Nathaniel Starkman

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Publications arXiv Zenodo 0000-0003-3954-3291

Education

2018 – 2024	**PhD in Astronomy & Astrophysics**, University of Toronto	Toronto, ON, Canada
2014 – 2018	**B.S. in Mathematical Physics and Astronomy**, Case Western Reserve University	Cleveland, OH, USA

Professional Appointments

2024 – 2027	**Postdoctoral Associate**, MIT Kavli Institute for Astrophysics and Space Research	Cambridge, MA, USA
2021 –	**Coordinator (2025 – 2028), Strategic Planner (2025 – 2026) & Core Developer**, Astropy	Remote

Grants & Fellowships

Feb 2024	**Brinson Prize Fellowship**	USD 360,000
2020 – 2023	**NSERC - CGS D**	CAD 105,000
2018 – 2024	**University of Toronto Graduate Fellowship**, University of Toronto	CAD 23,000–32,000 p.a.

Awards

Jan 2025 **AAS Lancelot M. Berkeley–New York Community Trust Prize**, American Astronomical Society, *to the Astropy Collaboration*

Publications

Students I supervised or advised: undergraduate†, graduate‡.

5. Euclid Collaboration, **N. Starkman**, J. Nibauer, S. Pearson, S. Wu‡, M. Walmsley, L. Necib, et al. *Euclid Quick Data Release (Q1): The geometry of dark matter halos from extragalactic streams.* Astronomy & Astrophysics SUBMITTED ADS arXiv:2606.21774
4. C. Myers†, **N. Starkman**, L. Necib. *Reconstructing Galactic Gravitational Potentials from Stellar Kinematics with Physics-Informed Neural Networks.* Monthly Notices of the Royal Astronomical Society SUBMITTED ADS arXiv:2606.18386
3. S. Wu‡, **N. Starkman**, S. Pearson, J. Nibauer, J. Miro-Carretero, D. Martinez-Delgado. *Potamides: Mapping Dark Matter Halo Shapes from Stellar Stream Tracks in the Local Universe.* The Astrophysical Journal ACCEPTED ADS arXiv:2605.07809
2. **N. Starkman**, J. Nibauer, J. Bovy, J. Webb, K. Tavangar, A. Price-Whelan, et al. *Stream Members Only: Data-Driven Characterization of Stellar Streams with Mixture Density Networks.* The Astrophysical Journal 980, 253 10.3847/1538-4357/ad94f2 ADS arXiv:2311.16960
1. **N. Starkman**, J. Bovy, J. Webb, D. Calvetti, E. Somersalo. *On the fast track: Rapid construction of stellar stream paths.* Monthly Notices of the Royal Astronomical Society 522, 5022 10.1093/mnras/stad1166 arXiv:2212.00949

Software Development

phasecurvefit 2026
Paths through phase space

potamides 2026
Constrain gravitational potentials from stellar stream curvature

galax
Galactic dynamics in JAX

coordinax
Coordinates in JAX

unxt 2025
Units in JAX

Astropy 2022
Astronomy in Python