

# Ekaterina ILIN

astrophysicist specializing in star-planet interactions

## Academic positions

- 2023  
→ongoing      **Postdoc @ Netherlands Institute for Radio Astronomy (ASTRON), Netherlands**  
Project STORMCHASER; PI: H. K. Vedantham
- 2022 →2023      **Postdoc @ Leibniz Institute for Astrophysics Potsdam (AIP), Germany**  
Funded by the German Aerospace Center (Deutsches Zentrum für Luft und Raumfahrt); PI: **E. Ilin**

## Education

- 2018 →2022      **PhD in Astrophysics @ Leibniz Institute for Astrophysics Potsdam (AIP), Germany**  
Supervisor: Prof. Dr. Katja Poppenhäger  
*High lights: stellar flares as probes of magnetism in stars and star-planet systems*  
*"summa cum laude"*  
  
→ I specialize in the magnetism of small stars, its origins, long-term evolution, and interaction with the planets in their orbit.
- 2016 →2018      **Master of Science in Astrophysics @ University of Potsdam, Germany**  
Supervisor: Prof. Dr. Klaus Strassmeier, mentor: Dr. Sarah J. Schmidt  
*Flares in clusters using K2 data*  
*1,0 "with distinction"*
- 2012 →2016      **Bachelor of Science in Physics @ Karlsruhe Institute for Technology, Germany**  
Specialization in biophysics, Supervisor: Prof. Dr. Ulrich Nienhaus  
*Uptake of TAT-coated gold nanoclusters in live HeLa cells*  
*1,4 "very good"*

## First author refereed publications

### 3 key publications highlighted

#### Searching for planet-induced radio signal from the young close-in planet host star HIP 67522

Ilin, E.; Bloor, S.; Callingham, J. R.; Vedantham, H. K.

2025, *Astronomy & Astrophysics*, 699, A147 doi:10.1051/0004-6361/202554684 arXiv:2507.00796

#### Close-in planet induces flares on its host star

Ilin, E.; Vedantham, H. K.; Poppenhäger, K.; Bloor, S.; Callingham, J. R.; Brandeker, A.; Chakraborty, H.

2025, *Nature*, 643, 645-648 doi:10.1038/s41586-025-09236-z arXiv:2507.00791

**Detected the first confident case of planet-induced flaring from time-domain observations with TESS and CHEOPS through Bayesian analysis of flare clustering near the innermost planet's transit.**

#### The corona of a fully convective star with a near-polar flare

Ilin, E.; Poppenhäger, K.; Stelzer, B.; Dsouza D.

2024, *Astronomy & Astrophysics*, 687/A138 doi:10.1051/0004-6361/202449541 arXiv:2405.05580

#### Planetary Perturbers: Flaring star-planet interactions in Kepler and TESS

Ilin, E.; Poppenhäger, K.; Chebly, J.; Ilić N.; Alvarado-Gómez, Julián D.

2023, *Monthly Notices of the Royal Astronomical Society*, 523/3, pp 4326-4339 doi:10.1093/mnras/stad3398 arXiv:2311.04316

#### Flaring Latitudes in Ensembles of Low Mass Stars

Ilin, E.; Angus, R.; Luger, R.; Morris, B.; Jehn, F.U.

2023, *Monthly Notices of the Royal Astronomical Society*, 523/3, pp 4326-4339 doi:10.1093/mnras/stad1690 arXiv:2306.02007

#### Searching for star-planet interactions in AU Mic TESS observations

Ilin, E.; Poppenhäger, K.

2022, *Monthly Notices of the Royal Astronomical Society*, 513/3, pp 4579-4586 doi:10.1093/mnras/stac1232 arXiv:2204.14090

### Localizing flares to understand stellar magnetic fields and space weather in exo-systems

Ilin, E.; Poppenhäger, K.; Alvarado-Gómez, J. D

2021, *Astronomische Nachrichten*, doi:10.1002/asna.202101111 arXiv:2112.09676

### Giant white-light flares on fully convective stars occur at high latitudes

Ilin, E.; Poppenhäger, K.; Schmidt, S. J.; Järvinen, S. P.; Newton, E. R.; Alvarado-Gómez, J. D; Pineda, S. J.; Davenport, J. R. A.; Oshagh, M.; Ilyin, I.

2021, *Monthly Notices of the Royal Astronomical Society*, 507/2, pp 1723–1745 doi:10.1093/mnras/stab2159 arXiv:2108.01917

First determination of near-polar flaring in four rapidly rotating M dwarfs. Developed new method for localizing flare footpoints on low mass stars using optical time-domain observations and high-resolution optical spectroscopy.

### AltaiPony – Flare science in Kepler, K2 and TESS light curves

Ilin, E.

2021, *Journal of Open Source Software*, 6(62), 2845 10.21105/joss.02845

Peer-reviewed open source python toolbox for statistical flare analysis in time-domain photometry.

Used in > 20 refereed publications (2025).

### Flares in Open Clusters with K2. II. Pleiades, Hyades, Praesepe, Ruprecht 147, and M67

Ilin, E.; Schmidt, S. J.; Poppenhäger, K.; Davenport, J. R. A.; Kristiansen, M. H.; Omohundro, M.

2021, *Astronomy & Astrophysics*, 645, A42, 25 pp. doi:10.1051/0004-6361/202039198 arXiv:2010.05576

### Flares in Open Clusters with K2. I. M45 (Pleiades), M44 (Praesepe) and M67

Ilin, E.; Schmidt, S. J.; Davenport, J. R. A.; Strassmeier, K. G.

2019, *Astronomy & Astrophysics*, 622, A133/16. doi:10.1051/0004-6361/201834400 arXiv:1812.06725

## Refereed publications with significant contribution, or as supervisor

### Searching for gamma-ray emission from stellar flares

Song Yuzhe; Paglione Timothy A. D., Ilin E.

2024, *Monthly Notices of the Royal Astronomical Society*, 531/3, 3215–3221 doi:10.1093/mnras/stae1347 arXiv:2405.15435

### Lower than expected flare temperatures for TRAPPIST-1

Maas A. J.; Ilin E.; et al.

2022, *Astronomy & Astrophysics*, 928/2, 147. doi:10.1051/0004-6361/202243869 arXiv:2210.11103

## Refereed publications with minor contributions

### Polarized, variable radio emission from the scallop-shell binary system DG CVn

Kaur, S.; ...; Ilin, E.; ...; et al.

2025, *Astronomy & Astrophysics*, TBD doi:TBD arXiv:2507.09366

### Hints of auroral and magnetospheric polarized radio emission from the scallop-shell star 2MASS J05082729-2101444

Kaur, S.; ...; Ilin, E.; ...; et al.

2024, *Astronomy & Astrophysics Letters*, 691/L17 9 pp. doi:10.1051/0004-6361/202452037 arXiv:2410.22449

### Seaweed as a resilient food solution in nuclear winter

Jehn F. U.; Jasmine Dingal, F.; Mill, A.; Ilin, E.; Harrison, C.; Roleda, M. Y. ; Denkenberger, D.

2024, *Earth's Future*, 12/1 doi:10.1029/2023EF003710

### Three young planets around the K-dwarf K2-198: high-energy environment, evaporation history, and expected future

Ketzer, L.; Poppenhaeger, K.; Baratella, M.; Ilin, E.

2024, *Monthly Notices of the Royal Astronomical Society*, 527/1, pp. 374–385 doi:10.1093/mnras/stad3197 arXiv:2311.06897

### Focus of the IPCC Assessment Reports has shifted to lower temperatures

Jehn F. U.; Kemp L.; Ilin E.; Funk C.; Wang J. R.; Breuer L.

2022, *Earth's Future*, 5/10 doi:10.1029/2022EF002876

### Simulating the Space Weather in the AU Mic System: Stellar Winds and Extreme Coronal Mass Ejections

Alvarado-Gómez, J. D; Cohen O.; Drake J. J.; Fraschetti F.; Poppenhäger, K.; Garraffo C.; Chebly J.; Ilin, E.; Harbach L.; Kochukhov O.

2022, *The Astrophysical Journal*, 928/2, 147. doi:10.3847/1538-4357/ac54b8 arXiv:2202.07949

## Teaching and supervision

total supervised: 2 Master level, 2 Bachelor level

2025	<b>Supervising BSc student @ Kapteyn Institute</b> Supervising the three-month BSc project of Andrei Danila.	Groningen, NL
2024	<b>Supervising summer student @ ASTRON</b> Supervising a 10-week summer student project with undergraduate student Necdet Canim (Pomona College, CA, USA).	Dwingeloo, NL
2024	<b>Invited lecturer at summer school @ ICE-CSIC Institute of Space Sciences</b> On the role of flares in star-planet interactions	Barcelona, Spain
2023	<b>Lecturer at summer school @ German National Scholarship Foundation</b> Teaching undergraduates about exoplanets in an interdisciplinary context	Vienna, Austria
2023	<b>Invited lecturer @ Tag der Schulastronomie Sachsen</b> Lecture about exoplanets for high school physics teachers in Saxonia.	Meißen, Germany
2022 → 2025	<b>Mentoring graduate student Cinta Vidante @ University of Potsdam ()</b> Graduated with distinction; publication in prep.	Potsdam, Germany
2020 → 2022	<b>Mentoring graduate student Aaron Maas @ University of Heidelberg</b> Maas, Ilin et al. (2022)	remote
2020	<b>Teaching assistant @ University of Potsdam</b> Galaxies and Cosmology undergraduate course	Potsdam, Germany
2016 → 2018	<b>Teaching assistant @ University of Potsdam</b> Introduction to mathematical methods in physics	Potsdam, Germany

## External funding

total ca. 270,000€

2022 → 2023	<b>PI of DLR Grant "XrayLoops"</b> Two years of postdoctoral funding, ca. 140,000€	Deutsches Zentrum für Luft- und Raumfahrt (DLR)
2021 → 2022	<b>Fulbright Scholarship @ American Museum of Natural History</b> Awarded to doctoral candidates. Includes a stipend, travel grant, and academic support throughout a six month research stay in the USA, ca. 12,000€	Fulbright Commission
2020 → 2022	<b>Doctoral Scholarship</b> Includes a stipend, travel grants, and academic support throughout the doctoral studies, ca. 55,000€	German Academic Scholarship Foundation
2012 → 2018	<b>Full Scholarship</b> Includes a stipend, travel grants, and academic support throughout the undergraduate and graduate studies, ca. 60,000€	German Academic Scholarship Foundation

## Awards and prizes

2024	<b>Stargazer Award 2024</b> 5k€ awarded to outstanding PhD theses in astronomy in German speaking countries.
2024	<b>Publication Prize @ Leibniz-Kolleg Potsdam</b> 2.5k€ awarded to outstanding PhD theses in the natural science in Berlin and Brandenburg.
2019	<b>Graduation Award @ Physikalische Gesellschaft zu Berlin, Berlin, Germany</b> 1.5k€ awarded to excellent master theses in physics earned at universities in Berlin and Potsdam.
2014	<b>Erasmus+ Scholarship @ Universitet i Oslo, Norway</b> Awarded funding for six months of undergraduate studies. Focus: space physics, computational physics

## Observing grants as Principal Investigator

2025	<b>Submillimeter Array, 10 hours DDT</b> PI: <b>E. Ilin</b> , Co-I: J. Lovell
2025	<b>CHEOPS, 270 orbits, Priority 1</b> PI: <b>E. Ilin</b>
2024	<b>VLT/UVES, 6.4 hours</b> PI: <b>E. Ilin</b> , Co-Is: H. K. Vedantham, S. Järvinen
2024	<b>Australian Telescope Compact Array, 144 hours</b> PI: <b>E. Ilin</b> , Co-Is: S. Bloor, J. Callingham
2023	<b>CHEOPS, 128 orbits, Priority 1</b> PI: <b>E. Ilin</b> , Co-Is: K. Poppenhäger
2021	<b>XMM-Newton, 36ks priority A</b> PI: <b>E. Ilin</b> , Co-Is: K. Poppenhäger, B. Stelzer

## Observing grants as Co-Investigator

2025	<b>GMRT, 32 hours</b> PI: S. Kaur, Co-Is: D. Vigano, <b>E. Ilin</b> and 14 others
2020	<b>SALT HRS, 2.8 hours DDT</b> PI: K. Poppenhäger, Co-Is: <b>E. Ilin</b> , S. J. Schmidt

## Invited talks at conferences

2025	<b>EAS Annual Meeting</b> Review: Magnetic star-planet interactions	Cork, Ireland
2024	<b>NOVA Symposium</b> Magnetic winds and plasma seas: Interactions in star-planet systems	Den Haag, NL
2023	<b>All-hands-on-deck meeting – German Exoplanet Diversity Group</b> How close-in planets manipulate their host stars	Munich, Germany
2023	<b>From the Heliosphere to Astrospheres – Lessons for Exoplanets and their Habitability</b> Magnetic star-planet interactions	Bad Honnef, Germany

## Invited colloquia and seminar talks

2025	<b>Leiden Observatory</b> Self-roast: Close-in planet induces flares on its host star	Leiden, NL
2025	<b>Anton Pannekoek Institute</b> Channeling sparks through interplanetary space: Magnetic star-planet interaction	Amsterdam, NL
2025	<b>Vienna University</b> Channeling sparks through interplanetary space: Magnetic star-planet interaction	Austria
2022	<b>University of Tübingen</b> Flares on low mass stars: from detection to characterization, and beyond	Tübingen, Germany
2022	<b>American Museum of Natural History</b> Flare observations: probing the magnetism of low-mass stars and star-planet systems	New York City, USA
2021	<b>Harvard Smithsonian Center for Astrophysics Exoplanet Pizza Lunch</b> Magnetic worlds: What flares tell us about small stars and their planets	virtual

## Contributed talks (selection)

2024	<b>CoolStars 22</b> Hot Jupiters and stellar eruptions: Planet-induced flares in young exoplanetary systems	San Diego, CA, USA
2024	<b>BCool</b> A fully convective rapid rotator with a high latitude flare and a dim corona	ASTRON, NL
2024	<b>ESA's Holland-Area Exoplanet Science Meeting</b> Hot Jupiters and stellar eruptions: planet-induced flares in young exoplanetary systems	Nordwijk, NL
2023	<b>European Astronomical Society Meeting</b> Planet-induced flares in Kepler and TESS observations	Krakow, Poland
2023	<b>The X-ray Universe</b> High-latitude flares on rapidly rotating M dwarfs - a special corona?	Athens, Greece
2019	<b>Planet-Star Connections in the Era of TESS and Gaia</b> Stellar magnetic evolution: flaring activity in K2 open clusters	Santa Barbara, CA, USA
2018	<b>Dwarf Stars and Clusters with K2</b> In search of the flaring-age relation.	Boston, MA, USA

## Training and internships

2021-2022	<b>Career Mentoring</b> Training in non-violent communication, conflict resolution, diversity awareness, and adaptive leadership.	Cusanuswerk
2019	<b>3rd Advanced School on Exoplanetary Demographics</b> Lectures on exoplanet formation, detection, demographics, star-planet interactions.	Vietri Sul Mare, Italy
2018	<b>Visiting Scientist @ NASA Ames Research Center</b> Awarded funding for an internship at the Kepler mission headquarters.	Mountain View, CA, USA

## Academic service, outreach and civic involvement (selection)

2025	<b>Podcast</b> 50-min podcast on exoplanets and the search for life for the German Bild der Wissenschaft magazine.	
2025-	<b>Workshop on star-planet interactions</b> Initiator and chair of the SOC for a 5-day workshop on star-planet interactions.	
2025	<b>LOC @ Beyond Earth (ASTRON)</b> Conference with 70 participants. Main tasks: Speaker liaison.	
2021 →ongoing	<b>Collaboration with various popular science magazines and blogs</b> PM Magazin, Newsweek, New Scientist, Leibniz Magazin, Ulrike Boehm's Women in Research blog	
2021 →ongoing	<b>Referee @ various astronomical journals</b> Astronomy & Astrophysics, AAS Journals, Astronomy and Computing, Journal for Open Source Software, Astronomische Nachrichten	
2024	<b>Weekend workshop @ Sternwarte Berlin</b> Planned a weekend long workshop on exoplanets for a small group of interested undergraduate students of all fields.	
2023	<b>Lecturer @ Vienna Summer School of the German Academic Scholarship Foundation</b> Week-long interdisciplinary summer school for 20 undergraduate scholars focused on exoplanets, and the relations between exoplanet research, ethics and culture.	
2021 →2022	<b>Student representative @ Internal Scientific Committee at AIP</b> Social events, well-being of students at the institute, on-boarding of new students.	
2021	<b>Public talks @ YouTube channel "Urknall, Weltall und das Leben"</b> 30-min YouTube video and follow-up 12-min YouTube video (in German), ≈ 40k views total.	

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***languages***     Russian, German (bilingual), English (C2), Dutch (B1)

***skills***         Python, Unix, LaTeX, Git(Hub), CASA, XMM-Newton SAS, XSPEC

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