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MAX PLANCK INSTITUTE
FOR SOLAR SYSTEM RESEARCH

EDUCATION

Degree	Institution	Year	Score
PhD in Physics	Max Planck Institute for Solar System Research (MPS) and University of Göttingen (Uni Gö) Thesis title: "Towards solar many-line inversions"	2021-2025	MCL
Diploma in Mathematics	University of Duisburg-Essen (UDE) Thesis title: "Nash-Aufblasungen torischer Varietäten"	2006-2015	1.6*

* Range from 1.0 (best) to 5.0 (fail) and 4.0 being the lowest passing grade

WORK EXPERIENCE

Company	Work Title / Task	Year
Max Planck Institute for Solar System Research	Post-Doc (wrap-up)	2025-2026
Hochschule für Angewandte Wissenschaft und Kunst (HAWK), Göttingen	Research Associate	2020-2021
SCISYS Deutschland GmbH, Bochum	Technical Project Lead & Software Development <i>Example projects: Galileo Navigation System (EU), ARTS (ESA), EUSST (DLR)</i>	2015-2020

Research Interests

I am interested in enhancing the understanding of physics in the lower solar atmosphere, particularly the smallest scale magnetic fields and flows. Suitable observational data is currently still very rare and I am hence not only involved in the data analysis and interpretation but also in the creation and improvements of numerical tools (such as data reduction, image reconstruction, and inversion approaches) and instruments.

Technical Skills

- Software architecture
- SQL database scheme development
- Software development (Python, Java, Ruby, C#, JavaScript)
- Software verification, validation, and end-to-end software test automation
- Project management (team mediation, issue management, and requirements management)
- Agile development methodologies (SCRUMM, KANBAN)
- Project documentation (ECSS-E-ST-40C – Software)
- Code quality and versioning management

Teaching

Institution	Topic	Task	Semester
IMPRS, Uni Gö	Clean Code for (Astro-)Physicists	Conception, Lecturing	WiSe 22/23, WiSe 23/24
Uni Gö	Lab course: CCD Calibration	Conception, Tutoring	SuSe 23, WiSe 23/24
HAWK	Co-Supervision of two master-projects		SuSe 21
UDE	Analysis für Lehramtsstudiengänge	Tutoring	WiSe 11/12, WiSe 13/14
UDE	Modellieren für Lehramtsstudiengänge	Tutoring	SuSe 12, Suse 14

Selected refereed publications

For consistency reasons I am publishing under my birth name "Hölken".

- **J. Hölken**, D. Przybylski, M. van Noort, D. Cameron, S. K. Solanki, H.P. Doerr, W. Cao, N. Gorceix, J. Kang, K. Ahn, and J. Chae: "On the magneto-convective nature of dark striations and moving bright grains at the edge of pores", 2026, A&A, 708, A135 ([doi: 10.1051/0004-6361/202659037](https://doi.org/10.1051/0004-6361/202659037))
- **J. Hölken**, M. van Noort, S. K. Solanki, A. Feller, H.P. Doerr, W. Cao, N. Gorceix, J. Kang, K. Ahn, and J. Chae: "Towards solar many line inversion of high resolution spectro-polarimetric data", 2026, A&A, 705, A220 ([doi: 10.1051/0004-6361/202556890](https://doi.org/10.1051/0004-6361/202556890))
- M. van Noort, **J. Hölken**, H.P. Doerr, W. Cao, N. Gorceix, J. Kang, K. Ahn, J. Chae and S. K. Solanki: "Large aperture diffraction limited spectro-polarimetry with FISS-SP", 2025, A&A, 704, A215 ([doi: 10.1051/0004-6361/202556041](https://doi.org/10.1051/0004-6361/202556041))
- A. Feller, A. Gandorfer, B. Grauf, F. A. Iglesias, T. L. Riethmüller, A. Korpi-Lagg, **J. Hölken** (and many more): "The Sunrise Ultraviolet Spectropolarimeter and Imager: Instrument description", Solar Physics, 2025, 300(5) ([doi: 10.1007/s11207-025-02471-7](https://doi.org/10.1007/s11207-025-02471-7))
- A. Korpi-Lagg et al.: "Sunrise III: Overview of Observatory and Instruments", Solar Physics, 2025, 300(5) ([doi: 10.1007/s11207-025-02485-1](https://doi.org/10.1007/s11207-025-02485-1))
- **J. Hölken**, H.P. Doerr, A. Feller, F.A. Iglesias: "Spectroflat: A generic spectrum and flat-field calibration library for spectro-polarimetric data", 2024, A&A, 687, A22 ([doi: 10.1051/0004-6361/202348877](https://doi.org/10.1051/0004-6361/202348877))

Conference Contributions

- "Exploring spatially highly resolved Stokes profiles from Sunrise-III/SUSI" (Talk, 1st open Sunrise-III Meeting, 2026)
- "Exploring spatially highly resolved spectropolarimetric scans" (**Solicited talk**, USO golden jubilee conference, 2026)
- "Deciphering pore-boundary small-scale structures with GST/FISS-SP" (Talk, 7th GST workshop, 2026)
- "Towards solar many-line inversions" (Talk, 7th GST workshop, 2026)
- "Beating the noise with solar many-line inversions" (Talk, SPW11, 2025)
- "Solar many-line inversions of diffraction limited spectro-polarimetric data" (Talk, Hinode-18/IRIS-16, 2025)
- "First steps towards solar many-line inversions" (Talk, DPG SMuK Spring Meeting, 2025)
- "Diffraction limited spectro-plarimetry with GST/FISS-SP" (Poster, ESPM-17, 2024)
- "Spectroflat: Validation of the new spectral calibration library" (Poster, ESPM-17, 2024)
- "Spectroflat: A new spectrum and flat-field calibration library" (Poster, Hinode-16/IRIS-13, 2023)
- LOC support for the "Conference on Algebraic Geometry and Arithmetic" 2010, Essen, Germany

Observation and Instrumentation Campaigns

- **SST/CRISP+CHROMIS** (2026-07-08 to 2026-07-08): On site at the Swedish Solar Telescope (SST), La Palma
- **SST/MiHI 2025** (2025-10-24 to 2025-10-31): On site at the Swedish Solar Telescope (SST), La Palma
- **Sunrise-III/SUSI 2024** (2024-04-03 to 2024-07-10): Remotely from Göttingen Operation Center (GOC), Göttingen
- **GREGOR & SoI 2023b** (2023-10-12 to 2023-10-26): Remotely from MPS, Göttingen
- **GST/FISS-SP 2023a** (2023-04-28 to 2023-05-21): On site at Big Bear Solar Observatory (BBSO), Big Bear City
- **GST/FISS-SP 2022b** (2022-09-13 to 2022-10-13): On site at Big Bear Solar Observatory (BBSO), Big Bear City
- **Sunrise-III/SUSI 2022** (2022-05-01 to 2022-07-20): On site at ESRANGE, Kiruna

Funding, Proposals, and Awards

- Two weeks exclusive GST telescope time for FISS-SP instrumentation & observation in July 2025 [Co-I]
- 470 EUR conference fee support for Hinode-18/IRIS-16

Languages

German (native), English (C1), French (A2)

Levels as of common European Framework of Reference for Languages: A1/2 Basic user, B 1/2 Independent user, C 1/2 Proficient user

Volunteering

I am member of the "Amateurastronomische Vereinigung Göttingen e.V." (AVG) whose purpose it is to maintain the historic Göttingen Hainberg-Observatory and open it to the public. Here, I am especially involved in the improvement, maintenance, and operation of the instrumentation of the historic solar tower (Coelostat, slit-spectrograph, white-light and h-alpha observations) as well as the general maintenance of the observatory.

I am developing and maintaining two python-based open-source data calibration libraries for solar spectrographs: `spectroflat` and `atlas-fit` (see, [Hölken et al., 2024](#)). `spectroflat` is an associated SunPy package.

Outreach

- Regular: Institute guided tours (clean rooms, workshops, labs and science), MPS
- Regular: Guided tours and public observations at the Göttingen Hainberg-Observatory (historic solar tower and nighttime telescopes), AVG
- Regular: Public outreach talks on diverse solar, physics and space-science topics, AVG
- Public outreach talks at Institut für Astro & Geophysik Göttingen (IAG)
- Participation in special irregular outreach events as the "Night of Science", "75 years Max Planck Society", "Astronomietag", "Solar Eclipse observation", etc., MPS