Johan L. Freiherr von Forstner

Curriculum vitae

Education

ongoing **Ph.D. in Space Physics**, *University of Kiel*, Germany.
Thesis subject: "Propagation of ICMEs in the inner Heliosphere — Observations using Forbush decreases". Estimated graduation: End of 2020, at the age of 22.

2018 **M.Sc. in Physics**, *University of Kiel*, Germany, final mark: 1.4 (very good).
Additional computer science course:
- Advanced Programming Concepts (Functional and logic programming)

Thesis subject: "Tracking and validating ICMEs propagating towards Mars using STEREO Heliospheric Imagers combined with Forbush decreases detected by MSL/RAD"

2016 **B.Sc. in Physics**, *University of Kiel*, Germany, final mark: 1.7 (good).
I started my university studies in 2013 as one of the youngest students in Germany (age 15).
Additional computer science courses:
- Computer science basics (Ruby programming, algorithms and data structures)
- Programming practical course (Java)

Thesis subject: "Multi-spacecraft observations of ICMEs propagating from 1 AU to 1.5 AU during the 2014 Earth-Mars conjunction"

Experience

2018–present **Postgraduate Researcher / PhD Student in Space Physics**, *University of Kiel*, Germany.
- Part of the scientific team of the Radiation Assessment Detector (RAD) instrument on NASA's Mars Science Laboratory mission (Curiosity rover), developed together with Southwest Research Institute, Boulder, Colorado, mainly working on data analysis and instrument simulation.
- Research focusing on:
  - The radiation environment on Mars
  - Space weather: Heliospheric propagation of solar eruptions
  - Influence of solar eruptions on cosmic radiation
- I integrated Mars observations into the framework of space weather forecasting for the first time, which is crucial for the safety of astronauts on future human space missions, e.g. to Mars. My results were published in 3 first-author articles in peer reviewed journals.
- Since 2020: Lead instrument scientist for the High Energy Telescope, part of the Energetic Particle Detector (EPD) suite on ESA's Solar Orbiter mission.
- Presentations at international scientific conferences, including the American Geophysical Union Fall Meeting (since 2017: New Orleans, Washington DC, San Francisco), and a plasma physics summer school at École de Physique des Houches, France (2019)
- I developed Python data analysis software for MSL/RAD and SolO/EPD as well as other missions, such as Lunar Neutrons and Dosimetry (LND) on the Chinese Chang'E 4 lunar mission, and made useful contributions to scientific open source libraries, such as pandas and SpiceyPy.
- Teaching experience:
  - Physics lab course: supervising bachelor students when conducting physics experiments, including oral exams
  - Lectures for master students: Unit testing with Python, Git version control

Feb 26, 1998 • *German* • *Bülowstr. 19, 24105 Kiel, Germany*
johan.forstner@gmail.com • *http://www.ieap.uni-kiel.de/et/people/forstner/*
johan_vf • *johan12345* •

2014–present **Software Developer**, *rami.io Software Development*, Heidelberg, Germany (part-time).

- Project lead & full stack developer for **Vertretungsplan.app**, an Android/iOS app for high school students and teachers to be notified about schedule changes. I built the app including backend from scratch, and implemented support for over 300 schools, resulting in more than 60,000 active users.
- Android developer for **Web Opac App** (https://opac.app), which allows to conveniently access user account and catalog search in more than 1,000 public libraries wordwide. I completely overhauled the app design improving the support for tablets, developed interfaces for various additional library systems, e.g. the software used by Vienna City Library (Austria), and adapted the app frontend to customer requirements.
- Frontend and backend work on Python/Django-based web applications, including **pretix** (https://pretix.eu), an open source ticketing system, as well as company-internal tools.

2016–2018 **Student research assistant in Space Physics**, *University of Kiel*, Germany.

Personal software projects

EVMap Open source Android app to find electric vehicle charging stations. Implemented in Kotlin. https://github.com/johan12345/EVMap

Skills

Languages Fluent in English and German, basic knowledge of French

Programming Java, Python, Kotlin, Swift, JavaScript

Frameworks Android, iOS, Django, Vue.js

Databases SQL, MongoDB

Extracurriculars

Nobel Meeting Selected as a participant for the Lindau Nobel Laureate Meeting #LINO70 (Germany, 2020)

Music 3rd prize in the 2018 German federal youth music competition, category "piano four hands", long-time member of Kiel University Choir

Sailing Active member of a local dinghy sailing club

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