2017, MNRAS, 464, 702.
5. [Gaia Data Release 1. Summary of the astrometric, photometric, and survey properties](#), Gaia collaboration et al. [including **Hunt J. A. S.**], 2017, A&A, 595, 2.
4. [The Gaia mission](#), Gaia collaboration et al. [including **Hunt J. A. S.**], 2017, A&A, 595, 1.
3. [Spiral arm kinematics for Milky Way stellar populations](#), Pasetto S., Natale G., Kawata D., Chiosi C., **Hunt J. A. S.**, Brogliato C., 2016, MNRAS, 461, 2383.
2. [Spiral- and bar- driven peculiar velocities in Milky Way-sized galaxy simulations](#), Grand R. J. J., Bovy J., Kawata D., **Hunt J. A. S.**, Famaey B., Siebert A., Monari G., Cropper M., 2015, MNRAS, 453, 1867.
1. [Gas and stellar motions and observational signatures of corotating spiral arms](#), Kawata D., **Hunt J. A. S.**, Grand R. J. J., Pasetto S., Cropper M., 2014, MNRAS, 443, 2757.

REFERENCES

- Prof. Kathryn Johnston, kvj@astro.columbia.edu, +1 212 854 3278
- Prof. Daisuke Kawata, d.kawata@ucl.ac.uk, +44 148 320 4904
- Prof. Jo Bovy, bovy@astro.utoronto.ca, +1 416 946 5465