

ALLONA VAZAN

PERSONAL

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RESEARCH INTERESTS

Planet interior structure and evolution; planet formation; planet observation link to theory; solar system planets and objects: properties and evolution. Characterisation of exoplanets.

RESEARCH POSITIONS

- **2020-current:** Senior lecturer, Physics group, Department of Natural Sciences, The Open University of Israel.
- **2018-2020:** Dual postdoctoral position:
 - Astrophysics and Planetary Science group, Racah Institute of Physics, The Hebrew University of Jerusalem (HUJI), Israel.
 - Center for Theoretical Astrophysics and Cosmology, Institute for Computational Science, University of Zurich (UZH), Switzerland.
- **2015-2018:** AAA (Amsterdam Academic Alliance) postdoctoral fellow, Astronomical Institute Anton Pannekoek (API), University of Amsterdam (UvA), The Netherlands.

EDUCATION

- **2010-2015:** PhD in Planetary Science, Faculty of Exact Science, Tel Aviv University. *Subject:* Evolution of giant planets.
- **2008-2010:** MSc, in Planetary Sciences, *Summa Cum Laude*, Tel Aviv University. *Subject:* The effect of opacity on the evolution of giant planets
- **2002-2005:** BSc, in Physics, Technion - Israel Institute of Technology, Haifa.

COMMUNITY SERVICES AND RESPONSIBILITIES

- **2021:** Member of the Israeli Ministry of Science committee for prize fellowship.
- **2018-current:** Member of consortium of the PLATO space mission (ESA M3 mission).
- **2016-current:** Member of scientific teams of the ARIEL space mission (ESA M4 mission) - planet formation science team, planet interior science team.
- **2018-2020:** Member of scientific team: *formation and evolution of icy giants*, International Space Science Institute (ISSI), Bern, Switzerland.
- **2018:** PhD examiner and reading committee for K. Hakim, University of Amsterdam.
- **2017:** Member of the API Bachelor project prize committee.
- **2016:** Initiation of Forum for Young Scientists (FYS), soft skills for physics postdocs and PhD students, collaboration of Amsterdam universities.
- **2015:** Member of the API MSc thesis prize committee.
- Reviewer of international peer-review journals: The Astrophysical Journal (ApJ), Icarus, Astronomy & Astrophysics (A&A), Monthly Notices of the Royal Astronomical Society (MNRAS), Planetary and Space Science (PPS).

- Member of scientific committees: NASA Exoplanet Systems Science (NExSS), International Astronomy Union (IAU), European Planetary Sciences society (Europlanet), European Astronomical Society (EAS), Dutch Astronomy Committee (NAC).
- Member of institutional committees: Senate subcommittee, Steering committee - "Israeli Hope in Academia".

AWARDS AND GRANTS

- **2021:** Israel Science Foundation research grant (PI).
- **2021:** Israel Science Foundation computational equipment grant (PI).
- **2018:** Origin of Life Center the Netherlands, research grant (PI).
- **2015-2018:** Amsterdam Academic Alliance (AAA) postdoctoral fellowship.
- **2012-2015:** Ilan Ramon PhD fellowship, Israeli Ministry of Space and Science.
- **2012:** Faculty of Exact Sciences award for excellence.
- **2011:** Department of Geophysics and Planetary Science award for excellence.
- **2010:** Department of Geophysics and Planetary Science award for excellence.

SUPERVISION AND TEACHING

- **2021:** Supervision of Bachelor project, The Open University of Israel:
Solid accretion into planets formed by Gravitational Instability
- **2021:** 'Computational Physics' new course development, The Open University
- **2020:** Supervision of Bachelor project, The Hebrew University of Jerusalem:
Analysis of planet parameters from the TESS data
- **2019:** Supervision of Bachelor project, The Hebrew University of Jerusalem:
Modeling thermal evolution of sub-Neptune planets with gaseous envelopes.
- **2018:** Teaching, 'Astronomy workshop' course, University of Amsterdam.
- **2017:** Astronomy advisor, 'How to make an alien' course, University of Amsterdam.
- **2016-2017:** Supervision of Bachelor projects, University of Amsterdam:
 1. Effect of non-spherical particles on the opacity and evolution of planets.
 2. Giant impacts and the metallicity of planetary envelopes.
 3. Calculating the Brunt-Vaisala frequency for interior models of Saturn.
- **2009-2014:** Teaching assistant, Planetary Science, Tel Aviv University.
Courses: remote sensing, radiative transfer, mathematical introduction to physicists 1+2.

EMPLOYMENT

- **2005-2008:** Physicist in R&D unit, HP Indigo, Israel.
Team leader of technical group, researcher in multidisciplinary environment.
- **2004-2005:** Research assistant, Prof. E. Brown's biophysics laboratory, Technion.

SELECTED PEER REVIEW PUBLICATIONS

Complete list of publications: [A.Vazan at ADS](#)

- **Vazan A.**, Sari R., Kessel R. (2022) "*A new perspective on interiors of ice-rich planets: Ice-rock mixture rather than ice on top of rock*" - The Astrophysical Journal, Volume 926, Issue 2, id.150, 12 pp.
- Turini et al. (25 authors, alphabetic), **Vazan A.** (2021): "*Exploring the link between star and planet formation with Ariel*" - Experimental Astronomy, Volume 53, Issue 2, p.225-278

- Brouwers M. G., Ormel C. W., Bonsor A., **Vazan A.** (2021): “*How planets grow by pebble accretion IV: Envelope opacity trends from sedimenting dust and pebbles*” - Astronomy & Astrophysics, Volume 653, id.A103, 15 pp.
- Tinetti G., et al. (317 authors, alphabetic), **Vazan A.** (2021): “*Ariel: Enabling planetary science across light-years*” - Ariel Definition Study Report, 147 pages. Reviewed by ESA Science Advisory Structure in November 2020.
- Helled R. et al. (17 authors, alphabetic) **Vazan A.** (2021): “Ariel Planetary Interiors White Paper” - Accepted for publication in Experimental Astronomy; doi:10.1007/s10686-021-09739-3
- Ormel C., **Vazan A.**, Brouwers M. (2021) “*How planets grow by pebble accretion. III. Emergence of an interior composition gradient*” - Astronomy & Astrophysics, Volume 647, id.A175, 19 pp
- Carone L., Baeyens R., Mollière P., Barth P., **Vazan A.**, Decin L., Sarkis P., Venot O., Henning Th. (2020) “*Equatorial retrograde flow in WASP-43b elicited by deep wind jets?*” - Monthly Notices of the Royal Astronomical Society, Volume 496, Issue 3, pp.3582-3614.
- Nayakshin S., Tsukagoshi T., Hall C., **Vazan A.**, Helled R., Humphries J., Meru F., Neunteufel P., Panic O. (2020) “*TW Hya: an old protoplanetary disc revived by its planet*” - Monthly Notices of the Royal Astronomical Society, Volume 495, Issue 1, pp.285-304.
- **Vazan A.** & Sari R. (2020): “*On the aspect ratio of 'Oumuamua :regular shape and irregular surface*” - Monthly Notices of the Royal Astronomical Society, Volume 493, Issue 2, p.1546-1552.
- **Vazan A.** & Helled R. (2020): “*Explaining the low luminosity of Uranus: A self-consistent thermal and structural evolution*” - Astronomy & Astrophysics, Volume 633, id.A50, 10 pp..
- Humphries J., **Vazan A.**, Bonavita M., Helled R., Nayakshin S. (2019): “*Constraining the initial planetary population in the gravitational instability model*” - Monthly Notices of the Royal Astronomical Society, Volume 488, Issue 4, p.4873-4889.
- Hakim K., van den Berg A., **Vazan A.**, Höning D., van Westrenen W., Dominik C. (2019): “*Thermal evolution of rocky exoplanets with a graphite outer shell*” - Astronomy & Astrophysics, Volume 630, id.A152, 12pp.
- **Vazan A.**, Ormel C. W., Noack L., Dominik C. (2018): “*Contribution of the core to the thermal evolution of sub-Neptunes*” - The Astrophysical Journal, Volume 869, Issue 2, article id. 163, 11 pp.
- Tinetti G., et al. (241 authors, alphabetic), **Vazan A.** (2018): “*A chemical survey of exoplanets with ARIEL*” - Experimental Astronomy, Volume 46, Issue 1, pp.135-209
- **Vazan A.**, Helled R., Guillot T. (2018): “*Jupiter's evolution with primordial composition gradients*” - Astronomy & Astrophysics Letters, Volume 610, L14.
- Turrini, D., Miguel, Y., Zingales, T., Piccialli, A., Helled, R., **Vazan, A.**, et al. (2018): “*The contribution of the ARIEL space mission to the study of planetary formation*” - Experimental Astronomy, Volume 46, Issue 1, pp.45-65
- **Vazan A.**, Ormel C. W., Dominik C. (2018): “*Effect of core cooling on the radius of sub-Neptune planets*” - Astronomy & Astrophysics Letters , Volume 610, id.L1, 4 pp.
- *Brouwers M. G., **Vazan A.**, Ormel C. W. (2018): “*How cores grow by Pebble Accretion*” - Astronomy & Astrophysics, Volume 611, id.A65, 12 pp. (*paper led by my supervised student)

- **Vazan A.**, Helled R., Podolak M., Kovetz A. (2016): *"The evolution and internal structure of Jupiter and Saturn with compositional gradients"* - The Astrophysical Journal, Volume 829, Issue 2, article id. 118, 11 pp.
- **Vazan A.**, Helled R., Kovetz A., Podolak M. (2015): *"Convection and mixing in giant planet evolution"* - The Astrophysical Journal, Volume 803, Issue 1, article id. 32, 11 pp.
- **Vazan A.**, Kovetz A., Podolak M., Helled R. (2013): *"The effect of composition on the evolution of giant and intermediate-Mass Planets"* - Monthly Notices of the Royal Astronomical Society, Volume 434, Issue 4, p.3283-3292.
- **Vazan A.** & Helled R. (2012): *"On the evolution and survival of protoplanets embedded in a protoplanetary disk"* - The Astrophysical Journal, Volume 756, Issue 1, article id. 90, 11 pp.

PROCEEDINGS

- **Vazan A.** (2021): *"Interiors of water-rich planets: what do we know about them?"* - AASTCS8, Habitable Worlds 2021, id. 1039. Bulletin of the American Astronomical Society, Vol. 53, No. 3 e-id 2021n3i1039
- Desert J.M. et al. (19 authors, alphabetic) **Vazan A.** (2021): *"The nature, origin, and fate of two planets of a newborn system through the lens of their relative atmospheric properties"* - JWST Proposal. Cycle 1, ID. #2149
- **Vazan A.** (2021): *"Composition and internal structure of giant planets - an evolutionary perspective"* - 43rd COSPAR Scientific Assembly. Abstract B0.7-0005-21 (oral), id.243.
- **Vazan A.** (2021): *"How migration affects the interior structure of ice giants"* - 43rd COSPAR Scientific Assembly. Abstract B6.1-0035-21 (oral), id.522.
- Cao X., **Vazan A.**, Helled R. (2020): *"Explaining the low luminosity of Uranus: A self-consistent thermal and structural evolution"* - American Geophysical Union, Fall Meeting 2020, abstract #P074-01
- **Vazan A.** & Helled R. (2019): *"Thermal and structural evolution of Uranus"* - DPS-EPSC meeting 2019, id. EPSC-DPS2019-215.
- **Vazan A.**, Ormel C. W., Noack L., Dominik C. (2019): *"Thermal evolution of sub-Neptunes: the role of the rocky core"* - DPS-EPSC meeting 2019, id. EPSC-DPS2019-219.
- Hakim K., van den Berg A., **Vazan A.**, et al. (2019): *"Thermal evolution of rocky exoplanets with a graphite outer shell"* - DPS-EPSC meeting 2019, id. EPSC-DPS2019-927.
- Carone, L., Baeyens R., Molliere P., Barth P., **Vazan A.**, et al. (2019): *"The ultra-cold night sides of the hot and super-hot Jupiters WASP-43b and WASP-18b, arising with deep wind flow"* - DPS-EPSC meeting 2019, id. EPSC-DPS2019-562
- Helled R., **Vazan A.**, Guillot T. (2018): *"Jupiter evolution with primordial composition gradient"*. EPSC meeting 2018, id. EPSC2018-72
- **Vazan A.**, Ormel C. W., Dominik C. (2017): *"The part of the core in thermal evolution of super-Earths"*. EPSC meeting, abstract id. EPSC2017-958
- Helled R., Lozovsky M., **Vazan A.**, Stevenson D., Guillot T., Hubbard W. (2017): *"The fuzziness of Jupiter's core: linking formation and evolution models"*. EGU General Assembly, EGU2017, abstract id.11876
- **Vazan A.**, Helled R., Podolak M., Kovetz A. (2016): *"Alternative evolution and internal structure for Jupiter and Saturn"*. DPS meeting #48, abstract id.408.03
- **Vazan A.**, Helled R., Kovetz A., Podolak M. (2014): *"Composition effect on mass-radius relation of exoplanets"*. EGU General Assembly, abstract id.1353

- **Vazan A.**, Helled R., Kovetz A., Podolak M. (2014): "*Giant planet evolution: the effect of convection and mixing*". EPSC meeting, abstract Vol. 9, EPSC2014-705.
- **Vazan A.**, Kovetz A., Podolak M. (2011): "*The effect of opacity on the evolution of giant planets*" - proceedings of the IAU Symposium, Volume 276, p. 461-462

SCIENTIFIC MEETINGS AND SEMINARS

- **2022:** HP4 Workshop, Brussels, Belgium ([invited talk](#)).
- **2022:** Diversity of Rocky Planets, Lorentz Center, Leiden, Netherlands ([invited, review](#)).
- **2022:** Rocky Worlds II, Oxford, UK ([invited talk](#)).
- **2022:** Juno Prime Mission Results workshop, Caltech, CA, USA ([invited](#)).
- **2021:** Solar system workshop, Max-Planck Ringbert Castle, Germany ([invited talk](#)).
- **2021:** Astrophysics seminar, Technion, Israel ([invited seminar](#)).
- **2021:** Astrophysics seminar, University of Massachusetts, MA, USA ([invited seminar](#)).
- **2021:** Planetary science seminar, Tel Aviv University, Israel ([invited seminar](#)).
- **2021:** COSPAR 2021 scientific assembly, Sydney Australia and online ([solicited talk](#)).
- **2021:** COSPAR 2021 scientific assembly, Sydney Australia and online (talk).
- **2020:** The Uranus and Neptune Systems, AGU fall meeting online ([invited talk](#)).
- **2020:** Planet formation group seminar, MPIA, Heidelberg, Germany ([invited seminar](#)).
- **2020:** Threats from the surroundings, ESO online workshop ([invited talk](#)).
- **2020:** Exoplanet-3 Heidelberg online, planetary interior session (session chair).
- **2020:** Icy giants workshop, ISSI meeting, Bern, Switzerland ([invited talk](#)).
- **2019:** ARIEL space mission planet formation workshop, Rome, Italy (remote talk).
- **2019:** Astrophysics seminar, Technion, Israel ([invited seminar](#)).
- **2019:** EPSC-DPS meeting, Geneva, Switzerland ([solicited talk](#)).
- **2019:** EPSC-DPS meeting, Geneva, Switzerland (talk).
- **2019:** Discs2planets workshop, Max-Planck Ringbert Castle, Germany ([invited talk](#)).
- **2019:** Astrophysics seminar, University of Leicester, UK ([invited seminar](#)).
- **2019:** Planetary Sciences seminar, Weizmann Institute, Israel ([invited seminar](#)).
- **2019:** Astrophysics seminar, Ben-Gurion University, Israel ([invited seminar](#)).
- **2019:** Planet formation and evolution conference, Rostock, Germany (poster).
- **2019:** Icy giants workshop, ISSI meeting, Bern, Switzerland ([discussion leader](#)).
- **2018:** Astrophysics seminar, The Hebrew University of Jerusalem, Israel (talk).
- **2018:** Giant planet workshop, Zurich, Switzerland ([invited talk](#)).
- **2018:** Tubingen winter workshop, Tubingen University, Germany ([invited talk](#)).
- **2018:** Planetary science seminar, Tel Aviv University, Israel ([invited seminar](#)).
- **2017:** Astrophysics seminar, University of Zurich, Switzerland ([invited seminar](#)).
- **2017:** EPSC 12 meeting, Riga, Latvia (talk).
- **2017:** 'Origins of Solar Systems' – Gordon Research Conference, MA, USA (poster).
- **2017:** 'Origins of Solar Systems' – Gordon Research Seminar, MA, USA ([invited talk](#)).
- **2017:** Advanced school on exoplanetary atmosphere, Vietri sul Mare, Italy.
- **2016:** DPS 48 / EPSC 11 meeting, Pasadena, CA, US. (talk).
- **2016:** MPIA-Konkoly workshop, Budapest, Hungary ([invited talk](#)).
- **2016:** New directions in planet formation, Lorentz Center, Leiden ([invited talk](#)).
- **2016:** Netherlands Astronomy Conference 2016 (talk).
- **2016:** ARIEL (ESA M4 space mission candidate) meeting, Warsaw, Poland (talk).
- **2016:** PEPSci meeting, Hofwijck, The Netherlands (talk).
- **2016:** Planetary Sciences seminar, Weizmann Institute, Israel ([invited seminar](#)).
- **2016:** Planet formation and evolution conference, Duisburg, Germany (talk).

- **2015:** ARIEL (space mission candidate) meeting, Barcelona, Spain.
- **2015:** Exoplanets and disks meeting, Amsterdam, The Netherlands (seminar).
- **2015:** 31th Paris Astrophysics' Institute Colloquium, Paris, France (talk).
- **2014:** EPSC meeting, Cascais, Portugal (keynote talk).
- **2014:** EGU general assembly, Vienna, Austria (talk).
- **2013:** Planetary Sciences seminar, Tel Aviv University (thesis seminar).
- **2013:** 'Origins of solar systems' – Gordon Research Conference, MA, USA (poster).
- **2012:** 'Exoplanets and binaries workshop' – Tel Aviv, Israel.
- **2012:** 'Israeli Physics Society' annual meeting - Jerusalem, Israel (talk).
- **2012:** 'Planetary origins and frontiers of exploration' - Weizmann Institute, Israel.
- **2010:** 'Israeli Physics Society' annual meeting - Tel Aviv, Israel (talk).
- **2009:** 'Astrophysics of planetary systems' IAU symposium, Torino, Italy (poster).

OUTREACH ACTIVITIES

- **2022:** Search for Life talk on Israel Astronomical Association, Ramat-Gan.
- **2022:** Exoplanets talk for high school student, Atidim national project, Israel.
- **2021:** Exoplanets talk and videoclip for women day 2021, Open University of Israel.
- **2020:** Stellar evolution seminar for high school students, Hadera.
- **2019:** Exoplanets seminar for high school students, the Hebrew University.
- **2019:** 'Life outside Earth' seminar, international space week in Israel.
- **2018:** 'Astronomy on tap', public talk, Leiden.
- **2017:** 'Planet formation and evolution' talk for amateur astronomers, Amsterdam.
- **2016:** Open day 2016 activities, University of Amsterdam.
- **2015:** High school students seminar in astrophysics, Tel Aviv University.
- **2014:** 'Scientists in kindergarten' program – space and planets activities.
- **2014:** High school visit seminar on planet formation, Tel Aviv University.
- **2013:** 'Scientists Night' lecture on planet formation, Tel Aviv University.
- **2013:** 'Star formation and general astronomy' lectures in gifted children center, Olga.