

FRANZISKA ZEUNER

Curriculum Vitae

Personal Details

Date of birth 17/02/1989
Place of birth Bielefeld, Germany
Nationality German

Research Experience

Since 08/2024 SNF-funded **PI** (including salary) for the project **En Route to 3D Hanle Diagnostics: The observational perspective** at IRSOL

01/2023 - 03/2024 Postdoctoral researcher at IRSOL working in the SNF funded project **Astrophysical Spectropolarimetry**, characterizing and improving instrumentation for ground-based solar telescopes, conducting observations with subsequent data analysis and -management

12/2019 - 12/2022 Postdoctoral researcher at IRSOL working as **PI in the European SOLAR-NET Horizon2020 project "Absolute high-precision solar polarimetry"**, developing innovative observational techniques in combination with new instrumentation

05/2016 - 11/2019 Selected **PhD candidate** of the International Max Planck Research School for Solar System Science in the group "Solar Lower Atmosphere and Magnetism" at the Max Planck Institute for Solar System Research, focusing on ground-based solar spectropolarimetry

10/2014 - 12/2015 Scientific **research assistant** in the working group "Ultra-fast Nanophotonics" at the University of Paderborn with the key aspect of measuring the optical nonlinear response of meta-surfaces

Advanced Education

08/2020 **Doctor rerum naturalium, magna cum laude**
Title of doctoral thesis *High resolution scattering spectropolarimetry of the quiet solar photosphere*
Supervisors Prof. Dr. Sami K. Solanki, Prof. Dr. Ansgar Reiners, Dr. Alex Feller, Dr. Michiel van Noort
University of Göttingen, Germany

10/2014 **Master of Science, mark: 1.1 (passed with distinction)**
Title of master thesis *Coherent control of localized plasmonic excitations via optical nearfield coupling, awarded with the excellent theses prize* in natural sciences of the University of Paderborn 2014
Supervisor Prof. Dr. Thomas Zentgraf
University of Paderborn, Germany

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01/2013 **Bachelor of Science, mark: 1.6**

Title of bachelor thesis *Realisation and characterisation of an actively stabilized Michelson-interferometer for coherent control of NIR-fs-pulses*

Supervisor Prof. Dr. Thomas Zentgraf
University of Paderborn, Germany

Publications

- Paper S. Esteban Pozuelo, A. Asensio Ramos, J. Trujillo Bueno, R. Ramelli, **F. Zeuner**, and M. Bianda: Study of an active region prominence using spectropolarimetric data in the He I D₃ multiplet - *Astronomy & Astrophysics*, 696, A109 (2025)
- Paper H. Li, T. del Pino Alemán, J. Trujillo Bueno, and **F. Zeuner**: Observation and Modeling of the circular polarization of the Cr I magnetic field induced transition at 533.03 nm - *The Astrophysical Journal*, 964, 155 (2024)
- Paper **F. Zeuner**, T. del Pino Alemán, J. Trujillo Bueno, and S. K. Solanki: Comparing Observed with Simulated Solar-disk-center Scattering Polarization in the Sr I 4607.3 Å line - *The Astrophysical Journal*, 964, 10 (2024)
- Conference Paper **F. Zeuner**, D. Gisler, M. Bianda, R. Ramelli, and S. V. Berdyugina: Enhancing the accuracy of solar polarimetry by coalescing slow and fast modulation: method description and first performance tests - *Ground-based and Airborne Instrumentation for Astronomy IX (SPIE)*, 121840T (2022)
- Paper Quintero Noda, C., and 274 co-authors: The European Solar Telescope - *Astronomy & Astrophysics*, 666, A21 (2022)
- Paper **F. Zeuner**, L. Belluzzi, N. Guerreiro, R. Ramelli, and M. Bianda: Hanle rotation signatures in Sr I 4607.3 Å - *Astronomy & Astrophysics*, 662, A46 (2022)
- Paper **F. Zeuner**, R. Manso Sainz, A. Feller, M. van Noort, S. K. Solanki, F. A. Iglesias, K. Reardon, and V. Martínez Pillet: Solar disk center shows scattering polarization in the Sr I 4607.3 Å line - *The Astrophysical Journal Letters*, 893, L44 (2020)
- Paper **F. Zeuner**, A. Feller, F. A. Iglesias, and S. K. Solanki: Detection of spatially structured scattering polarization of Sr I 4607.3 Å with the Fast Solar Polarimeter - *Astronomy & Astrophysics*, 619, A179 (2018)
- Paper W. Ye, **F. Zeuner**, X. Li, B. Reineke, S. He, C.-W. Qiu, J. Liu, Y. Wang, S. Zhang, and T. Zentgraf: Spin and wavelength multiplexed nonlinear metasurface holography - *Nature Communications* 7, 11930 (2016)
- Paper S. Chen, **F. Zeuner**, M. Weismann, B. Reineke, G. Li, V. K. Valev, K. W. Cheah, N. C. Panoiu, T. Zentgraf, and S. Zhang: Giant Nonlinear Optical Activity of Achiral Origin in Planar Metasurfaces with Quadratic and Cubic Nonlinearities - *Advanced Materials* 28, 15,2992-2999 (2016)
- Paper **F. Zeuner**, M. Muldarisnur, A. Hildebrandt, J. Förstner, and T. Zentgraf: Coupling mediated coherent control of localized plasmon polaritons - *Nano Letters* 15, 4189 (2015)

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- Paper C. A. Bader, **F. Zeuner**, M. H. W. Bader, T. Zentgraf, and C. Meier : Non-linear optical sub-bandgap excitation of ZnO-based photonic resonators - *Journal of Applied Physics* 118, 213105 (2015)
- Paper S. Chen, G. Li, **F. Zeuner**, W. H. Wong, E. Yue Bun Pun, T. Zentgraf, K. W. Cheah, and S. Zhang: Symmetry selective third harmonic generation from plasmonic metacrystals - *Physical Review Letters* 113, 033901 (2014)

Selected recent Conference contributions and Talks

- Invited seminar talk **F. Zeuner**: Measuring the Hanle modified scattering polarization in the solar photosphere - *Lagrange Seminar, L'Observatoire de la Côte d'Azur, Nice, France* (2025)
- Invited seminar talk **F. Zeuner** et al.: The GREGOR Slow Polarization Modulator - *Solar physics group seminar, IAC, La Laguna, Spain* (2023)
- Invited keynote talk **F. Zeuner**: Hanle rotation finally revealed in Sr I 4607 Å - *Solar Polarization Workshop 10, Kyoto, Japan* (2022)
- Invited MERAC talk **F. Zeuner**: High-precision spectro-polarimetric measurements with enhanced accuracy for probing the unresolved solar photospheric magnetic field - *Swiss Society for Astronomy and Astrophysics GA, Bern, Switzerland* (2022)
- Invited seminar talk **F. Zeuner** et al.: How a "simple" spectral line continues to challenge paradigms in solar physics - *Solar physics group seminar, IAC, La Laguna, Spain* (2021)
- Invited talk **F. Zeuner** et al.: Scattering polarization measurements with FSP and FSP II - *NSO Seminar, DKIST Science Workshop, Boulder, USA* (2018)

Grants and accepted observing proposals

- Observation **THEMIS**, 2025, PI of proposal *Observational determination of the formation height of the Ti 4536 Å line*, accepted in cycle 2025A.
- Fund **Observatoire de la Côte d'Azur**, one month research stay *Small-scale magnetism with THEMIS data*, 2025, (3'200 Euro).
- Observation **GREGOR**, 2024, Co-I of proposal *ZIMPOL@GREGOR: Observing scattering polarization with high resolution, high-precision and enhanced accuracy* (Battaglia et al.), accepted in cycle 2024B.
- Grant **SNSF Ambizione**, 2023, PI of the project *En route to 3D Hanle diagnostics in stellar atmospheres: the observational perspective* (478'000 CHF).
- Observation **GREGOR**, 2023, proposal *ZIMPOL@GREGOR: Observing scattering polarization with high resolution, high-precision and enhanced accuracy* (Zeuner et al.), accepted in cycle 2023B.
- Observation **DKIST**, 2023, PI in the proposal *Spatio-temporally resolved linear scattering polarization in the Sr I line at 4607 Å: a window to the small-scale photospheric magnetism* accepted in cycle 2.
- Observation **DKIST**, 2023, Co-I in the proposal *Probing the Photospheric Conditions for Spectral Line Scattering in Sr 4607* (PI: I. Milic) accepted in cycle 2.

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- Fund **SOLARNET Mobility**, 2023, funded two month project *Interpreting spatially resolved scattering polarization measurements with high-precision and enhanced accuracy for probing the solar photospheric magnetic field* at the Institute for Astrophysics of the Canary Islands/Spain (2'000 CHF).
- Support **Kyoto University**, 2022, 1'900 CHF **Traveling Support**
- Observation **GREGOR**, 2022, proposal *ZIMPOL@GREGOR: Observing scattering polarization with high resolution, high-precision and enhanced accuracy* (Zeuner et al.), accepted in cycle 2022B.
- Award **Swiss Society for Astronomy and Astrophysics**, 2022, 2'430 CHF **MERAC Travel Award**
- Support **Swiss Society for Astronomy and Astrophysics**, 2021, 1'580 CHF **Young Scientist Support**
- Observation **DKIST**, 2021, Co-I in the proposal *Are chromospheric swirls torsional Alfvén waves?* (PI: A. Battaglia) Science Merit Group B in Cycle 1.
- Observation **National Solar Observatory**, 2017, 2 weeks stay at the Dunn Solar Telescope, New Mexico, USA

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