



The Clay Minerals Society

www.clays.org

THE PRESIDENT'S CORNER



W. Crawford Elliott

As I write this, we are moving quickly through 2014, and 2015 is just around the corner. As I mentioned in the last CMS society page, we recently launched the new CMS e-newsletter. Thus far, we have sent two of these newsletters to CMS members and interested friends. If you would like to receive the newsletter, please visit the CMS web page (www.clays.org). We also have gone live with a Wikipedia page that will provide visibility to the CMS. This page will serve as a working document gathering many aspects of the CMS's history and accomplishments.

We look forward to promoting the good work being done in the CMS as well as highlighting articles in *Clays and Clay Minerals*.

One of the best things we do as a society is to sponsor student research and travel awards for the benefit of our student members. We congratulate all the recipients of our student awards and look forward to hearing about their future accomplishments. We highlight three of our recent awardees below. Additional information on the CMS student awards is available on the CMS home page.

Speaking of students, I am reminded by my students that 2014 is the International Year of Crystallography, as declared by the United Nations. Year 2014 is 102 years after the landmark work of generating and interpreting the first X-ray diffraction patterns. This work showed that X-rays are waves and that minerals are composed of a 3-dimensional lattice at the atomic scale. The 2014 International Year of Crystallography is a time to remember the importance of structural mineralogy and perhaps take time to read some of the early papers. I call your attention to the papers in the January 2012 and 2013 issues of *Acta Crystallographica* for some good background reading on the occasion of the centennial celebrations for Bragg and von Laue. We can marvel at what was done without laptops, computers, and other advanced techniques. It is also a time to encourage further research in this area. The next hundred years look to be promising, with new "lenses" for examining minerals and new regions beyond Earth to explore.

The CMS extends our best wishes for 2015 to all in the *Elements* family.

Sincerely,

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

52nd CMS ANNUAL MEETING

The 52nd CMS Annual Meeting will be held at Edinburgh University, July 5–10, 2015, jointly with the Euroclay2015 meeting of the European Clay Groups Association (ECGA) and in association with the International Natural Zeolite Association (INZA) and the Geological Society. Information can be found at www.euroclay2015.org.

2015 RENEWAL OF CMS MEMBERSHIP

Please remember to renew your membership at www.clays.org. The membership rate for 2015 is \$90 (\$35 for students).

STUDENT RESEARCH SPOTLIGHT

Congratulations to **Sabina Yeasmin** (University of Sydney) for winning a CMS Student Research Grant and to **Sandra Londoño** (Arizona State University) and **Jinhong Zhou** (Nanjing University) for winning CMS Student Travel Awards!



Sabina Yeasmin's research aims to elucidate the **adsorption of dissolved organic carbon (DOC) on soil minerals and its impact on DOC chemistry in soils**. Dissolved organic carbon, one of the most labile fractions of reactive carbon in soils, includes a range of organic carbon compounds with highly variable compositions and turnover rates. Although DOC represents only a small fraction of total soil organic carbon, its chemistry has important impacts on soil microbial activity, metal and

organic-pollutant transport, soil-forming processes, mineral weathering, and nutrient budgets. Mineral-organic matter interaction, especially adsorption processes, can strongly impact the composition and turnover rates of DOC. Sabina's research focuses on characterizing the influence of mineralogy and organic carbon-compound chemistry on the sorption and stabilization of DOC in soils.



Sandra Londoño is examining the **antibacterial properties of clays** using a combination of mineralogical, geochemical, and microbiological techniques. Despite the popularity of healing clays in natural and alternative medicines, only a few healing clays have well-established antibacterial properties. The mechanism of action is an active area of research; some studies have linked the antibacterial properties of clays to the toxicity of metal species that can produce oxidative damage to

bacterial cells. Sandra's research, carried out in the group of Dr. Lynda Williams, focuses on a natural antibacterial clay from Colombia (AMZ) that significantly reduces the survival of Gram-negative and Gram-positive bacteria. Results indicate that both the composition and the surface characteristics of AMZ play a role in impairing bacterial viability, suggesting that clays can fight pathogens both by chemical transfer and through surface-mediated reactions.



Jinhong Zhou's research aims to characterize the **interlayer surface properties of rectorite** at the microscopic scale using atomistic (Monte Carlo, molecular dynamics) simulations. Rectorite is a regular mixed-layer clay mineral containing smectite as its expandable fraction. Jinhong's simulations have shown that the hydration properties of rectorite are similar to those of the smectite montmorillonite (for example, the bilayer hydrate is more stable than the monolayer hydrate), but they also show

significant differences. In particular, the interlayer sodium ions in rectorite have an asymmetrical distribution different from that of montmorillonite. Jinhong also has employed atomistic simulations to investigate the interlayer structure and dynamics of organic-intercalated rectorite. Her results reveal that water has a strong influence on the distribution and dynamics of interlayer organic molecules. Molecular simulations of sepiolite and palygorskite are currently underway.