



The Clay Minerals Society

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2019 CMS PROFESSIONAL AWARD RECIPIENT SPOTLIGHT



Dennis Eberl at the 2017 March for Science in Washington DC (USA).

Dennis Eberl and Colleen Hansel received the 2019 Clay Minerals Society (CMS) awards at the EuroClay 2019 conference, which was held 1–5 July 2019 in Paris (France).

Dr. Dennis D. Eberl has received the **Marilyn and Sturges W. Bailey Distinguished Member Award**. Dennis earned a BA in geology from Dartmouth College (New Hampshire, USA) in 1965 and a PhD in geochemistry from Case Western Reserve University (Ohio, USA) in 1971. He taught geology at the Northern Illinois

University in DeKalb (USA) and at the University of Illinois at Urbana-Champaign (USA) before joining the National Research Program at the US Geological Survey in Colorado (USA) in 1981. He retired in 2011 and now divides his time between Colorado (USA) and Baja California Sur (Mexico). Dennis developed a variety of highly useful analytical computer programs during his career: these include quantitative mineral analysis by X-ray diffraction (XRD) (RockJock program), the determination of sediment provenance from quantitative mineralogy (SedUnMix program), a theory to describe crystal growth mechanisms from the shapes of crystal size distributions (Galoper program), a method to measure crystallite size by XRD (MudMaster program), a method to calculate the precise chemistry of minerals in mixtures (HandLens program), and the calculation of XRD patterns for mixed-layer illite/smectite from an input of crystallite thickness distributions (StackMan program). These and other techniques were used in geological studies that included the quantitative mineralogy of the Yukon River system (North America), the quantitative soil mineralogy of North America from continental-scale transects, the mineralogy and provenance of North Atlantic bottom sediments, the investigation of antibacterial clays, the invention of a nonpolluting zeo-fertilizer, the mineralogy of hydrothermal illite from the San Juan Mountains (USA), the origin of spring deposits in the Amargosa Desert (USA), and the hydrothermal synthesis of clay minerals.



Dr. Colleen M. Hansel has received **Marion L. and Chrystie M. Jackson Mid-Career Clay Scientist Award**. Colleen is an associate scientist in the Department of Marine Chemistry and Geochemistry at the Woods Hole Oceanographic Institution (WHOI) (Massachusetts, USA). Prior to joining the scientific staff at WHOI, Colleen was an associate professor at Harvard University (Massachusetts, USA), joint between the Department of Earth and Planetary Sciences and the School of

Engineering and Applied Sciences. She obtained a BS in geology at California State University, Sacramento, in 1997, an MS in environmental chemistry at the University of Idaho (USA) in 1999, and PhD in biogeochemistry at Stanford University (California, USA) in 2004. Colleen was a postdoctoral investigator in molecular microbial ecology at Stanford from 2004 to 2006. Over the years, Colleen's research has centered on the cycling and mineralization of metals within terrestrial and marine systems, using a range of microscopic and spectroscopic techniques. Most recently, Colleen's research program has focused on coupled elemental cycles and cryptic processes that control the biogeochemistry and the health of various marine ecosystems, ranging from coral reefs to the deep biosphere. One particular emphasis is the cycling

and sources of reactive oxygen species and the impact of their formation on other elemental cycles and organismal health. To enable this research, Colleen has established a collaborative program to design and develop new in situ submersible sensing technologies to enable measurement of short-lived intermediates, such as reactive oxygen species, over various spatial scales.

STUDENT RESEARCH SPOTLIGHT

Congratulations to Zachary Burton from Stanford University (California, USA) and Bidemi Fashina from Texas A&M (USA) for winning the 2019 CMS Student Research Grants!



Zachary Burton is a PhD candidate in the Department of Geological Sciences at Stanford University and a research assistant at the Search for Extra-Terrestrial Intelligence (SETI) Institute (USA) and the NASA Astrobiology Institute (USA). Zachary's research with Dr. Stephan Graham at Stanford focuses on the marine geology of continental margins, while his work with Dr. Janice Bishop at SETI/NASA focuses on the analysis of clays, salts, and other sediments in the Antarctica

Dry Valleys with the purpose of characterizing these materials as suitable analogues for materials formed and altered under the cold, dry conditions on Mars. He is thankful for the support provided by CMS to further his research on Antarctic clay minerals. In his free time, he writes poetry on innovative space science ("planetary poetry"), which has been featured in *The Wall Street Journal*.



Bidemi Fashina is a PhD student at the Soil Mineralogy Group in the Department of Soil and Crop Sciences, Texas A&M University. His research is two-fold. First, molecular-level understanding of the mechanisms of clay–organic interactions, having the long-term goal of developing functional clay-based materials that can serve as adsorbents for biotoxins and agricultural chemicals. Second, the description of structural defects in clay

minerals to understand the influence of such defects on the properties and functionalities of clay minerals. He uses UV–visible spectrometry to screen the efficiency of clays as sorbents and a combination of X-ray diffraction (XRD), infrared spectroscopy, and molecular dynamics to understand the bonding mechanisms of a given clay–organic complex. He also applies Rietveld refinement analysis to describe the type and abundance of defects in clay minerals.

CMS MEMBERSHIP RENEWAL

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QUICK UPDATES

- **CMS 57th Annual Meeting**
Pacific NW National Laboratory, Discovery Hall, Richland, WA, USA
15–19 June 2020
Information can be found at <http://www.clays.org/>
- **Research and Travel Grant Deadline** is 10 February 2020
- The 10th biennial **Reynolds Cup (2020) competition** for quantitative mineral analysis is now open.
Information at <http://www.clays.org/Reynolds.html>