Curriculum Vitae

Dr. Hannah Schunker
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- **CONFERRAL OF ACADEMIC DEGREES & CERTIFICATES**

22.03.2007 Doctor of Philosophy (Astrophysics): Monash University, Australia
2002 Bachelor of Science (First class Honours A, Physics): Adelaide University, Australia
2001 Bachelor of Science, (double major in Experimental Physics and Theoretical Physics)
Adelaide University, Australia
1997 South Australian Certificate of Education (SACE), Tertiary Entrance Ranking 95.6% Siena College, Australia

- **CURRENT POSITION**

2019- Staff Scientist (tenured), Department “Solar and Stellar Interiors”, Max Planck Institute for Solar System Research, Germany
2012-2019 Project Scientist (non-tenured), Department “Solar and Stellar Interiors”, Max Planck Institute for Solar System Research, Germany
2006-2012 Post-doctoral Research Fellow, Department “Solar and Stellar Interiors”, Max Planck Institute for Solar System Research, Germany

- **PREVIOUS POSITIONS**

2003-2007 Postgraduate studies for Doctor of Philosophy (Astrophysics): Monash University, Australia
2002 Postgraduate studies for Honours degree, Adelaide University
1998-2001 Undergraduate studies for Bachelor of Science, Adelaide University

- **OTHER SCIENTIFIC ROLES**

2016- Work Package Leader, European Space Agency’s (ESA) Planetary Transits and Oscillations of Stars (PLATO) Data Centre
2012-2016 Co-PI project A18 “Asteroseismology and dynamos in solar-like stars” Collaborative Research Centre 963
2010- Project Planning, PLATO, Project Office (MPS)
2009-2016 Lead IT Specialist, German Data Centre for the Solar Dynamics Observatory (DLR project)
2006-2009 Data and code management, Local Helioseismology Network Activity, European Helio- and Asteroseismology Network (HELAS, FP6; MPS)

- **PROFESSIONAL MEMBERSHIPS**

2015- International Astronomical Union member, Division E Sun and Heliosphere, Division G Stars and Stellar Physics

- **INVITED ORAL PRESENTATIONS**

  My research has an impact on, and is broadly relevant to, the astrophysics research community demonstrated by the fact I have been invited to give many presentations at international conferences. This also illustrates my ability to communicate complex ideas clearly and effectively.

2018 Invited colloquia, “Solving the Solar Dynamo Problem”, Georgia State University, 4 March, Atlanta, USA

2017 Invited colloquia, “Solving the Solar Dynamo Problem”, University of Hawaii, 9 March, Hawaii, USA

2016 Invited colloquia, “Solving the Solar Dynamo Problem”, University of Birmingham, 28 April, Birmingham, UK

2015 “Advances in the Seismology of the Sun and Stars”, conference, 7-11 Dec, Mumbai, India.

2015 IAU, FM17 “Advances in Stellar Physics from Asteroseismology”, 3-15 August, Honolulu, USA.

2015 “Sunspot formation: theory, simulations and observations”, 9-13 March 2015, Stockholm, Sweden.

2013 NSO Workshop #27 “Fifty years of seismology of the Sun and Stars”, May 7-10, Tucson, USA.

2012 GONG 2012 / LWS / SDO5 / SOHO 27 “Eclipse on the Coral Sea: cycle 24 ascending”, 12-16 November, Palm Cove, Australia.

2012 Bcool, second workshop, “Cool magnetic stars”, 15-19 October, Göttingen, Germany.

2012 Opening Symposium CRC 963 “Astrophysical Flow Instabilities and Turbulence”, 9-10 February, Göttingen, Germany.

2011 LWS/SDO 3 “Solar Dynamics and Magnetism from the Interior to the Atmosphere”, Oct 31 – Nov 4, Stanford, USA.

2010 Fourth HELAS conference, “Seismological challenges for stellar structure”, 1-5 February, Lanzarote, Spain

2009 Third HELAS local helioseismology workshop “The Subsurface Structure of Sunspots”, May 12-15, Berlin, Germany.

2009 HELAS NA3 NA4 workshop, “The acoustic solar cycle”, 6-8 January, Birmingham University, U.K.

2008 International Space Science Institute workshop, “Origins and Dynamics of Solar Magnetism”, 21-25 January, Bern, Switzerland

2007 SOHO 19 / GONG2007 “Seismology of Magnetic Activity”, July 9-13, Monash University, Australia.

- **FELLOWSHIPS AND AWARDS**

2005 Visiting scholar, National Solar Observatory, USA (Dr. John Leibacher)

2003 Visiting scholar, High Altitude Observatory, USA (Dr. Phil Judge)

1999 Claire Corani Memorial Prize – Best female second year physics student – Adelaide University

- **INSTITUTIONAL RESPONSIBILITIES**

2012 Direktionsbeirat (Director’s council) (MPS)

2011- Education and public outreach officer for “Solar and Stellar Interiors” department

2009- Webmaster for department website ("Solar and Stellar Interiors", MPS)
2004-2005 Post-graduate representative (Mathematics department, Monash University)

- **COMMISSIONS OF TRUST**

2016 Proposal reviewer, NASA review panel, USA
2015 Proposal reviewer, NASA review panel, USA
2011 Proposal reviewer, NASA review panel, USA
2007- Referee for peer-review journals Nature Communications, Solar Physics, Astronomy and Astrophysics, and Astrophysical Journal.

- **MAJOR COLLABORATIONS**

2018- Waves in the Lower Solar Atmosphere, international research collaboration
2016- Member of TESS Asteroseismic Science Consortium, Working Group 2
2013- Member of SpaceInn consortium, Exploitation of Space Data for Innovative Helio- and Asteroseismology
2012-2016 Co-PI, Collaborative Research Center 963 "Flow Instabilities and Turbulence"
2011- Member of Kepler Asteroseismic Science Consortium working group 1: solar-like stars
2009- Collaborating Scientist, Solar Dynamics Observatory Science Center (NASA project)
2008- Member of the European Helio- and Asteroseismology Network (HELAS)

- **CAREER DEVELOPMENT ACTIVITIES**

2012-2014 Mentee in the Dorothea Schlözer mentoring program (University of Göttingen)
2013 Conflict management (1 day course)
2013 Negotiation skills (2 day course)
2012 Time management (2 day course)

- **EDUCATION AND PUBLIC OUTREACH**

2019 "Sounds of the Stars" interactive display development; Detecting Planets display development; general coordination,
Vierte Nacht des Wissens, Göttingen, Germany
2017 "Sounds of the Stars" interactive display development and coordination
Dritte Nacht des Wissens, Göttingen, Germany
2015 "Sounds of the Stars" interactive display development and presentation,
Zweite Nacht des Wissens, Göttingen, Germany
2012 Public talk "The Sounds of the Stars", Erste Nacht des Wissens, Göttingen, Germany
Contributions to all press releases by the "Interior of the Sun and Stars" department.

- **TEACHING**

2018- Supervisor of doctoral research and dissertation, "Dynamics of emerging solar active regions: Joy's Law", Christian Baumgartner (ongoing)
2017- Supervisor of doctoral research and dissertation, "Flows around active regions", Nils Göttschling (ongoing)
2013-2016 Supervisor of doctoral research and dissertation, "Differential rotation in Sun-like stars from surface variability and asteroseismology", Martin Bo Nielsen

	(summa cum laude, Dr. Berliner - Dr. Ungewitter Prize for outstanding research)
2016	Supervisor of under-graduate project, “Flows around solar pores”, Henrik Wolf
2012	Invited lecturer, ISWI & MAGDAS Summer School on Space Science, 17-26 September, Bandung Indonesia
2008	Guest lecturer, ‘Helioseismology’, International Max Planck Research School
2003-2007	Tutoring (teaching assistant) for undergraduate subjects at Monash University 1st year level: Astronomy laboratory, physics laboratory and general mathematics 2nd year level: Linear algebra, differential equations and astronomy laboratory 3rd year level: Complex analysis

- **PUBLICATION LIST**

[53] A.C. Birch, H. Schunker, D.C. Braun, L. Gizon, “Average surface flows before the formation of solar active regions and their relationship to the supergranulation pattern”, Astron. Astrophys., 628, A37, 2019

[52] H. Schunker, A.C. Birch, R.H. Cameron, D.C. Braun, L. Gizon, R. Burston, “Average motion of emerging active region polarities. I Two phases of emergence”, Astron. Astrophys., 625, A53, 2019

[51] H. Schunker, J. Schou, P. Gaulme, L. Gizon, “Fragile Detection of Solar g-modes by Fossat et. al”, Sol. Phys., 293, 2018

[50] R. Cameron, T.L. Duvall M. Schüssler, H. Schunker, “Observing and modelling the poloidal and toroidal fields of the solar dynamo”, Astron. & Astrophys., 609, A56, 2018

[49] R.H. Cameron, T.L. Duvall Jr., M. Schüssler, H. Schunker, “Observing and modeling the poloidal and toroidal fields of the solar dynamo”, Astron. Astrophys., accepted, 2017

[48] M.B. Nielsen, H. Schunker, L. Gizon, J. Schou, W. Ball “Limits on radial differential rotation in Sun-like stars from parametric fits to oscillation power spectra”, Astron. Astrophys., 603, A6, 2017

[47] A. C. Birch, H. Schunker, D. C. Braun, R. Cameron, L. Gizon, B. Löptien, and M. Rempel, “A low upper limit on the subsurface rise speed of solar active regions,” Science Advances, vol. 2, July 2016.

[46] H. Schunker, D. C. Braun, A. C. Birch, R. B. Burston, and L. Gizon, “SDO/HMI survey of emerging active regions for helioseismology,” Astron. Astrophys., vol. 595, p. A107, Nov. 2016.

[45] H. Schunker, J. Schou, W. H. Ball, M. B. Nielsen, and L. Gizon, “Asteroseismic inversions for radial differential rotation of Sun-like stars: ensemble fits,” Astron. Astrophys., vol. 586, p. A79, Feb. 2016.

[44] H. Schunker, J. Schou, and W. H. Ball, “Asteroseismic inversions for radial differential rotation of Sun-like stars: Sensitivity to uncertainties,” Astron. Astrophys., vol. 586, p. A24, Feb. 2016.

[43] M. B. Nielsen, H. Schunker, L. Gizon, and W. H. Ball, “Constraining differential rotation of Sun-like stars from asteroseismic and starspot rotation periods,” Astron. Astrophys., vol. 582, p. A10, Oct. 2015.

[42] H. Schunker, “The Solar-Stellar Connection,” IAU General Assembly, vol. 22, p. 2257568, Aug. 2015.

[41] H. Rauer, C. Catala, C. Aerts, T. Appourchaux, W. Benz, et al., “The PLATO 2.0 mission,” Experimental Astronomy, vol. 38, pp. 249–330, Nov. 2014.

[40] Nielsen, B. M., Gizon, L., Schunker, H., Schou, and J., “VizieR Online Data Catalog: Rotational frequency splitting in Sun-like stars (Nielsen+, 2014),” VizieR Online Data Catalog, vol. 356, Aug. 2014.

[39] M. B. Nielsen, L. Gizon, H. Schunker, and J. Schou, “Rotational splitting as a function of mode frequency for six Sun-like stars,” Astron. Astrophys., vol. 568, p. L12, Aug. 2014.

[38] D. Braun, H. Schunker, and A. Birch, “A Helioseismic Survey of Emerging Active Regions Using HMI-SDO Data,” in American Astronomical Society Meeting Abstracts #224, vol. 224 of American Astronomical Society Meeting Abstracts, p. 202.01, June 2014.

[37] M. B. Nielsen, L. Gizon, H. Schunker, and C. Karoff, “Measuring Stellar Rotation Periods with Kepler,” in Progress in Physics of the Sun and Stars: A New Era in Helio- and Asteroseismology (H. Shibahashi and A. E. Lynas-Gray, eds.), vol. 479 of Astronomical Society of the Pacific Conference Series, p. 137, Dec. 2013.

[36] F. Hill, C. S. Baldner, R. A. Garc´ıa, M. Roth, and H. Schunker, “Where to go from here: The Future of Helio- and Astero-seismology,” in Fifty Years of Seismology of the Sun and Stars (K. Jain, S. C. Tripathy, F. Hill, J. W. Leibacher, and A. A. Pevtsov, eds.), vol. 478 of Astronomical Society of the Pacific Conference Series, pp. 401–408, Dec. 2013.

[35] S. P. Rajaguru, S. Couvidat, X. Sun, K. Hayashi, and H. Schunker, “Properties of High-Frequency Wave Power Halos Around Active Regions: An Analysis of Multi-height Data from HMI and AIA Onboard SDO,” Solar Phys., vol. 287, pp. 107–127, Oct. 2013.

[34] H. Schunker, L. Gizon, R. H. Cameron, and A. C. Birch, “Helioseismology of sunspots: how sensitive are travel times to the Wilson depression and to the subsurface magnetic field?,” Astron. Astrophys., vol. 558, p. A130, Oct. 2013.

[33] Z.-C. Liang, L. Gizon, H. Schunker, and T. Philippe, “Helioseismology of sunspotsdefocusing, folding, and healing of wavefronts,” Astron. Astrophys., vol. 558, p. A129, Oct. 2013.

[32] M. B. Nielsen, L. Gizon, H. Schunker, and C. Karoff, “Rotation periods of 12 000 main sequence Kepler stars: Dependence on stellar spectral type and comparison with v sin i observations,” Astron. Astrophys., vol. 557, p. L10, Sept. 2013.

[31] M. B. Nielsen, L. Gizon, H. Schunker, and C. Karoff, “VizieR Online Data Catalog:

Rotation periods of 12000 Kepler stars (Nielsen+, 2013)," VizieR Online Data Catalog, vol. 355, Aug. 2013.

[30] M. Svanda, H. Schunker, and R. Burston, "Time-distance inversions for horizontal and vertical flows on supergranular scales applied to MDI and HMI data," Journal of Physics Conference Series, vol. 440, p. 012024, June 2013.

[29] H. Schunker, R. H. Cameron, L. Gizon, and H. Moradi, "Constructing and Characterising Solar Structure Models for Computational Helioseismology," Solar Phys., vol. 271, pp. 1–26, July 2011.

[28] H. Schunker and D. C. Braun, "Newly Identified Properties of Surface Acoustic Power," Solar Phys., vol. 268, pp. 349–362, Feb. 2011.

[29] H. Schunker, R. H. Cameron, L. Gizon, and H. Moradi, "Constructing and Characterising Solar Structure Models for Computational Helioseismology," Solar Phys., vol. 271, pp. 1–26, July 2011.

[28] H. Schunker and D. C. Braun, "Newly Identified Properties of Surface Acoustic Power," Solar Phys., vol. 268, pp. 349–362, Feb. 2011.

[27] R. H. Cameron, L. Gizon, H. Schunker, and A. Pietarila, "Constructing Semi-Empirical Sunspot Models for Helioseismology," Solar Phys., vol. 268, pp. 293–308, Feb. 2011.

[26] H. Schunker, "Local helioseismology and the active Sun," Astronomische Nachrichten, vol. 331, p. 901, Dec. 2010.

[25] H. Moradi, C. Baldner, A. C. Birch, D. C. Braun, R. H. Cameron, T. L. Duvall, L. Gizon, D. Haber, S. M. Hanasoge, B. W. Hindman, J. Jackiewicz, E. Khomenko, R. Komm, P. Rajaguru, M. Rempel, M. Roth, R. Schlichenmaier, H. Schunker, H. C. Spruit, K. G. Strassmeier, M. J. Thompson, and S. Zharkov, "Modeling the Subsurface Structure of Sunspots," Solar Phys., vol. 267, pp. 1–62, Nov. 2010.

[24] L. Gizon, H. Schunker, C. S. Baldner, S. Basu, A. C. Birch, R. S. Bogart, D. C. Braun, R. Cameron, T. L. Duvall, S. M. Hanasoge, J. Jackiewicz, M. Roth, T. Stahn, M. J. Thompson, and S. Zharkov, "Erratum: Erratum to: Helioseismology of Sunspots: A Case Study of NOAA Region 9787," Space Sci. Rev., vol. 156, pp. 257–258, Oct. 2010.

[23] Z. . Liang, L. Gizon, and H. Schunker, "Scattering of helioseismic waves by a sunspot: wavefront healing and folding," ArXiv e-prints, Oct. 2010.

[22] R. Simoniello, W. Finsterle, R. A. Garcia, D. Salabert, A. Jimenez, Y. Elsworth, and H. Schunker, "Acoustic power absorption and enhancement generated by slow and fast MHD waves. Evidence of solar cycle velocity/ intensity amplitude changes consistent with the mode conversion theory," Astron. Astrophys., vol. 516, p. A30, June 2010.

[21] A. Birch, D. C. Braun, A. Crouch, M. Rempel, Y. Fan, R. Centeno, J. Toomre, D. Haber, B. Hindman, N. Featherstone, T. Duvall, Jr., J. Jackiewicz, M. Thompson, R. Stein, L. Gizon, R. Cameron, Y. Saidi, S. Hanasoge, R. Burston, H. Schunker, and H. Moradi, "Developing Physics-Based Procedures for Local Helioseismic Probing of Sunspots and Magnetic Regions," in American Astronomical Society Meeting Abstracts #216, vol. 216 of American Astronomical Society Meeting Abstracts, p. 871, May

2010.

[20] R. Simoniello, W. Finsterle, R. A. Garcia, D. Salabert, A. Jimenez, Y. Elsworth, and H. Schunker, “Acoustic power absorption and enhancement generated by slow and fast MHD waves,” ArXiv e-prints, Apr. 2010.

[19] H. Schunker, R. Cameron, and L. Gizon, “Convectively stabilised background solar models for local helioseismology,” ArXiv e-prints, Feb. 2010.

[18] H. Schunker, R. Cameron, and L. Gizon, “Numerical Simulations of Quiet Sun Oscillations,” in Solar-Stellar Dynamos as Revealed by Helio- and Asteroseismology: GONG 2008/SOHO 21 (M. Dikpati, T. Arentoft, I. Gonzalez Hernandez, C. Lindsey, and F. Hill, eds.), vol. 416 of Astronomical Society of the Pacific Conference Series, p. 49, Dec. 2009.

[17] L. Gizon, H. Schunker, C. S. Baldner, S. Basu, A. C. Birch, R. S. Bogart, D. C. Braun, R. Cameron, T. L. Duvall, S. M. Hanasoge, J. Jackiewicz, M. Roth, T. Stahn, M. J. Thompson, and S. Zharkov, “Helioseismology of Sunspots: A Case Study of NOAA Region 9787,” Space Sci. Rev., vol. 144, pp. 249–273, Apr. 2009.

[16] H. Schunker and L. Gizon, “HELAS Local Helioseismology Activities,” Communications in Asteroseismology, vol. 156, pp. 93–105, Nov. 2008.

[15] H. Schunker, L. Gizon, and M. Roth, “HELAS: local helioseismology data website,” Journal of Physics Conference Series, vol. 118, p. 012087, Oct. 2008.

[14] H. Schunker, D. C. Braun, C. Lindsey, and P. S. Cally, “Physical Properties of Wave Motion in Inclined Magnetic Fields within Sunspot Penumbrae,” Solar Phys., vol. 251, pp. 341–359, Sept. 2008.

[13] H. Schunker, R. Cameron, and L. Gizon, “The seismic effects of a sunspot,” in European Solar Physics Meeting (H. Peter, ed.), vol. 12 of European Solar Physics Meeting, p. 3.5, Sept. 2008.

[12] C. Lindsey, H. Schunker, and P. S. Cally, “Magnetoseismic signatures and flow diagnostics beneath magnetic regions,” Astronomische Nachrichten, vol. 328, p. 298, Mar. 2007.

[11] H. Schunker, D. C. Braun, and P. S. Cally, “Surface magnetic field effects in local helioseismology,” Astronomische Nachrichten, vol. 328, p. 292, Mar. 2007.

[10] L. Gizon, R. Cameron, J. Jackiewicz, M. Roth, H. Schunker, and T. Stahn, “Helioseismology at MPS,” in Modern solar facilities - advanced solar science (F. Kneer, K. G. Puschmann, and A. D. Wittmann, eds.), p. 89, 2007.

[9] H. Schunker, D. C. Braun, P. S. Cally, and C. Lindsey, “Behaviour of Acoustic Waves in Sunspots,” in Solar MHD Theory and Observations: A High Spatial Resolution Perspective (J. Leibacher, R. F. Stein, and H. Uitenbroek, eds.), vol. 354 of Astronomical Society of the Pacific Conference Series, p. 244, Dec. 2006.

[8] H. Schunker and P. S. Cally, “Magnetic field inclination and atmospheric oscillations above solar active regions,” Mon. Not. Roy. Astron. Soc., vol. 372, pp. 551–564, Oct. 2006.

[7] P. S. Cally and H. Schunker, “Magnetic field inclination and atmospheric oscillations above solar active regions: theory,” in Proceedings of SOHO18/GONG 2006/HELAS I, Beyond the spherical Sun, vol. 624 of ESA Special Publication, p. 64.1, Oct. 2006.

[6] H. Schunker and P.S. Cally, “Observed and simulated photospheric velocities within inclined magnetic fields,” in Proceedings of SOHO 18/GONG 2006/HELAS I, Beyond the spherical Sun, vol. 624 of ESA Special Publication, p. 5.1, Oct. 2006.

[5] H. Schunker, D. C. Braun, P. S. Cally, and C. Lindsey, “The interaction between acoustic waves and inclined magnetic fields near the ˜1 layer,” in IAU Joint Discussion, vol. 17 of IAU Joint Discussion, Aug. 2006.

[4] D. C. Braun, H. Schunker, C. Lindsey, and P. S. Cally, “Towards Assessing, Understanding, and Correcting the Influence of Surface Magnetism in Local Helioseismology,” AGU Spring Meeting Abstracts, May 2005.

[3] H. Schunker, D. C. Braun, P. S. Cally, and C. Lindsey, “The Local Helioseismology of Inclined Magnetic Fields and the Showerglass Effect,” Astrophys. J. L., vol. 621, pp. L149–L152, Mar. 2005.

[2] H. Schunker, D. C. Braun, C. Lindsey, and P. S. Cally, “Local Helioseismology of Inclined Magnetic Fields and the Showerglass Effect,” in SOHO 14 Helio- and Asteroseismology: Towards a Golden Future (D. Danesy, ed.), vol. 559 of ESA Special Publication, p. 227, Oct. 2004.

[1] H. Schunker and A.-C. Donea, “Variations of the magnetic fields in large solar flares,” Space Sci. Rev., vol. 107, pp. 99–102, Apr. 2003.