Curriculum Vitae – Alfred Wilson-Spencer

Contact information

School of Earth and Environment
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Education

University College London	Ph.D., Theoretical Mineral physics: *Thermodynamic properties of a terrestrial magma ocean* Advisor: Lars Stixrude	2015-2019
University College London	M.Sci., Geology: *Exploring the structural evolution of Cerberus Fossae, Mars* Advisor: Peter Grindrod	2011-2015

Awards

Doornbos Memorial Award	From the Committee on Studies of the Earth's Deep Interior (SEDI), in association with their biennial meetings, for outstanding work on the Earth's deep interior.	2024

Academic Employment

University of Leeds	Research Fellow	2020-2024
	Senior Research Fellow	2024-Present

Teaching

University College London	Demonstrator, GEOL0057: Geodynamics & Global Tectonics	2016-2018
University College London	Demonstrator, GEOL0043: Tectonic Geomorphology	2018-2019
University of Leeds	Mental health first aid training for faulty staff	Planned 2025

Mentoring

University College London	Ph.D. Student Geoffrey Baron (informal, graduated 2022)	2020-2022
University of Leeds	Final year geophysics independent research projects Sulayman Birt (2021/22), Thomas Rehal (2022/23), Jonah Stacey-Smith (2024/2025).	2021-Present

Funding

University of Leeds	*A pilot scheme for directed mental health first aid training for the Faculty of Environment* **Lead –** Inception, proposal development, mental health first aid instructor (training complete 2024) £7,423.64	Awarded
University of Leeds	*Resolving the inner core nucleation paradox* Natural and Environmental Research Council **Research fellow –** research design and application, publication and dissemination £630,307	2020-2023
University of Leeds	*Solid-Liquid Interactions in Deep Planetary Interiors* Royal Astronomical Society – Specialist Discussion Meeting **Co-convener –** organisation, convening, publication	2022
University of Leeds	*Earth's core as a layered system* Natural and Environmental Research Council **Research fellow -** research design and application, publication and dissemination £1,590,237	2021-2025
University of Leeds / University College London	*Can precipitation of light elements resolve the "New Core Paradox"?* NERC **Co-writer, Named post-doctoral research associate –** proposal design and writing	Submitted
University of Leeds / University College London	*Chemical and thermal history of the Earth's core* EPSRC **Named post-doctoral research associate –** proposal writing	Submitted

Professional Service

Mineralogical Society of GB & NI	Chair of the Mineral Physics Group (94 members) of the Mineralogical Society of the UK and Ireland Trustee of the Mineralogical Society (661 members)	2024-Present
University of Leeds	Equality, Diversity and Inclusivity Committee, School of Earth and Environment Committee member – training development	2023-Present
University of Leeds	Leeds Centre for Planetary Core Dynamics (20 members) Coordinator – administration and management	2022-2024

University of Leeds	Deep Earth Research Group (28 members) Coordinator – meetings and away day organisation	2020-2022
Reviewer	Nature Geosciences, JGR:SE, GJI (Outstanding Reviewer 2023), Geochimica et Cosmochimica Acta, Scientific Reports, Nano Letters National Science Foundation L'Oréal For women in science award	
Convener	AGU 2024, RAS specialist discussion 2022, MPG Research in Progress 2023-2025	
Recruitment	Interview panellist on three occasions	2022-Present
Qualsafe level 3 award	Education and Training	2024
Qualsafe level 3 award	Teaching and Assessing Mental Health Qualifications	2024

Invited talks

Carnegie Institution for Science	Invited	June 2025
University of Oxford	Invited	May 2025
SEDI 2024	*Nucleation and Growth of Earth's inner core*	26th June 2024
European Geophysical Conference	*Precipitation of light elements from Earth's liquid core: Can exsolution power the ancient geodynamo?*	April 2023
IUPAP Conference on Computational Physics	*Probing the nucleation of iron in Earth's core using molecular dynamics simulations of supercooled liquids.*	August 2022
Bayerisches Geoinstitut, Universität Bayreuth	*Properties of the Earth's magma ocean from the two-phase thermodynamic method.*	February 2020
University of California, Los Angeles	*Magma ocean thermodynamics from ab initio calculations.*	June 2019

Broad Audience publications

We may have solved the mystery of what froze Earth's inner core., **Dinneen J.**, *New Scientist*, 2024. https://www.newscientist.com/article/2456287-we-may-have-solved-the-mystery-of-what-froze-earths-inner-core/

The Earth's inner core is a total mystery – here's how we're starting to solve it., **Wilson A.J.**, *The Conversation*, 2024. https://theconversation.com/the-earths-inner-core-is-a-total-mystery-heres-how-were-starting-to-solve-it-238029

Solid-Liquid Interactions in Deep Planetary Interiors., **Wilson A.J.,** Walker A.M, Alfè D. and Davies C.J., *Astronomy & Geophysics magazine*, 2024. https://doi.org/10.1093/astrogeo/atae036

Publications

Wilson, A.J., Davies, C.J., Walker, A.M and Alfè, D. *In review.* Earth's core composition is constrained by inner core nucleation. *Nature Communications.*

Wilson, A.J., Walker, A.M., Deuss, A., Alfè, D, Pozzo, M. and Davies, C.J., 2024*,* The formation and evolution of Earth's inner core. *Nature Reviews Earth & Environment, 6*, p. 140–154.

Pommier, A., Tauber, M.J., Davies, C.J., **Wilson, A.J.**, Renggli, C., Reitze, M., Bullock. E., *Accepted,* Electrical Properties of Alkaline Earth Sulfides and Implications for the Interior of Mercury. *Journal of Geophysical Research: Planets.*

Davies, C.J., Pommier, A., Greenwood, S. and **Wilson, A.**, 2024. Thermal and magnetic evolution of Mercury with a layered Fe-Si (-S) core. *Earth and Planetary Science Letters*, *641*, p.118812.

Walker, A.M., Davies, C.J., **Wilson, A.J.** and Bergman, M.I., *Accepted.* A non-equilibrium slurry model for planetary cores with application to Earth's F-layer, *Proceedings of the Royal Society*

Wilson, A.J., Pozzo, M., Davies, C.J., Walker, A.M. and Alfè, D., 2023. Examining the power supplied to Earth's dynamo by magnesium precipitation and radiogenic heat production. *Physics of the Earth and Planetary Interiors*, *343*, p.107073.

Wilson, A.J., Alfè, D., Walker, A.M. and Davies, C.J., 2023. Can homogeneous nucleation resolve the inner core nucleation paradox?. *Earth and Planetary Science Letters*, *614*, p.118176.

Wilson, A.J., Pozzo, M., Alfè, D., Walker, A.M., Greenwood, S., Pommier, A. and Davies, C.J., 2022. Powering Earth's ancient dynamo with silicon precipitation. *Geophysical Research Letters*, *49*(22), p.e2022GL100692.

Wilson, A.J., Walker, A.M., Alfè, D. and Davies, C.J., 2021. Probing the nucleation of iron in Earth's core using molecular dynamics simulations of supercooled liquids. *Physical Review B*, *103*(21), p.214113.

Wilson, A.J. and Stixrude, L., 2021. Entropy, dynamics, and freezing of CaSiO3 liquid. *Geochimica et Cosmochimica Acta*, *302*, pp.1-17.

Citron, R.I., Lourenço, D.L., **Wilson, A.J.**, Grima, A.G., Wipperfurth, S.A., Rudolph, M.L., Cottaar, S. and Montési, L.G., 2020. Effects of heat-producing elements on the stability of deep mantle thermochemical piles. *Geochemistry, Geophysics, Geosystems*, *21*(4), p.e2019GC008895.

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