

# Andrew J. Smye

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## Primary Research Interests

Metamorphic petrogenesis; radioisotope geochronology; the thermal and chemical evolution of continental lithosphere; the role of fluids in crustal evolution; deep Earth volatile cycles.

## Academic Appointments

April 2016 – present	<b>Assistant Professor</b> Department of Geosciences, The Pennsylvania State University
March 2015 – April 2016	<b>NERC Independent Research Fellow</b> Department of Earth Sciences, University of Oxford
Sept. 2012 – March 2015	<b>Jackson Distinguished Postdoctoral Fellow</b> Department of Geological Sciences, Jackson School of Geosciences University of Texas at Austin
August 2011 – Sept. 2012	<b>Post-Doctoral Research Associate</b> NERC Isotope Geoscience Laboratories, British Geological Survey

## Educational Background

February 2012	<b>Ph.D.</b> , Metamorphic Petrology, Geochronology and Structural Geology University of Cambridge Supervisors: Tim Holland, Mike Bickle; Committee: Chris Hawkesworth, Marian Holness
June 2007	<b>M.Sci.</b> , Earth Sciences ( <i>First-class honors</i> ) University of Oxford Research advisors: Dave Waters and Marc St-Onge (Geological Survey of Canada)

## Awards and Honors

2015	<b>Junior Research Fellowship</b> ( <i>non-stipendiary</i> ), St Edmund Hall, Oxford
2014	<b>NERC Independent Research Fellowship</b>
2012	<b>Jackson School Distinguished Postdoctoral Fellowship</b>
2010	<b>BP Scholarship</b>
2010	<b>Tony Carswell Award</b> , Metamorphic Studies Group
2009	<b>Magdalene College Travel Award</b>
2007	<b>St Edmund Hall Academic Scholarship, University of Oxford</b>
2006	<b>Keith Cox Prize</b> , University of Oxford
2006	<b>Geological Survey of Canada Research Placement</b>
2005	<b>Geological Survey of Canada Research Placement</b>
2005	<b>St Edmund Hall Travel Award</b>
2007	<b>St Edmund Hall Academic Exhibition</b>

## Funding Obtained

- 2016 – 2021 **NSF-PIRE: ExTerra Field Institute and Research Endeavor**  
(Co-I, EAR-1545903, \$4,022,940 split between 9 institutions)
- 2015 – 2020 (*terminated 2016*) **NERC Independent Research Fellowship**  
Noble gas systematics of subduction, University of Oxford, U.K.: £514,272
- 2012 – 2015 **Jackson Postdoctoral Fellowship**  
University of Texas, U.S.A.: \$140,000
- 2009 **NERC Facilities grant**  
IP/1068/1108 (Co-I, £21,100), U-Pb geochronology

## Invited Seminars

- 2016 University of Cambridge, UK
- 2015 AGU Fall Meeting. Session: Resolving Process through Geochronology
- 2015 University of St Andrew's, UK
- 2015 Goldschmidt Geochemistry Conference, Prague, CZ. Session: Accessory Mineral Petrology, Geochemistry, Geochronology, Diffusion, and Kinetics. **Keynote**
- 2015 University of Oxford, UK
- 2014 Jackson School of Geosciences, Austin, TX
- 2014 Goldschmidt Geochemistry Conference, Sacramento, CA. Session: Putting the little t in P-T-H<sub>2</sub>O-t: Novel integrations of geochronology and thermodynamics in diverse tectonic regimes
- 2014 Goldschmidt Geochemistry Conference, Sacramento, CA. Session: Geologic and geochemical processes at the plate interface
- 2014 The Pennsylvania State University, State College, PA

## Workshops and Courses

- 2013 **International Lithosphere Program**  
Nature of the Plate Interface in Subduction Zones Workshop, California
- 2012 **NERC Grantsmanship short course**  
British Geological Survey, Keyworth (2 days)
- 2012 **Nuts and Bolts of sector-field isotope ratio mass spectrometry**  
Geochemical Society funded; University of Bristol (3 days).
- 2011 **GTSnext <sup>40</sup>Ar–<sup>39</sup>Ar and U–Pb geochronology workshop**  
Marie Curie FP7; NIGL, U.K. (2 days)
- 2010 **GTSnext radiogenic isotopic geochronology workshop**  
Marie Curie FP7; Verbania, Italy (5 days)
- 2009 **EURISPET HP metamorphism and subduction zones workshop**  
Places competitively awarded; Marie Curie FP6; Granada, Spain

## Teaching and Mentoring Experience

- **Undergraduate Tutorials** *March 2015 –*  
Series of tutorials in igneous and metamorphic petrology to Oxford 1st and 2nd-year students.
- **Undergraduate Research Advisor** *Dec 2013–current*  
Senior student (K. Umbarger) project on tectono-thermal evolution of the California Coastal Range.
- **Guest Lecturer** *Nov 2012–current*  
Continental Tectonics and Thermochronology, UT graduate classes
- **Field Supervisor:** (U/Th)–He sample collection in Canadian Rockies. *Oct 2011*
- **Field Lecturer:** Final-year Betic field trip; series of talks on regional P–T–t data *April 2009 and 2010*

- **Postgraduate Demonstrator.** Oct 2007–Aug 2010  
Introduction to Geology, Metamorphic Petrology, Evolution of the lithosphere, Geological mapping.
- **Co-supervisor of MSc thesis** Jul 2008–Jun 2009  
*Study of the metamorphic evolution of an eclogite zone, Tauern Window* (L. Greenwood, Cambridge, 2008).
- **Undergraduate Supervisor** 2007–2010  
Introductory Geology, Geological Maps, Metamorphic Petrology and Himalayan Geology. 2007–2010
- **Teacher:** Community outreach program - Geology for Schools day. Feb 2009

## List of Publications

### In Review

- Smye, A.J.**, Lavier, L., Stockli, D. and Zack, T. Crustal reheating and mantle upwelling during continental break-up triggered by lithospheric instabilities; *under review from 09/2015 in Nature Geoscience*.
- Seymour, N., Stockli, D., Beltrando, M. and **Smye, A.J.** Tracing the thermal evolution of lower continental crust through continental extension; *under review from 03/2016 in Tectonics*.

### Published

- 10 Bracciali, L., Parrish, R., Najman, Y., Carter, A., Wijbrans, J. and **Smye, A.J.** Plio-Pleistocene exhumation of the eastern Himalayan syntaxis and its domal 'pop-up'; in revision, *Earth Science Reviews*.
- 9 Sathaye, K., **Smye, A.J.**, Jordan, J. and Hesse, M. Noble gases preserve history of retentive continental crust; *Earth and Planetary Science Letters*, 2016–443, 32–40; doi: 10.1016/j.epsl.2016.03.014.
- 8 Jackson, C.R.M., Shuster, D., Parman, S.W. and **Smye, A.J.** Noble gas diffusivity hindered by low energy sites in amphibole; *Geochimica et Cosmochimica Acta*, 2015; doi:10.1016/j.gca.2015.09.024.
- 7 **Smye, A.J.** and Stockli, D. Rutile U-Pb age depth profiling: a continuous record of lithospheric thermal evolution; *Earth and Planetary Science Letters*, 2014–408, 171–182; doi: 10.1016/j.epsl.2014.10.013.
- 6 **Smye, A.J.**, Roberts, N., Condon, D.J., Horstwood, M.S.A., Parrish, R.R. and Noble, S.R. Characterizing the U-Th-Pb systematics of allanite by ID and LA-ICPMS: implications for geochronology; *Geochimica et Cosmochimica Acta*, 2014–135, 1–28; doi:10.1016/j.gca.2014.03.021.
- 5 **Smye, A.J.**, Warren, C. and Bickle, M.J. The signature of devolatilisation: extraneous <sup>40</sup>Ar systematics in high-pressure metamorphic rocks; *Geochimica et Cosmochimica Acta*, 2013–113, 94–112; doi:10.1016/j.gca.2013.03.018.
- 4 Warren, C., **Smye, A.J.**, Kelley, S. and Sherlock, S. Using white mica <sup>40</sup>Ar/<sup>39</sup>Ar data as a tracer for fluid flow and permeability under high-P conditions: Tauern Window, Eastern Alps; *Journal of Metamorphic Geology*, 2011–30, 63–80; doi:10.1111/j.1525-1314.2011.00956.x.
- 3 **Smye, A.J.**, Bickle, M.J., Holland, T.J.B., Parrish, R.R. and Condon, D.J. 2011. Rapid formation and exhumation of the youngest Alpine eclogites: A thermal conundrum to Barrovian metamorphism; *Earth and Planetary Science Letters*, 2011–306, 193–204; doi:10.1016/j.epsl.2011.03.037.
- 2 **Smye, A.J.**, Greenwood, L., and Holland, T.J.B., 2010. Garnet–chloritoid–kyanite assemblages: Eclogite facies indicators of subduction constraints in orogenic belts; *Journal of Metamorphic Geology*, 2010–28, 753–768; doi: 10.1111/j.1525-1314.2010.00889.x.
- 1 **Smye, A.J.**, St-Onge, M.R., and Waters, D.J., 2009. Contrasting metamorphic pressure–temperature histories within the Trans-Hudson Orogen's hinterland, southwest Baffin Island, Nunavut; *Geological Survey of Canada, Current Research* 2009–6, 18 p.

### In Preparation

- Smye, A.J.**, Stockli, D. Resolving lithospheric thermal histories using accessory phase speedometry; *invited submission for Chemical Geology*.
- Smye, A.J.**, Jackson, C. and others. Kinetic fractionation of noble gases during subduction.

## Professional Activities

- **Referee:** *EPSL, Geology, Journal of Metamorphic Geology, Lithos, Terra Nova, JAES & Contributions to Mineralogy and Petrology, Tectonics,*
- **Member:** *American Geophysical Union, Geochemical Society and Metamorphic Studies Group*