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Sustainability Seminar Series

Sustainability Seminar Series, 2018

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Apr 17th, 4:00 PM - 5:00 PM

## **Magmatism and Mass Extinction: Resolving the Flood Basalt Carbon Quandary**

Benjamin Black  
*The City University of New York*

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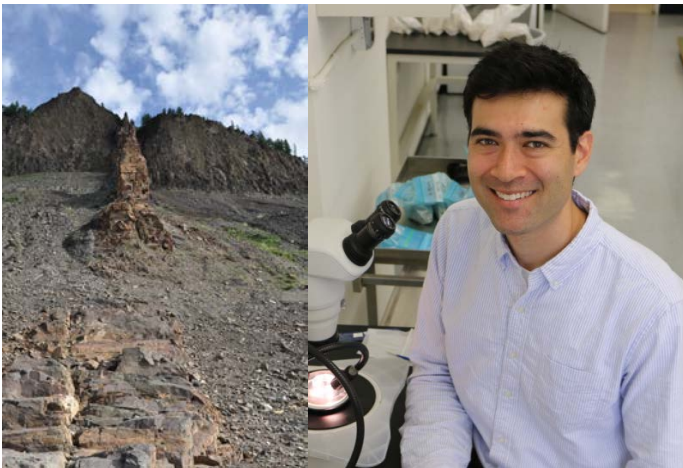
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The MSU Sustainability Seminar Series Presents:  
**Magmatism and mass extinction:  
resolving the flood basalt carbon quandary**

WHEN: April 17, 4:00 pm

WHERE: CELS 120 lecture hall

**Dr. Benjamin Black**  
**The City University of New York**



Dr. Black is an assistant professor at CUNY's City College and Grad Center campuses. His research investigates how outgassing from magmas has shaped surface climate through geologic time.

Voluminous flood basalt magmatism has coincided with multiple biotic crises, including the end-Permian, end-Triassic, and end-Cretaceous mass extinctions and the Paleocene-Eocene Thermal Maximum. Geochemical evidence shows that warming and carbon cycle perturbation were features of each of these events. This proxy evidence is at odds with current estimates of the budget and isotopic composition of carbon in flood basalt magmas, which suggest that flood basalt magmatic carbon is inadequate and too isotopically heavy to explain the observations. To address the apparent conflict between paleoclimate and petrology, I present results from melt inclusions, carbonatites, geophysical modeling, and climate modeling to address hypotheses including metamorphic release of crustal carbon and upward revision of the magmatic carbon budget. Intervals of extreme stress during past flood basalt eruptions carry a range of implications for Earth's near-future climate systems.