Timo Reinhold

Dr., Dipl. Phys.

** 21 Sep 1983, Bremerhaven*
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Curriculum Vitae

Academic career

since Oct 2018 — **Postdoc**, *Max Planck Institute for Solar System Research (MPS), Göttingen*, Supervisor: Dr. Alexander Shapiro.

Oct 2016 – Sep 2018 — **Postdoc**, *Max Planck Institute for Solar System Research (MPS), Göttingen*, Supervisor: Dr. Saskia Hekker.

Sep 2013 – Sep 2016 — **Postdoc**, *Institute for Astrophysics, Georg-August-Universität Göttingen*, Supervisor: Prof. Dr. Laurent Gizon.

Jun 2010 – Aug 2013 — **PhD**, *Institute for Astrophysics, Georg-August-Universität Göttingen*, *Grade:* magna cum laude, Supervisor: Prof. Dr. Ansgar Reiners.

Oct 2003 – Jun 2009 — **Physics diploma studies**, *Georg-August-Universität Göttingen*, *Grade:* 1.5, Supervisor: Prof. Dr. Peter Müller.

Jun 2003 — **Abitur**, *Carl von Ossietzky Gymnasium, Bremerhaven*, *Grade:* 1.3.

Selected Publications

T. Reinhold, A. I. Shapiro, S. K. Solanki, and G. Basri. New rotation period measurements of 67 163 Kepler stars. *A&A*, 678:A24, October 2023. doi: 10.1051/0004-6361/202346789.

V. Vasilyev, **T. Reinhold**, A. I. Shapiro, N. A. Krivova, I. Usoskin, B. T. Montet, S. K. Solanki, and L. Gizon. Superflares on solar-like stars. A new method for identifying the true flare sources in photometric surveys. *A&A*, 668:A167, December 2022. doi: 10.1051/0004-6361/202244422.

T. Reinhold, A. I. Shapiro, S. K. Solanki, and G. Basri. Measuring Periods in Aperiodic Light Curves-Applying the GPS Method to Infer the Rotation Periods of Solar-like Stars. *ApJ*, 938(1):L1, October 2022. doi: 10.3847/2041-8213/ac937a.

T. Reinhold, A. I. Shapiro, V. Witzke, N.-E. Nèmec, E. Işık, and S. K. Solanki. Where Have All the Solar-like Stars Gone? Rotation Period Detectability at Various Inclinations and Metallicities. *ApJ*, 908(2):L21, February 2021. doi: 10.3847/2041-8213/abde46.

E. M. Amazo-Gómez, A. I. Shapiro, S. K. Solanki, G. Kopp, M. Oshagh, **T. Reinhold**, and A. Reiners. Inflection point in the power spectrum of stellar brightness variations. III. Facular

versus spot dominance on stars with known rotation periods. *A&A*, 642:A225, October 2020a. doi: 10.1051/0004-6361/202038926.

T. Reinhold, A. I. Shapiro, S. K. Solanki, B. T. Montet, N. A. Krivova, R. H. Cameron, and E. M. Amazo-Gómez. The Sun is less active than other solar-like stars. *Science*, 368(6490): 518–521, May 2020. doi: 10.1126/science.aay3821.

E. M. Amazo-Gómez, A. I. Shapiro, S. K. Solanki, N. A. Krivova, G. Kopp, **T. Reinhold**, M. Oshagh, and A. Reiners. Inflection point in the power spectrum of stellar brightness variations. II. The Sun. *A&A*, 636:A69, April 2020b. doi: 10.1051/0004-6361/201936925.

T. Reinhold and S. Hekker. Stellar rotation periods from K2 Campaigns 0-18. Evidence for rotation period bimodality and simultaneous variability decrease. *A&A*, 635:A43, March 2020. doi: 10.1051/0004-6361/201936887.

V. Witzke, **T. Reinhold**, A. I. Shapiro, N. A. Krivova, and S. K. Solanki. Effect of metallicity on the detectability of rotational periods in solar-like stars. *A&A*, 634:L9, February 2020. doi: 10.1051/0004-6361/201936608.

T. Reinhold, K. J. Bell, J. Kuszlewicz, S. Hekker, and A. I. Shapiro. Transition from spot to faculae domination. An alternate explanation for the dearth of intermediate Kepler rotation periods. *A&A*, 621:A21, January 2019. doi: 10.1051/0004-6361/201833754.

T. Reinhold and L. Gizon. Rotation, differential rotation, and gyrochronology of active Kepler stars. *A&A*, 583:A65, November 2015. doi: 10.1051/0004-6361/201526216.

S. Aigrain, J. Llama, T. Ceillier, M. L. d. Chagas, J. R. A. Davenport, R. A. García, K. L. Hay, A. F. Lanza, A. McQuillan, T. Mazeh, J. R. de Medeiros, M. B. Nielsen, and **T. Reinhold**. Testing the recovery of stellar rotation signals from Kepler light curves using a blind hare-and-hounds exercise. *MNRAS*, 450:3211–3226, July 2015. doi: 10.1093/mnras/stv853.

T. Reinhold, A. Reiners, and G. Basri. Rotation and differential rotation of active Kepler stars. *A&A*, 560:A4, December 2013. doi: 10.1051/0004-6361/201321970.

Selected Conferences

Jul 2022	*Cool Stars 21*, online, Poster
Apr 2021	*9th BCool meeting*, online, Talk
Sep 2019	*Thinkshop 16 – The rotation periods of cool stars: Measurements, uses, connections and prospects*, Potsdam, Talk
Feb 2019	*ISSI Team 446 – Linking solar and stellar variabilities*, Bern, Talk
Jul 2018	*Cool Stars 20*, Boston, Talk
Jun 2017	*Thinkshop 14 – Stellar Magnetism: Challenges, Connections, and Prospects*, Potsdam, Talk
Jun 2015	*NASA Workshop on Solar Dynamo Frontiers*, Boulder (Colorado), Talk
Jul 2014	*The Space Photometry Revolution – CoRoT-3/KASC-7 joint meeting*, Toulouse, Poster

Apr 2013	*Differential Rotation and Magnetism across the HR Diagram*, Stockholm, Talk
Jun 2012	*Cool Stars 17*, Barcelona, Talk
Aug 2010	*Cool Stars 16*, Seattle, Poster

PhD Thesis

Title	*Photometric variability in the Kepler field*
Supervisor	Prof. Dr. Ansgar Reiners
Context	The Kepler space telescope monitored more than 150,000 stars with unprecedented precision providing the opportunity to search for rotation-induced variability. The main focus of the thesis lies on the detection of surface differential rotation. I developed a method to detect rotation and differential rotation from photometric data for a vast number of stars. Rotation periods were measured for more than 24,000 Kepler stars in good agreement with previous studies. The differential rotation measurements, however, draw a completely new picture of the surface shear and its scaling with temperature and rotation. The results are in close agreement with theoretical predictions.

Diploma Thesis

Title	On the integrated density of states of the Laplace operator on bond-percolation graphs of the Bethe lattice
Supervisor	Prof. Dr. Peter Müller
Context	Modeling a disordered solid body can be realized by a percolation process. We use the Bethe lattice to define random Laplace operators. The integrated density of states can be defined on these operators telling us the distribution of possible energy levels of the system.

Languages

German	Native speaker
English	Fluent
French	Basic communication skills

Computer skills

Programming	IDL, Python
Writing	LaTeX, Office, Excel

Interests

Foosball, politics, movies