

Jessica M. Warren

Geology and Geophysics
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EDUCATION

MIT/WHOI Joint Program, Woods Hole, MA

Doctor of Philosophy, Geochemistry and Geophysics, 2007

Thesis: The Oceanic Upper Mantle: Rheological and Geochemical Constraints

Advisors: Nobumichi Shimizu, Greg Hirth, Henry J. B. Dick

University of Cambridge, Cambridge, UK

Master in Science, Earth Sciences, 2000

Thesis: Characteristics of the Ardnamurchan Contact Aureole

Advisor: Marian B. Holness

Bachelor of Arts, *First Class Hons*, Natural Sciences Tripos, 1999

Thesis: Report on the Geology of an Area of the Morenci District, Arizona

Advisor: David M. Pyle

HONORS AND FELLOWSHIPS

2005-2006 COE-21 Collaborative Researcher, ISEI, Japan

2003-2007 WHOI Graduate Research Fellow, Woods Hole, MA

2002 Stanley W. Watson Fellowship, Woods Hole, MA

2001-2002 Charles Davis Hollister Fellowship, Woods Hole, MA

1998-1999 Skerne Scholarship, Cambridge, UK

RESEARCH EXPERIENCE

2001-2007 MIT/WHOI Joint Program, Woods Hole, MA

Graduate Researcher

Thesis research is on the rheology and geochemistry of the mantle. Peridotites, collected on land and at sea, are used to look at processes occurring beneath the Earth's crust, in the lithospheric mantle and the asthenosphere. Techniques employed include ion probe, electron microprobe, petrography, EBSD, ICPMS and TIMS.

2005-2006 Institute for Study of the Earth's Interior, Okayama University, Japan

COE-21 Collaborative Researcher

Participated in a study of the scale of mid-ocean ridge mantle heterogeneities. Used TIMS and ICPMS to analyze peridotite mineral separates for trace elements and Nd, Sr, and Pb isotopes.

1999-2000 University of Cambridge, Cambridge, UK

Graduate Researcher

Engaged in research on contact metamorphism in NW Scotland; field work, petrography, microprobe, XRD and thermodynamic modeling were used to constrain the *PTt* history of the intrusion.

1998-1999 University of Cambridge, Cambridge, UK

Undergraduate Researcher

Conducted mapping of a geologically poorly-defined area in the Apache Nat'l Forest, Arizona; responsible for all field logistics.

- RELATED EXPERIENCE **2006** Participant in the second Cooperative Institute for Deep Earth Research, KITP, USA
2003-2004 MIT/WHOI Joint Program Representative to the Educational Assembly, WHOI, USA
2001 SCA Conservation Internship, Div. Sci. & Res. Mgmt, Mammoth Cave Nat'l Park, USA
1997 Smithsonian Institution Internship, Dept. Min. Sci., Smithsonian Institution, USA
- TEACHING AND MENTORING EXPERIENCE **2004** MIT/WHOI Joint Program (Woods Hole, MA)
Teaching Assistant
Introduction to Marine Geology and Geophysics
Responsible for homeworks, weekly meetings, and labs
2004-2005 MIT, Dept. of Earth, Atm. and Planet. Sciences (Cambridge, MA)
Mentor, EAPS Graduate Student Mentoring program
Assisted pre-generals students with adjusting to the academic environment
- AT SEA EXPERIENCE **2004** R/V Knorr, with ROV Jason-2 and AUV ABE (5 weeks)
“Magnetic and Structural Studies of a Lower Crustal Exposure of Ocean Lithosphere: Kane Megamullion, Mid-Atlantic Ridge 23°30'N”
2003 R/V Melville (3 weeks)
“Investigation of the Oblique and Orthogonal Supersegments of the Southwest Indian Ridge”
2001 R/V Yokosuka, with DSV Shinkai-6500 (6 weeks)
“Investigation of Atlantis Bank and the SW Indian Ridge from 56°E to 58°E”
- PROFESSIONAL SOCIETIES **2001-present** American Geophysical Union
2001-present Mineralogical Society of America
- PUBLICATIONS Courtier, A. M., M. G. Jackson, J. F. Lawrence, Z. Wang, C.-T. A. Lee, R. Halama, **J. M. Warren**, R. Workman, W. Xu, M. M. Hirschmann, A. M. Larson, S. R. Hart, C. Lithgow-Bertelloni, L. Stixrude, W.-P. Chen, 2007. Correlation of seismic and petrologic thermometers suggests deep thermal anomalies beneath hotspots, *Earth and Planetary Science Letters* 264, 308-316.
Dantas, C., G. Ceuleneer, M. Gregoire, M. Python, R. Freydier, **J.M. Warren**, and H.J.B. Dick, 2007. Pyroxenites from the Southwest Indian Ridge, 9-16°E: Cumulates from Incremental Melt Fractions Produced at the Top of a Cold Melting Regime, *Journal of Petrology*, 48(4), 647-660.
Warren, J.M. and G. Hirth, 2006. Grain Size Sensitive Deformation Mechanisms in Naturally Deformed Peridotites, *Earth and Planetary Science Letters* 248, 423-435.
- SUBMITTED PAPERS **Warren, J.M.**, G. Hirth and P. B. Kelemen. Evolution of olivine lattice preferred orientation during simple shear in the mantle, submitted to *Earth and Planetary Science Letters* 11/2007.
- PAPERS IN PREPARATION **Warren, J.M.**, N. Shimizu, C. Sakaguchi, H.J.B. Dick, and E. Nakamura. Peridotite Isotopic Heterogeneity Along the Ultra-Slow Spreading SWIR Oblique Supersegment.
Warren, J. M., N. Shimizu, and H. J. B. Dick. Variations in Abyssal Peridotite Composition: Implications for Oceanic Upper Mantle Composition and Processes.

SELECTED
ABSTRACTS AND
CONFERENCES

Warren, J.M., N. Shimizu, H.J.B. Dick, C. Sakaguchi and E. Nakamura, 2006. Peridotite Heterogeneity Along the Ultra-Slow Spreading SWIR Oblique Supersegment, *Fall AGU*, V11G-06.

Shimizu, N., **J.M. Warren**, F.A. Frey and E. Takazawa, 2006. The Horoman Peridotite Massif: an Example of Ancient Ultraslow-Spreading Ridge Abyssal Peridotites?, *Fall AGU*, V12C-07.

Kurz, M.D., J. Curtice, **J.M. Warren**, N. Shimizu and H.J.B. Dick, 2006. Helium in Abyssal Peridotites: New Results From the Southwest Indian Ridge, *Fall AGU*, V11G-07.

Warren, J.M., N. Shimizu, C. Sakaguchi, E. Nakamura and H.J.B. Dick, 2006. Large local-scale isotopic heterogeneities of the MORB source mantle: A case study on the SWIR, *Geochimica et Cosmochimica Acta* 70, A585.

Shimizu, N., **J.M. Warren** and H.J.B. Dick, 2006. The effects of melt extraction and melt-rock reaction on abyssal peridotite geochemistry, *Geochimica et Cosmochimica Acta* 70, A586.

Sakaguchi, C., **J.M. Warren**, N. Shimizu, H.J.B. Dick and E. Nakamura, 2005. Abyssal Peridotites From Ultra-Slow Spreading Ridges: Mantle Heterogeneities Versus Melting Processes, *Eos Trans. AGU* 86(52), Fall Meet. Suppl., T41E-1352.

Warren, J.M. and G. Hirth, 2005. A Natural Example of Olivine LPO Variation With Shear Strain, *Eos Trans. AGU* 86(52), Fall Meet. Suppl., T13A-0423.

Warren, J.M., N. Shimizu and H.J.B. Dick, 2004. Ultra-slow spreading ridges and mantle heterogeneities, *Geochimica et Cosmochimica Acta* 68, A696.

Warren, J.M., N. Shimizu and H.J.B. Dick, 2003. Melt impregnation revealed by clinopyroxene geochemistry in abyssal peridotites, *Geochimica et Cosmochimica Acta* 67, A526.

Warren, J.M., M. Braun, G. Hirth and H.J.B. Dick, 2002. Microstructural evidence for grain size sensitive deformation mechanisms in naturally deformed peridotites, *Eos Trans. AGU* 83(47), Fall Meet. Suppl., MR51A-03.

Warren, J.M., N. Shimizu, and H.J.B. Dick, 2002. High pressure melt impregnation in a mantle peridotite, *Fourth International Workshop on Orogenic Lherzolites and Mantle Processes*.

REFERENCES

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