# The Clay Minerals Society

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## THE PRESIDENT'S CORNER

Michael Velbel

In my previous (and last solo) President's Corner, I prepared to bid farewell. By the time you read this, my successor will have taken office. Crawford Elliott's first President's Corner follows. Thank you all for helping CMS thrive.

Best wishes,

**Michael Velbel** (velbel@msu.edu)
Past President, The Clay Minerals Society

W. Crawford Elliott

The CMS is a vibrant community of diverse scholars and scientists all interested in the fine-grained materials in rocks, soils, and synthetic products, including minerals as far away as the Martian surface. We heard about the latest efforts at our 51st Annual Meeting at Texas A&M University in May 2014. In addition to a technical session featuring diverse topics such as nanomaterials, clays and oil and gas, clays in soils, and spectroscopy and molecular simulations of clays (to name only a few), the meeting had an all-day technical workshop on the surface modification of clays and nanocomposites and three field trips visiting local soils, lignite mines, and Ca bentonites. We are fortunate to have a dedicated and committed membership contributing to improve our knowledge of these fine-grained minerals. This new knowledge reaches throughout the *Elements* family and to the broader scientific community. At this meeting, we thanked Michael Velbel for serving as president for the past year. As I start my term as president, to last until July 2015, I would like to thank Michael again on behalf of the CMS.

The CMS values being part of the *Elements* family. *Elements* and our journal *Clays and Clay Minerals* are our scientific voices to the larger scientific communities. We look forward to contributing to *Elements* and being part of the *Elements* family.

Best wishes,

**W. Crawford Elliott** (wcelliott@gsu.edu)
President, The Clay Minerals Society

## STUDENT RESEARCH SPOTLIGHT

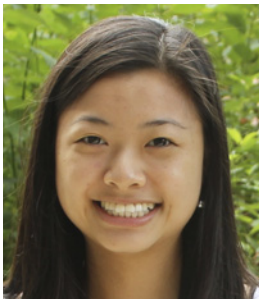
Erik Oerter

Congratulations to **Erik Oerter** (University of California at Berkeley) for winning a CMS Student Research Grant and to **Anke Hertam** (Freiberg University of Mining and Technology), **Florence Ling** (Pennsylvania State University), and **Austin Boles** (University of Michigan) for winning a CMS Student Travel Award!

Erik Oerter's research aims to elucidate the **role of clay minerals in influencing the isotopic composition of soil water**. Erik's research has shown that the exchangeable cations (Mg, Ca, K, Na) adsorbed on smectite clay minerals can significantly influence the isotopic composition of soil water. For example, in montmorillonite with 5% water content, adsorbed Mg and Ca cations deplete the $\delta^{18}O$ value of water by up to 1.55‰ relative to pure water, K ions enrich $\delta^{18}O$ by up to 0.86‰, and Na ions exert no effect. This adsorbed cation isotope effect has implications in studies of pedogenic carbonate, plant–soil water use, and soil–atmosphere interaction. Erik's Student Research Grant was accompanied by the Robert C. Reynolds, Jr. award for the best proposal received by CMS in 2013.

Anke Hertam

Anke Hertam is examining the **utility of lithium-bearing mica for the recovery of battery-grade lithium carbonate**. In particular, Anke is investigating correlations between the structural features and leachability of zinnwaldite, a Li-bearing mica from a deposit near the municipality of Zinnwald, Germany. Anke is applying a range of analytical methods (vibrational spectroscopy, MAS-NMR, powder XRD, SEM-EDX, and Mössbauer measurements) to characterize the effects of fluoride concentration and Fe(II) oxidation during dry thermal and hydrothermal treatments of zinnwaldite with various aqueous electrolyte solutions. Anke's presentation of her work at the 50th Annual Meeting of the CMS in 2013, for which she won the award for the best student poster presentation, was a highlight of her year and led to new connections with many clay scientists.



Florence Ling

Florence Ling's research aims to characterize the **uptake of lead by manganese oxides**. The cycling of lead in air, soil, and groundwater is an important societal concern because of its long-term neurological impact on children and the large number of sites contaminated by lead. Birnessite and other Mn oxides are known to exhibit a strong affinity for Pb, but the adsorption mechanism is not fully understood. Florence is using time-resolved X-ray diffraction in a series of flow-through experiments to characterize Pb uptake by hexagonal H-birnessite and triclinic Na-birnessite. Her results indicate that lead, in addition to adsorbing on the external surfaces, also enters the birnessite interlayers. This interlayer uptake takes place on timescales of days to weeks and is slower for hexagonal than for triclinic birnessite.

Austin Boles

Austin Boles' research includes the investigation of **neomineralized clays in continental fault zones**. Stable isotope analysis of clay minerals from gouge rocks of the San Andreas Fault (California, USA), the North Anatolian Fault (Turkey), and the Alpine Fault (New Zealand) is underway and promises to yield interesting data that may help identify mineralizing-fluid sources. Another project currently underway involves a test of the orogenic fluid-flow hypothesis, whereby hot basinal brines are extruded laterally from deep basins in response to mountain building. Again, the neomineralized clay phases are proposed to act as tracers of the orogenic fluid composition. These avenues of inquiry promise to lead to a better understanding of the fluid architecture of the upper crust.