

Nimrod Gavriel

Atmospheric dynamics & planetary science

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Appointments

- 2026-present **Postdoctoral Fellow**
University of California, Berkeley
Earth and Planetary Science | Host: William R. Boos
- 2025 **Postdoctoral Fellow**
Weizmann Institute of Science
Earth and Planetary Science | Host: Yohai Kaspi

Education

- 2020-2024 **PhD, Atmospheric Dynamics**
Weizmann Institute of Science
Advisor: Yohai Kaspi
- 2017-2019 **MSc, Energy Engineering**
Technion, Israel Institute of Technology
Summa cum laude | Advisor: Guy Ramon
- 2013-2017 **BSc, Civil and Environmental Engineering**
Technion, Israel Institute of Technology
Summa cum laude

Publications

UNDER REVIEW

Planetary-Scale Convective Columns Detected on Jupiter

Gavriel, N.; Duer-Milner, K.; Galanti, E.; Oyafuso, F. A.; Li, C.; Levin, S. M.; Bolton, S. J.; Kaspi, Y.
Manuscript in review

PUBLISHED

Dynamical constraints on the vertical structure of Jupiter's polar cyclones

Gavriel, N.; Kaspi, Y.

2025, Proceedings of the National Academy of Sciences, 122 (44), e2503737122

Published version | [arXiv preprint](#)

From gas to ice giants: A unified mechanism for equatorial jets

Duer-Milner, K.; **Gavriel, N.**; Galanti, E.; Tziperman, E.; Kaspi, Y.

2025, Science Advances, 11 (41), eads8899

Published version | [arXiv preprint](#)

Observational evidence for cylindrically oriented zonal flows on Jupiter

Kaspi, Y.; Galanti, E.; Park, R. S.; Duer, K.; **Gavriel, N.**; Durante, D.; Less, L.; Parisi, M.; Buccino, D. R.; Guillot, T.; Stevenson, D. J.; Bolton, S. J.

2023, Nature Astronomy, 7 (12), 1463-1472

Published version

The Westward Drift of Jupiter's Polar Cyclones Explained by a Center-of-Mass Approach

Gavriel, N.; Kaspi, Y.

2023, Geophysical Research Letters, 50 (19), e2023GL103635

Published version | [arXiv preprint](#)

The Oscillatory Motion of Jupiter's Polar Cyclones Results From Vorticity Dynamics

Gavriel, N.; Kaspi, Y.

2022, Geophysical Research Letters, 49 (15), e2022GL098708

Published version | [arXiv preprint](#)

Evidence for Multiple Ferrel-Like Cells on Jupiter

Duer, K.[†]; **Gavriel, N.**[†]; Galanti, E.; Kaspi, Y.; Fletcher, L. N.; Guillot, T.; Bolton, S. J.; Levin, S. M.; Atreya, S. K.; Grassi, D.; Ingersoll, A. P.; Li, C.; Li, L.; Lunine, J. I.; Orton, G. S.; Oyafuso, F. A.; Waite, J. H.

2021, Geophysical Research Letters, 48 (23), e2021GL095651

[†] Equal contribution

Published version | [arXiv preprint](#)

The number and location of Jupiter's circumpolar cyclones explained by vorticity dynamics

Gavriel, N.; Kaspi, Y.

2021, Nature Geoscience, 14 (8), 559-563

Nature Geoscience cover · August 2021

Published version | [arXiv preprint](#)

Phase-dependence of sorption-induced mass streaming in an acoustic field

Blayer, Y.[†]; **Elkayam, N.**[†]; Ramon, G. Z.

2019, Applied Physics Letters, 115 (3), 033703

[†] Equal contribution

Published version

Acoustic oscillations driven by boundary mass exchange

Offner, A.; Yang, R.; Felman, D.; **Elkayam, N.**; Agnon, Y.; Ramon, G. Z.

2019, Journal of Fluid Mechanics, 866, 316-349

Published version

Fellowships and awards

2025	CHE/PBC fellowship for postdoctoral training abroad in Climate and Energy Sciences Planning and Budgeting Committee, Council for Higher Education (Israel)
2025	Rothschild Fellowship Yad Hanadiv
2025	Next-Generation Environmental Sustainability Postdoctoral Award Institute for Environmental Sustainability, Weizmann Institute of Science
2024	Prof. Israel Dostrovsky Memorial Prize of Excellence Weizmann Institute of Science and Israel Atomic Energy Commission
2023	GFD Fellow Geophysical Fluid Dynamics Program, Woods Hole Oceanographic Institution
2021	Pearlman Grant for Student-Initiated Research Faculty of Chemistry, Weizmann Institute of Science
2017-2019	Scholarship for excellence Israel Ministry of Energy

Teaching experience

- 2022-2023 **Weizmann Institute of Science**
 Teaching assistant
 Planetary Atmospheres
 Atmospheric and Oceanic Fluid Dynamics
- 2016-2019 **Technion**
 Teaching assistant
 Structural Analysis (2017-2019); Quantitative Thinking and Statistics (2018-2019); Introduction to Environmental Engineering (2017-2018); Introduction to Engineering Mechanics (2016-2017)

Peer review

Reviewer since 2022 for Nature Geoscience, Nature Communications, PNAS, Earth and Planetary Science Letters, and Icarus.

Seminars

- Feb 2026 **Center for Integrative Planetary Science seminar, UC Berkeley** · Berkeley, California
 Talk: Jupiter's planetary-scale atmospheric circulations exposed by Juno Program
- Nov 2025 **Physics Department, Midreshet Ben-Gurion** · Sde Boker, Israel
 Talk: The Dynamics of Jupiter's Polar Cyclones
- Oct 2025 **Department of Geophysics, Tel Aviv University** · Tel Aviv, Israel
 Talk: The Dynamics of Jupiter's Polar Cyclones
- Sep 2025 **Environmental Engineering, Technion** · Haifa, Israel
 Talk: The Dynamics of Jupiter's Polar Cyclones
- Jun 2025 **Institute of Earth Sciences, Hebrew University** · Jerusalem, Israel
 Talk: The Dynamics of Jupiter's Polar Cyclones
- Sep 2024 **PhD Defense Seminar, Weizmann Institute of Science** · Rehovot, Israel
 Talk: The Dynamics of Jupiter's Polar Cyclones
- Jun 2024 **Scripps Institution of Oceanography** · San Diego, California
 Talk: Jupiter's Circumpolar and Polar Cyclones: Understanding Their Static and Transient Properties Through Vorticity Dynamics
- Jun 2024 **Geological and Planetary Sciences, Caltech** · Pasadena, California
 Talk: Jupiter's Circumpolar and Polar Cyclones: Understanding Their Static and Transient Properties Through Vorticity Dynamics
- Jun 2024 **University of California, Santa Cruz** · Santa Cruz, California
 Talk: Jupiter's Circumpolar and Polar Cyclones: Understanding Their Static and Transient Properties Through Vorticity Dynamics
- Jun 2024 **University of California, Berkeley** · Berkeley, California
 Talk: Jupiter's Circumpolar and Polar Cyclones: Understanding Their Static and Transient Properties Through Vorticity Dynamics
- Aug 2023 **GFD Program, Woods Hole Oceanographic Institution** · Woods Hole, Massachusetts
 Talk: Can AI-based climate models learn rare, extreme weather events?

Conference and other presentations

- Sep 2026 **Europlanet Science Congress (EPSC 2026)** · The Hague, Netherlands · Oral presentation
 Talk: Evidence for Tilted Columnar Cells Driving Jupiter's Equatorial Jets
 Abstract
- Jan 2026 **Atmospheric and Oceanic Fluid Dynamics (AOFD 2026)** · Houston, Texas
 Talk: Dynamical Constraints on the Vertical Structure of Jupiter's Polar Cyclones

Jan 2026	Juno Atmospheric Working Group monthly meeting Talk: Evidence for Tilted Columnar Cells Driving Jupiter's Equatorial Jets
Sep 2025	Europlanet Science Congress / Division for Planetary Sciences Joint Meeting (EPSC-DPS 2025) · Helsinki, Finland Talk: The Dynamics of Jupiter's Polar Cyclones Abstract
Jul 2025	Israel Physical Society annual meeting (IPS 2025) · Haifa, Israel Talk: The Dynamics of Jupiter's Polar Cyclones
Mar 2025	Parameterizations for Global Dynamical Models in Climatology, Astrophysics and Planetology · Les Houches, France Talk: The Dynamics of Jupiter's Polar Cyclones
Jan 2025	International Space Science Conference · Tel Aviv, Israel Poster: Cyclone dynamics in an ideal environment: the motion and stability of Jupiter's circumpolar cyclones
Oct 2024	Division for Planetary Sciences (DPS 2024) Meeting · Virtual presentation Talk: The mechanisms controlling the temporal motion, evolution and stability of Jupiter's circumpolar cyclones
Jun 2024	Atmospheric and Oceanic Fluid Dynamics (AOFD 2024) · Burlington, Vermont Talk: The motion of Jupiter's polar cyclones explained by vorticity dynamics and a center-of-mass approach
Apr 2024	European Geosciences Union (EGU 2024) General Assembly · Vienna, Austria Talk: Vorticity-gradient forces and a center-of-mass approach explain the mean and oscillatory motion of Jupiter's polar cyclones Abstract
Sep 2022	Europlanet Science Congress (EPSC 2022) · Granada, Spain Talk: The oscillatory motion of the polar cyclones of Jupiter results from vorticity dynamics Abstract
Jun 2022	Juno's Prime Mission workshop · Pasadena, California
Jun 2022	Atmospheric and Oceanic Fluid Dynamics (AOFD 2022) · Breckenridge, Colorado Talk: The number, location, and oscillation of Jupiter's circumpolar cyclones explained by vorticity dynamics
May 2022	European Geosciences Union (EGU 2022) General Assembly · Vienna, Austria Talk: The number and location of Jupiter's circumpolar cyclones explained by vorticity dynamics
Apr 2022	Geophysical Fluid Dynamics (GFD 2022) Days · Sde Boker, Israel Talk: The number and location of Jupiter's circumpolar cyclones explained by vorticity dynamics
Jan 2022	Juno Atmospheric Working Group monthly meeting
Oct 2021	Moscow Solar System Symposium Talk: The number and location of Jupiter's circumpolar cyclones explained by vorticity dynamics
Oct 2021	Division for Planetary Sciences (DPS 2021) Meeting Talk: The number and location of Jupiter's circumpolar cyclones explained by vorticity dynamics
Sep 2021	Juno Atmospheric Working Group monthly meeting
Sep 2021	NASA Headquarters Monthly Science Report · Invited short talk Talk: The number and location of Jupiter's circumpolar cyclones explained by vorticity dynamics

Skills and interests

Languages: Hebrew, English, Spanish

Programming: Python, Matlab, Shell

Other interests: Music, climbing, painting