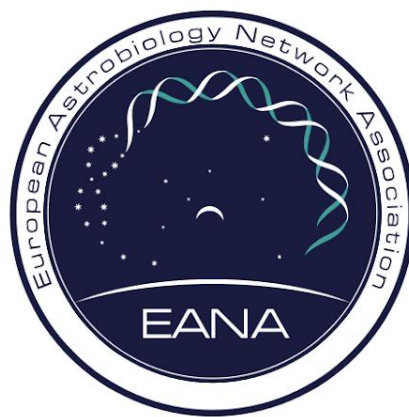


EANA

European Astrobiology Network Association



National Activity Report

AUSTRIA

2025/2026



1. Country and Contact Information

Country: AUSTRIA

National representative and institution: [Ruth-Sophie Taubner](#), Space Research Institute (IWF) of the Austrian Academy of Sciences (OeAW)

Astrobiology Institutions / Associations / Networks (linked): --

2. National overview

Austria has an interdisciplinary astrobiology community spanning from astrophysics, microbiology, to geobiology, and beyond.

At the [Space Research Institute \(IWF\)](#) of the Austrian Academy of Sciences (OeAW), the [Solar System Planetary Physics](#) group models solar/stellar influences on planetary environments, using space data and lab experiments for validation, in order to identify habitable environments as result of planetary evolution and throughout the galaxy. The [Exoplanet Weather and Climate Group](#) works on questions like how and which clouds form on these exotic worlds or how they affect the local chemical composition and the atmosphere structures. The [Exoplanet Characterisation and Evolution](#) group studies the evolution of exoplanets with focus on their mass loss and the outer atmosphere. The [Planet-Forming Disks and Astrochemistry](#) group does study the thermochemistry of planet forming environments and exploring the effect of high-energy radiation on hydrocarbon chemistry.

At the [University of Vienna](#), the [Star and Planet formation](#) group focuses on the atmospheric retention depending on different stellar masses and atmospheric compositions. The [Impact Research Group](#) performs investigations of impact cratering events in Earth history and their effects.

The [Diagnostic and Research Institute of Hygiene, Microbiology and Environmental Medicine](#) at the [Medical University of Graz](#) profiles diverse microbiomes in spacecraft assembly cleanrooms, analogue sites and onboard the ISS.

On the practical exploration front, the [Space Robotics Group](#) at [Joanneum Research](#) together with the [Vienna Research Center for Visual Computing](#) (VRVis), develops sensors and technologies for astrobiological life-detection missions on Mars. Further, the [Austrian Space Forum \(ÖWF\)](#) is performing Mars analogue missions serving as a bridge between laboratory science and field operations.

3. Research activities

3.1 Research highlights

- [Detection of Phosphorus in Io's atmosphere](#): The discovery of Ph on Io suggests that Jupiter's neighbouring icy moons may also contain this essential element for life. (IWF)



- [Detection of Deuterium in Venusian exosphere](#): Results indicate that water loss during the last 2Gyr was minimal, thereby excluding the late ocean hypothesis.
- Various studies about the K-Pg mass extinction event, e.g. [Ni isotope analysis](#) that identifies the Chicxulub impactor as a dry CO chondrite. (Univ. Vienna)
- [Green Synthesis of Macrocyclic CO₂ Conversion Catalysts](#); FWF Principal Investigator Project. This project will act as base for further investigation related to mechanochemical synthesis of Fe-Ni-sulfides similar to what was found in CV3-meteorites (2026-2029, JKU Linz)
- [Modernizing planetary protection toolkits](#); ESA OSIP project. By using state-of-the-art microbiological methods like metagenomics, combined with Machine Learning, microbial survivability and contamination risks will be assessed (2025-2028, Med Univ. Graz)

3.2 Ongoing/accepted research projects

- [EASE](#) - *Early Earth, Mars and Venus as Exoplanets*; ERC Project. The EASE project compares Earth, Venus, and Mars with exoplanets to study habitability. It combines numerical models and JWST spectra to analyse planetary atmospheres and evolutionary pathways. (2024-2029, Univ. Vienna)
- [VeReDo](#) – *Redox Disequilibrium in the Clouds of Venus – A Sign of Life?*; FWF-WEAVE joint Czech-Austrian science project. In this project, combined experiments, data analysis and model simulations are performed to test potential Redox Disequilibrium Pairs in the atmosphere of Venus. (2024-2027, IWF)
- [SuSpEx](#) – *From Surface to Space of Exoplanets*; FFG ASAP project. Investigating the connection of the surface to the diverse compositions of planetary atmospheres and their survivability. (2026-2029, Univ. Vienna)
- [HESiOD](#) – *High-energy induced sinks of N₂-dominated atmospheres* FWF-WEAVE joint Czech-Austrian science project. Modelling how high-energy events deplete nitrogen in Earth-like atmospheres, simulating long-term evolution and biosignature observability with future telescopes. (2027-2029, IWF)

3.3 Highlight publications

- H. Lammer et al.: **Earth-mass planets with He atmospheres in the habitable zone of Sun-like stars**, *Nature Astronomy*, doi.org/10.1038/s41550-025-02550-6, 2025
- L. Carone et al.: **Exoplanet climate characterization with transit asymmetries**, *Astronomy & Astrophysics*, doi.org/10.1051/0004-6361/202556695, 2026
- P. Woitke et al.: **Prediction of Sulfate Hazes in the Lower Venus Atmosphere**, *Planetary Science Journal*, 6(9), Article 225. <https://doi.org/10.3847/PSJ/ae00bf>, 2025



4. Education and Training

- [ESA Summer School Alpbach](#): annual school, 2 weeks, different topics (2025: "Small bodies in the solar system"; 2026: "High-energy processes in planetary systems") (chair: IWF)
- TU Graz: Course "[Special Topics of Technical Physics: Exoplanets and our place in the universe - an interdisciplinary approach](#)" incl. introduction to astrobiology (in summer terms)
- Univ. Innsbruck: Course "[Astrobiologie](#)" (in summer terms)
- Univ. Vienna: Course "[Planetary Habitability](#)"
- Colloquium and Seminar Series at the IWF, various talks with astrobiological relevance (e.g., [Computational Habitability](#), [Exploring Venus's atmosphere: current knowledge and future missions](#), [Earth's Atmosphere: A 4.5 Gyr Record of Our Planet's Geological Evolution](#), [Geysers, Ocean, and the Search for Life: Why ESA's L4 mission has to go to Enceladus](#), [Climates and observations of Earth-like exoplanets](#), etc.)

5. Events

- [EGU](#) General Assembly: annual geoscience meeting in Vienna, incl. astrobiological relevant sessions, e.g. in 2026: "[PS6 – Life in the Cosmos: Astrobiology and Planetary habitability](#)"
- [Charged Particle Instrumentation Workshop #1](#) (IWF); The purpose of the meeting was to present the early investigation carried out by the IWF to international partners and kick-start open discussion regarding the interest for charged particle instrumentation on a future mission to the Saturnian system (ESA's L4 mission).
- Preparations for [AMADEE-27 Mars Simulation](#) (ÖWF); e.g. Science Definition Workshop (May'26), bringing together 16 peer-review selected experiment teams from robotics, astrobiology, geosciences, and human factors.

6. Outreach

- "[Lange Nacht der Forschung](#)" (Long Night of Research) – Austrian-wide initiative (bi-annual, last: May 2026)
- [Graz in Space](#): bi-annual public lecture series organized by the IWF. [2025](#): 50 years of ESA & ESA Summer School Alpbach (IWF)
- [EXO:Aliens](#): regular shows at the Planetarium Vienna
- [Earth 2.0? Maybe Not: Intelligent Life Might Be Far Rarer Than We Think](#); SETI Live discussion (Dec 2025, IWF)
- [Project ArcReactor](#) at Ars Electronica Center (Linz); cultivation of microorganisms in a display bioreactor on Moon, Mars, and asteroid analogue materials.
- Lectures at Urania Steiermark (e.g., "[Planeten und Monde im Sonnensystem – Ist Leben möglich?](#)"; IWF)
- Lectures at Urania Wien (e.g., "[Ein mikrobieller Reiseführer durch](#)



- [die Galaxis](#)"; Med. Univ. Graz)
- Kinderuni Wien – talk "[Sind wir allein im Sonnensystem?](#)" (IWF)
- "[Akademie im Klassenzimmer](#)" – talks/workshops at Austrian high-schools, e.g. "[Astrobiologie – Die Suche nach Leben im Weltraum](#)" (IWF)
- Workshop for children: "[Astrobiologie - die Suche nach Leben im Kosmos](#)", Sept 2026 (ÖWF)

7. Infrastructure

- The IWF's [Astrolab](#) studies the physical properties of planetary analogue materials through vacuum experiments and modelling to understand extraterrestrial surfaces and support future space missions like JUICE and Comet Interceptor.
- The ÖWF is now operating the [ESA Vertical Treadmill Facility](#), an ESA Ground Based Facility to investigate human factors under various gravity levels. First research projects were conducted already studying human physiological workload effects under reduced gravity in cooperation with the Medical University of Vienna and Medical University of Graz.
- In order to emulate biomarker signatures in Raman spectroscopy, in cooperation with students from the ESTACA engineering college in France, the ÖWF is developing a [Raman spectrometer to acquire synthetic spectra](#) for field simulations and training purposes. This instrument simulates data acquisition, signal time delay, and other operational border conditions for operating a Raman spectrometer on the Martian surface.

8. Milestones

- Simon Schleich, **PhD thesis**, Univ. Vienna, July 2026. [Challenging atmospheric retrievals – Towards robust inference from exoplanet transmission spectra with next-generation telescopes](#).
- Ronja Vetter, **BSc-thesis**, Univ. Innsbruck/ÖWF, Feb 2026. [Developing a synthetic Raman spectral library for Mars analog Missions](#).