

# Megan S. Duncan

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## Professional Experience

### **Assistant Professor**

Virginia Tech, Department of Geosciences – Blacksburg, VA, USA – 2019-present

### **Postdoctoral Associate**

University of California, Davis – Davis, CA, USA – 2018-2019

- Mentor: Sarah Stewart

### **Postdoctoral Associate**

Carnegie Institution of Washington, Geophysical Laboratory – Washington, DC, USA – 2015-2018

- Mentor: Yingwei Fei

## Education and Research Experience

### **PhD Earth Science**

Rice University – Houston, TX, USA – 2010-2015

- Dissertation: Carbon in silicate melt - Experimental constraints and applications for the subduction zone and magma ocean carbon cycles
- Advisor: Rajdeep Dasgupta

### **MS Earth and Planetary Sciences**

University of New Mexico – Albuquerque, NM, USA – 2008-2010

- Thesis: The partial molar volume of carbon dioxide in peridotite partial melt at high pressure
- Advisor: Carl Agee

### **BS Geology**

Clemson University – Clemson, SC, USA – 2003-2007

Graduated Magna Cum Laude with Departmental Honors

- Senior Thesis: Characterizing fractured, crystalline aquifers using multi-level, interference slug tests
- Advisor: Larry Murdoch

### **CIDER (Cooperative Institute for Dynamic Earth Research)**

Participant – Summer 2016

- Participated in collaborative research projects: “Metastability in the Mantle Transition Zone: A Collaborative Geodynamic, Petrologic, and Seismological Approach” and “On the Origin of High Shear Wave Velocities in the Deep Roots of Cratons”

Participant – Summer 2014

- Participated in collaborative research project: “Mars Thermal History: Core, Atmosphere, Mantle, Phobos and Surface”

## Organizations

### **American Geophysical Union**

Member – 2008-Current

### **Geological Society of America**

Member – 2014-Current

### **Mineralogical Society of America**

Member – 2019-Current

### **COMPRES**

Education Outreach Infrastructure and Development Committee Member – 2019-present

## Publications

- Muth, M., **M. S. Duncan**, R. Dasgupta. (2020). The effect of variable Na/K on the CO<sub>2</sub> content of slab-derived rhyolitic melts. In *Carbon in Earth's Interior* (ed. C. E. Manning, J.-F. Lin, W. L. Mao). doi: 10.1002/9781119508229.ch17
- Stewart, S. T., E. J. Davies, **M. S. Duncan**, S. J. Lock, S. Root, J. P. Townsend, R. G. Kraus, R. Caracas, S. B. Jacobsen. (2019) Equation of State Model Forsterite-ANEOS-SLVTv1.0G1: Documentation and Comparisons (Version v1.0.0). Zenodo. doi: 10.5281/zenodo.3478631
- Duncan, M.S.**, N. C. Schmerr, C. M. Bertka, Y. Fei. (2018) Extending the solidus for a model ion-rich martian mantle composition to 25 GPa. *Geophys. Res. Lett.*, 45: 10,211–10,220. doi: 10.1029/2018GL078182
- Garber, J. M., S. Maurya, J.-A. Hernandez, **M. S. Duncan**, L. Zeng, H. Zhang, U. Faul, C. A. McCammon, J.-P. Montagner, L. N. Moresi, B. A. Romanowicz, R. L. Rudnick, L. P. Stixrude. (2018) Multi-disciplinary constraints on the abundance of diamond and eclogite in the cratonic lithosphere. *Geochem. Geophys. Geosys.*, 19. doi: 10.1029/2018GC007534
- Duncan, M. S.** and R. Dasgupta. (2017) Rise of Earth's atmospheric oxygen controlled by efficient subduction of organic carbon. *Nat. Geosci.*, 10, 387. doi: 10.1038/ngeo2939
- Duncan, M. S.**, R. Dasgupta, K. Tsuno. (2017) Experimental determination of CO<sub>2</sub> content at graphite saturation along a natural basalt-peridotite melt join: Implications for the fate of carbon in terrestrial magma oceans. *Earth Planet. Sci. Lett.*, 466: 115–128. doi: 10.1016/j.epsl.2017.03.008
- Duncan, M. S.** and R. Dasgupta. (2015) Pressure and temperature dependence of CO<sub>2</sub> solubility in hydrous rhyolitic melt – Implications for carbon transfer to mantle source of volcanic arcs via partial melt of subducting crustal lithologies. *Contrib. Mineral. Petrol.*, 169: 54. doi: 10.1007/s00410-015-1144-5
- Chi, H., R. Dasgupta, **M. S. Duncan**, N. Shimizu (2014) Partitioning of carbon between Fe-rich alloy melt and silicate melt in a magma ocean – Implications for the abundance and origin of volatiles in Earth, Mars, and the Moon. *Geochim. Cosmochim. Acta*, 139: 447–471. doi: 10.1016/j.gca.2014.04.046
- Duncan, M. S.** and R. Dasgupta. (2014) CO<sub>2</sub> solubility and speciation in rhyolitic sediment partial melts at 1.5-3.0 GPa – Implications for carbon flux in subduction zones. *Geochim. Cosmochim. Acta*, 124: 328–347. doi: 10.1016/j.gca.2013.09.026
- Duncan, M. S.** and C. B. Agee. (2011) The partial molar volume of carbon dioxide in peridotite partial melt at high pressure. *Earth Planet. Sci. Lett.*, 312: 429–436. doi: 10.1016/j.epsl.2011.10.021
- van Kan Parker, M., C. B. Agee, **M. S. Duncan**, W. van Westrenen. (2011) Compressibility of molten Apollo 17 orange glass and implications for density crossovers in the lunar mantle. *Geochim. Cosmochim. Acta*, 75: 1161–1172. doi: 10.1016/j.gca.2010.11.022