




Please note: All live events are scheduled for Eastern Time (America/New York) via the [virtual conference platform](#). You can change time zone using the link in the navigation panel on the left.

All Oral presentations listed on this agenda are only accessible via the [virtual conference platform](#).

## 138-13 - ELLIPTICITY OF TEKTITE-LIKE, HIGH SiO<sub>2</sub> SPHERULES FROM THE ROSS SEA

 Wednesday, 28 October 2020

 4:20 PM - 4:30 PM

 GSA e-Attend Platform - Meeting Rooms

### Abstract

High SiO<sub>2</sub> spherules have been found in abundance in Antarctic Ross Sea cores at subbottom depths of 10 to 800 cm. Their morphology is variable, ranging from round to ovoid. Many spherules resemble tektites, featuring aerodynamic shapes, such as dumbbells and spheroids with short tails [1]. However, many Ross Sea spherules display characteristics that have not been observed in tektites, including pimpled surfaces and long tails. While these spherules are often >90% SiO<sub>2</sub>, they are composed of alternating layers of C and SiO<sub>2</sub>, and these layers often exfoliate along their contact surface. Additionally, many Ross Sea spherules feature long ablation tracks on their surfaces. Some researchers have proposed a cyclic model of formation for Ross Sea spherules, wherein seasonal ice melts increase salinity of the Ross Sea, leading to greater silica precipitation [2]. Others have proposed a biological origin [3]. These hypotheses are unsatisfying, as the aerodynamic shapes observed in Ross Sea Spherules would not be produced by simple precipitation. Moreover, neither the geochemical composition nor new SEM images are indicative of a biological origin. Ross Sea Core NBP9501-39KC has been previously dated [4]. The age model for this core indicates an age of circa 10-13 ka BP. Sixty-eight *Orbulina Universa* were picked and digitally analyzed against 89 Ross Sea Spherules for ellipticity. Ross Sea Spherules are morphologically distinct (ellipticity of 0.201 ± 0.027) from *Orbulina Universa* (ellipticity of .068 ± .006), precluding a biological mechanism of formation.

- [1] O'Keefe, John Aloysius. 1976. "Tektites and Their Origin." Netherlands: Elsevier Scientific Publishing Company.
- [2] Perry, Pamela. 1999. "Quaternary Benthic Foraminiferal Distribution in the Ross Sea, Antarctica, and Its Relationship to Oceanography." Louisiana State University.
- [3] Weiterman, SD and Russell, MD. 1986. "Siliceous ooids from antarctic marine sediments." Antarctic Journal of the United States, Volume 21, Issues 1-5. Pp. 159.
- [4] Cunningham, W. L., Leventer, A., Andrews, J. T., Jennings, A. E., and Licht, K. J., 1999. "Late Pleistocene-Holocene marine conditions in the Ross Sea, Antarctica: evidence from the diatom record." The Holocene, v. 9, p. 129-139.

Geological Society of America Abstracts with Programs. Vol 52, No. 6, 2020  
doi: 10.1130/abs/2020AM-358357

© Copyright 2020 The Geological Society of America (GSA), all rights reserved.

## Authors



**Gavin S. Perri**

Lamont-Doherty Earth Observatory



**Dallas H. Abbott**

Lamont-Doherty Earth Observatory



Emma Michelini

## Eposter Link

EPoster

## View Related

### Session

**138: T89. Applying Near Surface Geophysics to Solve Geological Problems**

**Kevin L. Mickus**, *Dept. of Geography, Geology, and Planning, Missouri State University, Springfield, MO*



Wednesday, 28 October 2020



1:30 PM - 5:30 PM



GSA e-Attend Platform - Meeting Rooms

Topical Sessions



Technical Programs