CV - DOLEV BASHI

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Research Interests

Exoplanets-- Binary stars-- Galactic archaeology-- Compact objects-- Space engineering

Appointments

Blavatnik Cambridge Fellow; Didier Queloz's group — 2023-Present

Astrophysics group, Cavendish Laboratory, University of Cambridge

Research associate; Tsevi Mazeh's group — 2021 - 2023

School of Physics and Astronomy, Tel-Aviv University

Education

Ph.D.: School of Geosciences, Tel-Aviv University; Advisor: Shay Zucker — 2017 – 2022

M.Sc. (summa cum laude): Department of Geophysics & Planetary Sciences, Tel-Aviv University; Advisors: Ravit Helled, Shay Zucker — 2015 – 2017

B.Sc.: School of Physics and Astronomy, Tel-Aviv University — 2008 – 2011

Refereed Publications

(13 First-author, 30 total, full list at ADS)

First-Author Publications:

1. **D. Bashi**, Do Outer Giants Inflate Neptune-sized Planets? An Architecture-Dependent Mass-Radius Relation, MNRAS, L544, 51, (2025) doi: 10.1093/mnrasl/slaf098.
2. **D. Bashi** & Belokurov, V., Fewer companions in the crowd: the low close binary fraction in globular clusters from Gaia RVS, MNRAS, 541, 2008 (2025) doi: 10.1093/mnras/staf1102.
3. **D. Bashi** & Tokovinin, A., Searching for compact hierarchical triple system candidates in astrometric binaries and accelerated solutions, A&A, 692, A247 (2024) doi:10.1051/0004-6361/202452637.
4. **D. Bashi**, Belokurov, V. and Hodgkin, S., Close binary fractions in accreted and in situ halo stars, MNRAS, 535, 949 (2024) doi:10.1093/mnras/stae2385.
5. **D. Bashi**, Mazeh, T. and Faigler, S., Different Planetary Eccentricity-period (PEP) Distributions of Small and Giant Planets, AJ, 168, 115 (2024) doi:10.3847/1538-3881/ad5ffa.
6. **D. Bashi**, Mazeh, T. and Faigler, S., Features of Gaia DR3 spectroscopic binaries I. Tidal circularization of main-sequence stars, MNRAS, 522, 1184 (2023) doi:10.1093/mnras/stad999.
7. **D. Bashi**, Shahaf, S., Mazeh, T., et al., Gaia spectroscopic orbits validated with LAMOST and GALAH radial velocities, MNRAS, 517, 3888 (2022) doi:10.1093/mnras/stac2928.

8. **D. Bashi** & Zucker, S., Exoplanets in the Galactic context: planet occurrence rates in the thin disc, thick disc, and stellar halo of Kepler stars, MNRAS, 510, 3449 (2022) doi:10.1093/mnras/stab3596.

9. **D. Bashi** & Zucker, S., Quantifying the similarity of planetary system architectures, A&A, 651, A61 (2021) doi:10.1051/0004-6361/202140699.

10. **D. Bashi**, Zucker, S. and Adibekyan, V., Occurrence rates of small planets from HARPS. Focus on the Galactic context, A&A, 643, A106 (2020) doi:10.1051/0004-6361/202038881.

11. **D. Bashi** & Zucker, S., Small Planets in the Galactic Context: Host Star Kinematics, Iron, and Alpha-element Enhancement, AJ, 158, 61 (2019) doi:10.3847/1538-3881/ab27c9.

12. **D. Bashi**, Helled, R. and Zucker, S., A Quantitative Comparison of Exoplanet Catalogs, Geosciences, 8, 325 (2018) doi:10.3390/geosciences8090325.

13. **D. Bashi**, Helled, R., Zucker, S., et al., Two empirical regimes of the planetary mass-radius relation, A&A, 604, A83 (2017) doi:10.1051/0004-6361/201629922.

Second-Author and Key Contribution Publications:

1. N. Sussholz, S. Zucker, R. Helled, **D. Bashi**, Stellar chemistry and planet size: insights from GALAH DR4, A&A, submitted (2025).

2. D. Katz, A. Gómez, … D. Bashi, et al., Gaia DR3 high radial velocity stars: genuine fast moving objects or outliers?, A&A, accepted (2025).

3. Simhony, Y., Segal, A., **D. Bashi**, et al., *Spaceborne COTS-Capsule hodoscope: Detecting and characterizing particle radiation*, Nuclear Instruments and Methods in Physics Research A, 1070, 169996 (2025) doi:10.1016/j.nima.2024.169996.

4. Gaia Collaboration, Panuzzo, P., … **D. Bashi**, et al., *Discovery of a dormant 33 solar-mass black hole in pre-release Gaia astrometry*, A&A, 686, L2 (2024) doi:10.1051/0004-6361/202449763.

5. Verker, R., Keren, E., … **D. Bashi**, et al., *Measurements of material erosion in space by atomic oxygen using the on-orbit material degradation detector*, Acta Astronautica, 211, 818 (2023) doi:10.1016/j.actaastro.2023.07.020.

6. Gomel, R., Mazeh, T., … **D. Bashi**, et al., *Gaia Data Release 3. Ellipsoidal variables with possible black hole or neutron star secondaries*, A&A, 674, A19 (2023) doi:10.1051/0004-6361/202243626.

7. El-Badry, K., Rix, H.-W., … **D. Bashi**, et al., *A red giant orbiting a black hole*, MNRAS, 521, 4323 (2023) doi:10.1093/mnras/stad799.

8. Pawlak, M., Mazeh, T., … **D. Bashi**, et al., *Spectroscopic Discovery of Binaries with Dormant Black Holes*, The Messenger, 190, 17 (2023) doi:10.18727/0722-6691/5303.

9. Shahaf, S., **D. Bashi**, Mazeh, T., et al., *Triage of the Gaia DR3 astrometric orbits - I. A sample of binaries with probable compact companions*, MNRAS, 518, 2991 (2023) doi:10.1093/mnras/stac3290.

10. El-Badry, K., Rix, H.-W., … **D. Bashi**, et al., *A Sun-like star orbiting a black hole*, MNRAS, 518, 1057 (2023) doi:10.1093/mnras/stac3140.

11. Mazeh, T., Faigler, S., **D. Bashi**, et al., *Probable dormant neutron star in a short-period binary system*, MNRAS, 517, 4005 (2022) doi:10.1093/mnras/stac2853.

Other Publications:

1. Gaia Collaboration, Krone-Martins, A., … **D. Bashi**, et al., *Gaia Focused Product Release: A catalogue of sources around quasars to search for strongly lensed quasars*, A&A, 685, A130 (2024) doi:10.1051/0004-6361/202347273.

2. Gaia Collaboration, Schultheis, M., … **D. Bashi**, et al., *Gaia Focused Product Release: Spatial distribution of two diffuse interstellar bands*, A&A, 680, A38 (2023) doi:10.1051/0004-6361/202347103.

3. Gaia Collaboration, David, P., … **D. Bashi**, et al., *Gaia Focused Product Release: Asteroid orbital solution. Properties and assessment*, A&A, 680, A37 (2023) doi:10.1051/0004-6361/202347270.

4. Gaia Collaboration, Trabucchi, M., … **D. Bashi**, et al., *Gaia Focused Product Release: Radial velocity time series of long-period variables*, A&A, 680, A36 (2023) doi:10.1051/0004-6361/202347287.

5. Gaia Collaboration, Weingrill, K., … **D. Bashi**, et al., *Gaia Focused Product Release: Sources from Service Interface Function image analysis. Half a million new sources in omega Centauri*, A&A, 680, A35 (2023) doi:10.1051/0004-6361/202347203.

6. Eyer, L., Audard, M., … **D. Bashi**, et al., *Gaia Data Release 3. Summary of the variability processing and analysis*, A&A, 674, A13 (2023) doi:10.1051/0004-6361/202244242.

Scholarships and Honors

Blavatnik Cambridge Fellowship	2023
The Akiva Bar-Nun scholarship for excellence	2019
Dean's scholarship for academic excellence	2017

Talks and Posters

Talk: Fewer Companions in the Crowd: The Low Close Binary Fraction in Globular Clusters from Gaia RVS (National Astronomy Meeting, Durham University)	Jul 2025
Poster: Identifying Compact Hierarchical Triples in Gaia Astrometric Binaries (EAS 2025, University College Cork)	Jun 2025
Poster: Different Planetary Eccentricity-period (PEP) Distributions of Small and Giant Planets (Exoplanets V, Leiden)	Jun 2024
Talk: Nanosatellites and the New Space revolution (Hills seminar series, University of Cambridge)	Feb 2024

Talk: Exoplanets in the Galactic Context (ExoCam seminar, University of Cambridge)	Nov 2023
Talk: Tidal circularization of main-sequence stars (IoA colloquia, University of Cambridge)	Nov 2023
Poster: Searching for Exoplanets in Halo Stars (Blavatnik Cambridge Fellowships Reception, House of Lords, London)	Mar 2023
Talk: Tidal circularization of main-sequence stars (Wise 50, Mitzpe-Ramon, Israel)	Mar 2023
Talk: Gaia Spectroscopic Orbits Validation with external Radial Velocity Surveys (MW-*Gaia* WG2/1 Workshop, Naples)	Sep 2022
Invited Talk: Exoplanets in the Galactic context: Planet occurrence rates in the thin disk, thick disk, and stellar halo of Kepler stars (Weizmann Institute of Science)	Jan 2022
Poster: Quantifying the similarity of planetary system architectures (TESS Science Conference II – virtual)	Aug 2021
Invited Talk: Nanosatellites and the new space revolution (Technion, Haifa)	Feb 2021
Poster: Occurrence rates of small planets from HARPS: Focus on the Galactic context (Exoplanets III, Heidelberg - virtual)	Aug 2020
Talk: Small Planets in the galactic context- the era of *Gaia* (MW-*Gaia* WG3 Workshop, Porto)	Nov 2019
Talk: Small Planets in the galactic context (The Hebrew University of Jerusalem)	Jun 2019
Invited Talk: Two empirical regimes of the planetary mass-radius relation (University of Zurich, University of Bern)	Apr 2018

MENTORING

Part III projects (2 X M.Sc. students), University of Cambridge	2023-2024

Teaching

Teaching assistance Space Engineering course, Tel-Aviv University	2022

Observing Experience

LCO 10h using NRES	2022A
LCO 10h using NRES	2021B

Reviewer for Journals

Astronomy & Astrophysics (A&A)

Monthly Notices of the Royal Astronomical Society (MNRAS)

Astronomical Journal (AJ)

Space based projects

As system engineer and integrator, I have led the development and integration of multiple CubeSat missions:

TEVEL-2: system-engineer, integrator and mentoring of nine high-school groups developing a 1U CubeSat including a dedicated cosmic rays and radiation sensors (mostly remote). 2022-2025

TAUSAT-2: system-engineer and integrator of a 2U CubeSat aimed for a demonstration of novel communication protocol + LED experiment to be observed from the ground. 2021-2023

TAU COTS-Capsule: an integrator of a radiation payload experiment sent to the ISS. 2021-2022

TEVEL-1: mentoring eight high-school groups developing a 1U CubeSat, including retroreflector payloads. 2020-2024

Outreach

Teaching coding and programming to a joint group of American and Israeli high-school students as part of the America-Israel Friendship League (AIFL)

Mentor of TEVEL ('students building satellites' - in Hebrew) project

Lecturing astronomy to school students of all ages

Others

Committee member and organizer of the University of Cambridge Exoplanet seminar series (ExoCam)

Amateur radio licenses 4X5RF