Michele T. Bannister

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ACADEMIC QUALIFICATIONS

2014-Dec **PhD, The Australian National University.** *Bright trans-Neptunian objects in the southern sky*
with P. J. Francis, B. P. Schmidt, M. E. Brown (Caltech). Joan Duffield Research Scholar; AP Award
2009 Graduate Course in Science Communication, National Centre for Public Awareness of Science (ANU)
2007 **B. Sc. (1^{st} class Honours)** in Astronomy & Geology. **University of Canterbury, New Zealand**
Polygonal patterned ground & ancient buried ice on Mars and in Antarctica with P. L. Cottrell, D. C. Nobes.
Aurora Scholar; Carlisle Trust Scholarship; Prof. C.C. Farr Memorial Scholarship; Yarrow Trust Scholarship

PROFESSIONAL EXPERIENCE

2020-Feb – **Lecturer in Astronomy, University of Canterbury, New Zealand**
2016-Aug – **Research Fellow and Director's Outreach Fellow, Queen's University Belfast**
– 2019-Dec *Asteroids in the main belt as seen by the Pan-STARRS survey*, with A. Fitzsimmons
2018 – 2020 Co-investigator, Solar System Origins Legacy Survey, 206 orbits (largest in Cycle 26), Hubble Space Telescope
2018 – 19 ISSI International Team studying the results and implications of interstellar object 1I/'Oumuamua
2018 – Team member, Comet Interceptor Mission, ESA selected for 2028 launch in F-class call
2019 – Lead, LSST Outer Solar System Working Group for the Solar System Science Collaboration
2019 Co-investigator, NASA planetary mission concept studies proposal: joint exploration of the ice giants & Kuiper belt
2017 – 19 Team member, Maunakea Spectroscopic Explorer
2014 – 19 Co-investigator and observer, Colours of OSSOS, 386-hr Gemini North Large Program
2014 – 19 Principal investigator, Ultraviolet Col-OSSOS, 120-hr CFHT simultaneous u-band photometric survey
2013-Apr – **Research Fellow, University of Victoria and the National Research Council of Canada**
– 2016-Jul *Data acquisition lead, 560-hr Outer Solar System Origins Survey (OSSOS), #1 CFHT Large Program*
with J.J. Kavelaars (NRC), B. J. Gladman (UBC), J.-M. Petit (UTINAM)

- open-source software development for analysis of 4m telescope wide-field optical imagery;
- management of observation programming on fast turnaround for a major astronomical facility, CFHT;
- project management and coordination for a 50-person worldwide collaboration.

PROFESSIONAL RECOGNITION AND HONOURS

2017 Asteroid (10463) Bannister named by the International Astronomical Union
2017 OSSOS operations & science outcomes commended by the CFHT Scientific Advisory Council
2011 ANU Vice-Chancellor's Community Service Award, for RSAA students' outreach program for ages 7-18

SUPERVISING AND TEACHING

2018 Invited lectures, graduate-level Workshop in Geology and Geophysics of the Solar System, Petnica, Serbia
Invited lecture, graduate-level UKRI STFC introductory course for new UK astronomy PhD students
Oversight on 2^{nd} year undergraduate physics lab experiment, QUB
2017 Supervisor, 4^{th} year astro undergraduate (Masters) project (C. Gibson), QUB
2017-18 Guest lectures, astronomy, 1^{st} and 2^{nd} year undergraduate courses, QUB
2016 Co-supervisor, 4^{th} year astro undergraduate project (N. Hammar), UVic
2015 Supervisor, 4^{th} year astro undergraduate on co-op (K. Webb), NRC/UVic
2014 Co-supervisor, 2^{nd} year undergraduate on co-op (S. Monty), NRC/UVic
2013 Co-supervisor, senior computer science undergraduate on co-op (D. Rusk), NRC/UVic
2012 Co-supervisor, 3^{rd} year undergraduate research project (E. Hampton), ANU
2011 Graduate Teaching Program, completed with merit, ANU
Tutorials for introductory physics, 1^{st} year undergraduates, ANU
2010 Co-supervisor, 3^{rd} year undergraduate research project (L. Duong), ANU

SELECTED GRANT AWARDS AND ASSOCIATION

2019 Lorentz Center workshop, "Tackling the complexities of substellar objects: brown dwarfs to planets", €31,250
2018 LSST:UK funding for conference travel, £3,265
2017– Named postdoc, UK STFC QUB Consolidated Grant 2017–2020 (PI: F. P. Keenan), £1,307,461

INVITED CONFERENCE TALKS AND RECENT INSTITUTE SEMINARS

2020 "Triton and the Kuiper Belt connection" — *Scientific Exploration of the Ice Giants*, Royal Society, London.
2019 Center for Space and Habitability (CSH) at the University of Bern, Switzerland
University of Leicester, UK
University of Oxford, UK
Leiden Observatory, Netherlands (recording)
Royal Observatory, Edinburgh, UK
University College London, UK
"A darkness full of worlds: prospects for TNO surveys" — *The Transneptunian Solar System*, Coimbra, Portugal.
2017 "Fantastic icy worlds & where to find them" — *AAS Dynamical Astronomy/Royal Astronomical Society*, London.
IMCCE, L'Observatoire de Paris, France
2016 "Pluto: once a point of light, now a world" — *Royal Astronomical Society of New Zealand*, Napier, NZ.
2015 "It takes two: simultaneous exploration of the outer Solar System with CFHT & Gemini" —
The Science & Future of Gemini, Toronto, Canada.
2014 "Mapping the deep: the past & future promise of TNO surveys" — *Asteroids, Comets, Meteors*, Helsinki, Finland.
2013 "Small worlds, big puzzles: insights from the Solar System's outer frontiers" —
Astronomical Society of Australia Annual Meeting; Melbourne, Australia.

PUBLIC ENGAGEMENT

2017 – Director's Outreach Fellow of the Astrophysics Research Centre, Queen's University Belfast
• organiser, undergrad summer research internships program
• regularly interviewed for comment (>50 requests/year), e.g. *Scientific American, Newsweek, BBC Radio 4, The Guardian, National Geographic* on surprising discoveries & about a new TNO, *Slate.com, New Scientist, Radio New Zealand* on the Moon & on Pluto, *Wired.co.uk, The Verge, Smithsonian.com, de Volkskrant*
2017-19 Feature interviewee, BBC *Sky at Night*: 2017-07 (TNOs), 2018-02 ('Oumuamua), 2019-01 (*New Horizons* flyby)
2019 Invited speaker, New Scientist Live, London (40,000 attendees)
2019 Invited speaker, British Astronomical Association annual meeting
2018 Invited speaker, European Astrofest 2018, London
Profiled in "STEM Courses and Careers" supplement, *Irish News* for the Northern Ireland Science Festival
2016 Video of invited seminar at SETI Institute, San Francisco viewed by 28,000 people (recording)
2016 "Making data pretty — and understandable." *Python in Astronomy*; Seattle, USA. (recording)
Presenter, public science engagement curated Twitter accounts: @astrotweeps (2016, 2018)
2015–16 Regular astronomy discussions on Canadian radio station *CFAX 1070* e.g. Juno at Jupiter (recording)
2015 Invited expert commentary, *Nature.com* live coverage of Pluto spacecraft flyby
2014, 2015 Invited lectures, *Royal Astronomical Society of Canada: Victoria Centre, Nanaimo Centre*
2014, 2015 Public lectures, the Centre of the Universe astronomy outreach centre, Victoria BC

PROFESSIONAL SERVICE

External expert reviewer
• Time allocation committees for: Hubble Space Telescope; Siding Spring; CFHT; UK STFC
• Funding proposal panels for: — NASA Solar System Observation;
— Natural Sciences & Engineering Research Council of Canada 5-year proposals
• Referee, *Science, The Astronomical Journal, The Astrophysical Journal Letters*,
Monthly Notices of the RAS, Research Notes of the AAS
Invited to review panel, NASA $500M Discovery-class mission (declined due to prior commitments)
2017 – 2020 Elected representative, Committee of the AAS Division for Planetary Sciences
• serving >1300 planetary scientists based around the world
2017 – International Astronomical Union's Working Group for Planetary System Nomenclature
Large Synoptic Survey Telescope (LSST)
• Committee, overhaul of technical website for astronomers, 2018
"The case for the North Ecliptic Spur survey" (recording). LSST@Europe 3, 2018.
• Travel funding award panel, Solar System collaboration workshop July 2018
2018 Session chair, "Centaurs/TNOs I: Observational Surveys", *DPS*, Knoxville
Session convenor, "1I/'Oumuamua - the first interstellar object", *EPSC*, Berlin
2017 Session chair, "Post Main Sequence Planetary System Science", *DDA/RAS*, London
2013 – 2016 Co-organiser, visiting speaker colloquium program, NRC Herzberg
2015 Session chair, "Centaurs, Trans-Neptunian Objects, & the Inner Oort Cloud". *AAS Div. Planetary Sci.*
2014 Hubble Space Telescope Solar System Advisory Committee
2012 Invited co-convenor, session chair, "The Formation of Solar Systems", *Meteoritical Soc.*, Cairns

REFEREED JOURNAL PUBLICATIONS AND PROCEEDINGS

46 peer-reviewed publications: 9 as first author, 4 as second author, submitted or accepted.
Hirsch index (h-index) of 16: 16 publications each with ≥ 16 citations; my five most-cited are indicated with (*).
Cumulative citations: >590 citations (NASA ADS).

SNIPs of journals, where present as of 2017: *Space Science Reviews* = 2.52, *The Astrophysical Journal Supplement Series* = 2.29, *Journal of Astronomical Telescopes, Instruments, and Systems* = 2.08, *Publications of the Astronomical Society of the Pacific* = 1.23, *The Astrophysical Journal Letters* = 1.22, *Icarus* = 1.14, *The Astronomical Journal* = 1.10, *Astronomy & Astrophysics* = 1.10, *Monthly Notices of the Royal Astronomical Society* = 0.90.

- **Expanding horizons: the need for direct exploration of the diverse trans-Neptunian Solar System**.
  M. T. Bannister, *B. Holler, and 18 colleagues.* (48 pp).
  In review, Space Science Reviews.
- **OSSOS: XIX. Testing early Solar System dynamical models using OSSOS Centaur detections.**
  D. Nesvorný, D. Vokrouhlický, B. Davidsson, and 8 colleagues including **M. T. Bannister**. (14 pp).
  Accepted to The Astronomical Journal. arXiv:1907.10723
- **OSSOS: XVIII. Constraining migration models with the 2:1 resonance using the Outer Solar System Origins Survey**.
  Y. T. Chen, B. J. Gladman, K. Volk and 10 colleagues including **M. T. Bannister**. (18 pp).
  In review, The Astronomical Journal.
- **OSSOS: XVII. An upper limit on the number of distant planetary objects in the Solar System.**
  E. Ashton, B. J. Gladman, J.J. Kavelaars and 8 colleagues including **M. T. Bannister**. (13 pp).
  In review, Icarus.
- **(OSSOS: XVI) A dearth of small members in the Haumea family revealed by the OSSOS Survey**.
  R. E. Pike, B.C.N. Proudfoot, D. Ragozzine and 8 colleagues including **M. T. Bannister**. (11 pp).
  Accepted to Nature Astronomy.
- **OSSOS: XV. Probing the distant Solar System with observed scattering trans-Neptunian objects**.
  N. Kaib, R. E. Pike, S. M. Lawler and 10 colleagues including **M. T. Bannister**. (45 pp).
  Accepted to The Astronomical Journal. arXiv:1905.09286
- **OSSOS: XIV. The plane of the Kuiper belt**.
  C. Van Laerhoeven, B. J. Gladman, K. Volk, J.J. Kavelaars, J.-M. Petit, **M. T. Bannister**, *M. Alexandersen, Y. T. Chen, S. D. J. Gwyn.* The Astronomical Journal, 158:1 (49), 2019. IOP
- **A darkness full of worlds: prospects for TNO discovery surveys.**
  M. T. Bannister. (20 pp).
  Invited chapter for book *The Trans-Neptunian Solar System* (ed. D. Prialnik, L. Young, A. Barucci).
- **Perspectives on the distribution of orbits of distant trans-Neptunian objects**.
  J. J. Kavelaars, S. M. Lawler, **M. T. Bannister**, *C. Shankman.* (13 pp).
  Invited chapter for book *The Trans-Neptunian Solar System* (ed. D. Prialnik, L. Young, A. Barucci).
- **Conductive layer detection in a periglacial Antarctic environment with time-domain electromagnetics**.
  M.T. Bannister, *D. C. Nobes, P. L. Cottrell, M. J. Godfrey, R. S. Sletten.* (5 pp).
  Accepted to the Proceedings of the Society of Exploration Geophysicists Annual Meeting, 15-20 Sep 2019.
- **Imaging buried massive ice in Victoria Valley, Antarctica, with multi-electrode electrical resistivity and ground-penetrating radar.**
  M. T. Bannister, *D. C. Nobes, M. J. Godfrey, R. S. Sletten.* (5 pp).
  Accepted to the Proceedings of the Society of Exploration Geophysicists Annual Meeting, 15-20 Sep 2019.
- **Time-lapse electrical resistivity and ground penetrating radar imaging of young polygonal patterned ground in Victoria Valley, McMurdo Dry Valleys, Antarctica.**
  M. J. Godfrey, D. C. Nobes, **M. T. Bannister**, *R. S. Sletten.* (5 pp).
  Accepted to the Proceedings of the Society of Exploration Geophysicists Annual Meeting, 15-20 Sep 2019.
- **The natural history of 'Oumuamua**.
  The 'Oumuamua ISSI Team; 14 equal-authored colleagues including **M. T. Bannister**. (9 pp).
  Nature Astronomy, a Perspective, 2019. doi:10.1038/s41550-019-0816-x

- **Col-OSSOS: the Colours of the Outer Solar System Origins Survey**.
  M. E. Schwamb, W. C. Fraser, **M. T. Bannister**, *M. Marsset, R. E. Pike, J. J. Kavelaars and 13 colleagues.* (32 pp.)
  Accepted to The Astrophysical Journal Supplement Series. arXiv:1809.08501
  - Invited general-readership article "By light alone: mapping the Solar System's past", *American Scientist*, (106):5, special issue *Big Data takes on the Universe*, Sep/Oct 2018.
- **OSSOS: XIII. Fossilised resonant dropouts tentatively confirm Neptune's migration was grainy and slow.**
  S.M. Lawler, R. E. Pike, N. Kaib and 7 colleagues including **M. T. Bannister**. (17 pp).
  Accepted to The Astronomical Journal. arXiv:1808.02618
- **OSSOS: XII. Variability studies of trans-Neptunian objects using the Hyper-Suprime Camera**.
  M. Alexandersen and 13 colleagues including **M. T. Bannister**. (20 pp).
  Accepted to The Astrophysical Journal Supplement Series. arXiv:1812.04304
- **A hypothesis for the rapid formation of planets**.
  S. Pfalzner and **M. T. Bannister**. The Astrophysical Journal Letters, 874, L34 (7 pp), 2019. arXiv:1903.04451
  - Highlighted in *AAS Nova*
  - Coverage in *New Scientist*, *Physics World*, *Scientific American*, *BBC World Service*
- **Col-OSSOS: colour and inclination are correlated throughout the Kuiper belt**.
  M. Marsset, W. C. Fraser, R. E. Pike, **M. T. Bannister** *and 8 colleagues.* The Astronomical Journal, 157:94 (17 pp), 2019. arXiv:1812.02190
- **OSSOS: XI. No active Centaurs in the Outer Solar System Origins Survey.**
  N. Cabral, A. Guilbert-Lepoutre, W. C. Fraser, and 10 colleagues including **M. T. Bannister**. Astronomy & Astrophysics, Volume 621, id.A102 (7 pp). 2019. arXiv:1810.03648
- **Solar System science with the Wide-Field InfraRed Survey Telescope (WFIRST).**
  B.J. Holler, S.N. Milam, J.M. Bauer, and 28 colleagues including **M. T. Bannister**. Journal of Astronomical Telescopes, Instruments, and Systems, 4(3), 034003 (28 pp), 2018. arXiv:1709.02763
- **Ground-penetrating radar profile of Beacon Valley, Dry Valleys, Antarctica: analysis of the GPR response from rocky permafrost**.
  D. C. Nobes, R. S. Sletten, **M. T. Bannister**, *M. J. Godfrey.* Proceedings of GPR2018: 17th International Conference on Ground Penetrating Radar, Rapperswil, Switzerland. (4 pp). 2018. doi:10.1109/ICGPR.2018.8441595
- **OSSOS: X. How to use a Survey Simulator: statistically robust testing of dynamical models against the real Kuiper belt**.
  S.M. Lawler, J.J. Kavelaars, and 5 colleagues including **M. T. Bannister**. *From Comets to Pluto & Beyond: KBOs & Investigations*, Frontiers in Astronomy and Space Sciences, 5 (14 pp), 2018. arXiv:1802.00460
- **OSSOS: IX. Two objects in Neptune's 9:1 resonance — implications for resonance sticking in the scattering population.**
  K. Volk, R. A. Murray-Clay, B. J. Gladman, S. M. Lawler, T. Y. M. Yu, and 10 colleagues including **M. T. Bannister**. The Astronomical Journal, 155:260 (9 pp), 2018. arXiv:1802.05805
- **OSSOS: VIII. The transition between two size distribution slopes in the scattering disk.**
  S. M. Lawler, C. Shankman, J.J. Kavelaars and 9 colleagues including **M. T. Bannister**. The Astronomical Journal, 155(5):197 (9 pp), 2018. arXiv:1803.07521
- **OSSOS: VII. 800+ trans-Neptunian objects — the complete data release.**
  M. T. Bannister, *B. J. Gladman, J.J. Kavelaars, J.-M. Petit, K. Volk, Y.-T. Chen, M. Alexandersen, S. Gwyn, M. E. Schwamb and 27 colleagues.* Invited paper, special issue *Data: Insights and Challenges in a Time of Abundance*, The Astrophysical Journal Supplement Series, 236(1):18, (19 pp), 2018. arXiv:1805.11740
  - Invited general-readership article "Beyond Neptune: distant minor planets (840 of them!) reveal the outer Solar System", *The Planetary Report*, March Equinox issue (6 pp), 2018. Sent to 50k members of *The Planetary Society*.
  - General-readership article "How we discovered 840 minor planets beyond Neptune — and what they can tell us", *The Conversation*, which has been read over 110,000 times.

  - Suggested the title that was chosen for the ApJS special issue.
  - ApJS special issue highlighted by AAS Nova.

- **A dwarf planet class object in the 21:5 resonance with Neptune**.
M. J. Holman, M. J. Payne, W. Fraser, P. Lacerda, **M. T. Bannister** *and 31 colleagues.* The Astrophysical Journal Letters, 855:L6 (9 pp), 2018. arXiv:1709.05427

- **(*) The tumbling rotational state of 1I/'Oumuamua.**
W. C. Fraser, P. Pravec, A. Fitzsimmons, P. Lacerda, **M. T. Bannister**, *C. Snodgrass, I. Smolić.* Nature Astronomy, (4 pp) 2018. arXiv:1711.11530

  - Featured in BBC *Sky at Night* episode on 'Oumuamua.
  - Discussed in cover article, *New Scientist*

- **(*) Spectroscopy and thermal modelling of the first interstellar object 1I/2017 U1 'Oumuamua.**
A. Fitzsimmons, C. Snodgrass, B. Rozitis, B. Yang, M. Hyland, T. Seccull, **M. T. Bannister**, *W. C. Fraser, R. Jedicke, P. Lacerda.* Nature Astronomy, (5 pp), 2017. arXiv:1712.06552

  - Coverage in over 130 media outlets worldwide, including *The Atlantic*, the *Guardian* and *Nature* editorial.
  - Interviewed for *BBC Radio 4* three times, e.g. December 18, 2017 recording from 20:34
  - Featured in *BBC Sky at Night* episode on 'Oumuamua.

- **(*) Col-OSSOS: colors of the interstellar planetesimal 1I/'Oumuamua.**
M. T. Bannister, *M. E. Schwamb, W. C. Fraser, M. Marsset, A. Fitzsimmons, S. Benecchi, P. Lacerda, R. E. Pike and 5 colleagues.* The Astrophysical Journal Letters, 851(2):L38 (7 pp), 2017. arXiv:1711.06214

  - Coverage by *National Geographic*, *The Independent*, *CBC News*, *Wired UK*, *AAS*, & an hour-long podcast.
  - Featured in *The Nib* graphical illustrated narrative "Cosmic Driftwood".
  - Invited article for "A Passion for Space" column, BBC *Sky at Night*'s magazine, March 2018.
  - Featured interview in BBC *Sky at Night* episode on 'Oumuamua.

- **Col-OSSOS: z-band photometry reveals three distinct trans-Neptunian object surface types.**
R. E. Pike, W. Fraser, M. E. Schwamb, M. Marsset, **M. T. Bannister**, *S.-Y. Wang, M. J. Lehner and 6 colleagues.* The Astronomical Journal, 154(3):101 (11 pp), 2017. arXiv:1708.03079

- **OSSOS VI. Striking biases in the detection of large semimajor axis trans-Neptunian objects.**
C. Shankman, J.J. Kavelaars, **M. T. Bannister**, *B. J. Gladman, S. M. Lawler, and 7 colleagues.* The Astronomical Journal, 154(2):50 (12 pp), 2017. arXiv:1706.05348

  - Coverage in *The Globe & Mail*, *Science*, *Nature.com*, *Sky & Telescope*, *Forbes.com*, *Neue Zürcher Zeitung*.

- **OSSOS: V. Diffusion in the orbit of a high-perihelion distant Solar System object.**
M. T. Bannister, *C. Shankman, K. Volk, Y.-T. Chen, N. Kaib, B. J. Gladman, M. Jakubik, J. J. Kavelaars, W. Fraser, M. E. Schwamb, J.-M. Petit, S.-Y. Wang, S. D. J. Gwyn, M. Alexandersen, R. E. Pike.* The Astronomical Journal, 153(6):262 (15 pp), 2017. arXiv:1704.01952

  - General-readership article "Our discovery of a minor planet beyond Neptune shows there might not be a 'Planet Nine' after all", *The Conversation*, which has been read over 175,000 times.
  - Coverage of related conference presentation at AAS DPS in *Nature.com* and *Science*

- **The splitting of double-component active asteroid P/2016 J1 (PANSTARRS)**.
F. Moreno and 22 colleagues including **M. T. Bannister**. The Astrophysical Journal Letters, 837(1):L3 (6 pp), 2017. arXiv:1702.03665

- **All planetesimals born near the Kuiper Belt formed as binaries**.
W. Fraser, **M. T. Bannister**, *R. E. Pike, and 19 colleagues.* Nature Astronomy, 1:0088 (6 pp), 2017. arXiv:1705.00683

  - Press release by Gemini Observatory highlighted by the US National Science Foundation

- **Consequences of a distant massive planet on the large semi-major axis trans-Neptunian objects**.
C. Shankman, J.J. Kavelaars, S. M. Lawler, B. J. Gladman, **M. T. Bannister**. The Astronomical Journal, 153(2):63 (9 pp), 2017. arXiv:1610.04251

- **Observational signatures of a massive distant planet on the scattering disk**.
S. M. Lawler, C. Shankman, N. Kaib, **M. T. Bannister**, *J.J. Kavelaars, B. Gladman.* The Astronomical Journal, 153(1):33 (7 pp), 2017. arXiv:1605.06575
- **OSSOS: IV. Discovery of a dwarf planet candidate in the 9:2 resonance with Neptune**.
M. T. Bannister *and 34 colleagues.* The Astronomical Journal, 152(6):212 (8 pp), 2016. arXiv:1607.06970
  - New Distant Dwarf Planet Beyond Neptune. *Canada-France-Hawaii Telescope* press release, 11 July 2016. Coverage in > 100 media outlets worldwide, including *CBC*, *EOS*, *The Globe and Mail*, *The Guardian*, *National Geographic*, *The New York Times*, *Radio New Zealand*, and *Sky and Telescope*.
- **TRIPPy: Trailed Image Photometry in Python**.
W. Fraser, M. Alexandersen, M. E. Schwamb, M. Marsset, R. Pike, J.J. Kavelaars, **M. T. Bannister**, *S. Benecchi, A. Delsanti.* The Astronomical Journal, 151(6):158 (7 pp), 2016. arXiv:604.00031. Software on GitHub.
- **OSSOS III – Resonant trans-Neptunian populations: constraints from the first quarter of the Outer Solar System Origins Survey**.
K. Volk, R. Murray-Clay, B. J. Gladman and 10 colleagues including **M. T. Bannister**. The Astronomical Journal, 152(1):23 (25 pp), 2016. arXiv:1604.08177
  - Highlighted in AAS/IOP Science Editorial Board's Focus on Planetary Science, October 2016
- **OSSOS. II. A sharp transition in the absolute magnitude distribution of the Kuiper belt's scattering population**.
C. Shankman, J.J. Kavelaars, B. J. Gladman and 8 colleagues including **M. T. Bannister**. The Astronomical Journal, 151(2):31 (11 pp), 2016. arXiv:1511.02896
  - Highlighted in AAS/IOP Science Editorial Board's Focus on Planetary Science, October 2016
- **(*) The Outer Solar System Origins Survey. I: design and first-quarter discoveries**.
M. T. Bannister, *J.J. Kavelaars, J.-M. Petit, B. J. Gladman, S. Gwyn, K. Volk, Y.-T. Chen, M. Alexandersen, and 31 colleagues.* The Astronomical Journal, 152(3):70 (25 pp), 2016. arXiv:1511.02895
  - Highlighted in AAS/IOP Science Editorial Board's Focus on Planetary Science, October 2016
- **Physical characterization of TNOs with the James Webb Space Telescope**.
A. Parker, N. Pinilla-Alonso, P. Santos Sans, J. Stansberry, and 11 colleagues including **M. T. Bannister**. Publications of the Astronomical Society of the Pacific, 128(959):018010 (6 pp), 2016. arXiv:1511.01112
- **A serendipitous all sky survey for bright objects in the outer Solar System**.
M. E. Brown, **M. T. Bannister**, *B. P. Schmidt, and 9 colleagues.* The Astronomical Journal, 149(2):69 (6 pp), 2015. arXiv:1501.00941
- **A portrait of the extreme solar system object 2012 DR$_{30}$**.
Cs. Kiss, Gy. Szabó, J. Horner, and 15 colleagues including **M. T. Bannister**. Astronomy & Astrophysics, 555:A3 (13 pp), 2013. arXiv:1304.7112
- **(*) 2008 LC$_{18}$: a potentially unstable Neptune Trojan.**
J. Horner, P. Lykawka, **M. T. Bannister**, *P. Francis.* Monthly Notices of the Royal Astronomical Society, 422(3):2145 (7 pp), 2012. arXiv:1202.3279
- **3D time-lapse imaging of polygonal patterned ground in the McMurdo Dry Valleys of Antarctica.**
M. J. Godfrey, **M. T. Bannister**, *D. C. Nobes, R. S. Sletten.* 6 pp. Proceedings of the 12$^{\text{th}}$ International Conference on Ground Penetrating Radar, Birmingham, UK, 2008. (pdf)

TECHNICAL PUBLICATIONS

- More than eight hundred and twenty-five **trans-Neptunian object discovery and orbit-update announcements** in Minor Planet Electronic Circulars (a third of all the currently known TNOs).
M. T. Bannister, *J.J. Kavelaars, J.-M. Petit, B. J. Gladman, T. Burdullis, S. Gwyn, Y.-T. Chen.* Minor Planet Center of the International Astronomical Union, Cambridge, USA. 2015–19.

- **Exploring the trans-Neptunian Solar System.**
  A. Guilbert, **M. T. Bannister**, *B. Holler and colleagues.* 2019. White paper for Voyage 2050: long-term planning of the European Space Agency science programme.
- **Ice giant systems: the scientific potential of missions to the Uranus and Neptune systems.**
  L. N. Fletcher and colleagues including **M. T. Bannister**. (30 pp). 2019. White paper for Voyage 2050: long-term planning of the European Space Agency science programme. arXiv:1907.02963
- **Maximizing LSST Solar System science: approaches, software tools, and infrastructure needs**.
  H. Hsieh, **M. T. Bannister**, *W.C. Fraser, M.S. Kelley, M.M. Knight, C. A. Thomas.* (83 pp). 2019. arXiv:1906.11346
- **The detailed science case for the Maunakea Spectroscopic Explorer, 2019 edition**.
  The MSE Science Team, including **M. T. Bannister**. 2019. arXiv:1904.04907
- **"My God, it's full of asteroids": Solar System science with a large field of view**.
  B.J. Holler, S.N. Milam, J.M. Bauer, and 28 colleagues including **M. T. Bannister**. 2019. White paper for Astro2020, the US Astronomy Decadal Survey.
- **A software roadmap for Solar System science with the Large Synoptic Survey Telescope.**
  M.E. Schwamb, H. Hsieh, **M. T. Bannister** *and 8 colleagues.* 2019. Research Notes of the AAS. doi:10.3847/2515-5172/ab0e10
- **A northern ecliptic survey for Solar System science: a response for the Call for LSST Cadence Optimization White Papers.**
  M.E. Schwamb and 13 colleagues including **M. T. Bannister**. 2018. arXiv:1812.01149
- **Deep drilling fields for Solar System science: a response to the Call for LSST Cadence Optimization White Papers.**
  D. E. Trilling and 6 colleagues including **M. T. Bannister**. 2018. arXiv:1812.09705
- **The effects of filter choice on outer Solar System science with LSST: a response to the Call for LSST Cadence Optimization White Papers**.
  K. Volk and 8 colleagues including **M. T. Bannister**. 2018. arXiv:1812.00937
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