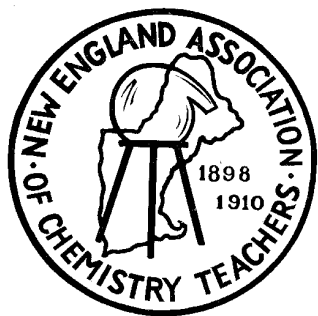




New England Association of Chemistry Teachers

76th Summer Conference

Clark University
950 Main Street
Worcester, MA 01610

Monday, August 10, 2015

Colorful Chemistry

76th Summer Conference Committee

Meledath Govindan, Chair

Mary Christian-Madden

Jerusha Vogel

Mark Turnbull

Kathy Siok, Registrar-Treasurer, Scholarships

Lorraine Kelly, Contact Hours/PDP

Short Program Descriptions:

9:15 – 10:15 am. Historic Mineral Pigments: Colorful Benchmarks of Ancient Civilizations.

Sr. Mary Virginia Orna, College of New Rochelle, New Rochelle, NY 10805

Our ancient forebears certainly made use of pigments to color virtually everything they used or had: bodies, caves, pottery, sculpture, stone structures, clothing and other textiles. This paper will document their usage with an emphasis on mineral pigments, natural and synthetic.

10:30 am – 12:00 Noon. Workshop. Infusing curricula with modeling: Explore and discuss a sample of Next Generation Science Standards (NGSS) inspired materials.

Daniel Damelin, Concord Consortium, Concord, MA

Modeling is a central practice that is part of the Next Generation Science Standards. Participants will explore a range of freely available simulations and see how some have been used in the context of a curriculum specifically designed to respond to the NGSS call for greater student engagement in scientific and engineering practices coupled with disciplinary core ideas and cross cutting concepts. Participants will share how they currently use similar tools, and the pedagogical considerations that go along with integrating these components in an online curriculum.

10:30 am – 12:00 Noon. Workshop. Mostly Purple Stuff

Sue Klemmer, Camden Hills Regional High School, Rockport, ME.

Color is a great way to capture students' attention. But what do you do with that attention once you've caught it? This workshop will feature some of my favorite demonstrations and labs that feature color as keys to show off and help explain the behavior of materials. We'll start with a short discussion of what I look for in a good demo or lab to promote students' actively thinking about what they are seeing, and how I weave "live events" into assessments. We'll spend the bulk of the time trying out a buffet of activities.

10:30 am – 12:00 Noon. Workshop. Quantum Dots: Colorful Chemistry in Teaching and Research

Gonghu Li, Department of Chemistry & Materials Science Program, University of New Hampshire

Quantum dots are semiconductor nanoparticles that are small enough to exhibit quantum mechanical properties. The optical absorption and emission properties of a quantum dot are often strongly dependent on its size and shape. In this lecture, we will introduce quantum size effect and discuss how quantum dots are incorporated in our physical chemistry curriculum at UNH. We will also present selected results on solar energy research using quantum dots.

1:00 – 2:00 pm. "Learning by Accident."

Dr. James Kaufman, Laboratory Safety Institute, Natick, MA.

For over 40 years, I've been interested in and concerned about laboratory accidents. I want to share with you what prompted my sudden interest after 25 years in school. What led me to believe that the accident rate in schools and colleges was 10-100 times greater than the chemical industry! The Laboratory Safety Institute's (LSI) lab accident collection includes over 5,000 examples drawn from more than 150 different types of labs in over 30 countries. I'm going to share lots of examples including some from Clark University and WPI. And, I'm going to include a couple of examples to illustrate the point that we sometimes don't know what we don't know.

1:00 – 2:00 pm. Physics in Art: Using Optics and Modern Physics to Analyze Art Objects.

Frank Lamelas and Sudha Swaminathan, Worcester State University, Worcester, MA 01602

We have developed an introductory lab course where we show how physical methods can be used to study art objects.

2:30 – 4:30 pm. Physics Tour of the Worcester Art Museum. Participants should drive themselves to the Museum or carpool with others.

Sudha Swaminathan and Frank Lamelas, Worcester State University, Worcester, MA.

Analytical techniques based on physical principles are widely used in art conservation. Most students have favorable impressions of museums and art objects. Therefore, describing scientific analyses of art is one way of introducing students to the fundamental science underlying the analyses.

2:00 – 3:30 pm. Designing Formative Assessments for Performance Expectations as Expressed in the NGSS.

Daniel Damelin, Concord Consortium, Concord, MA.

The Next Generation Science Standards represent a shift toward performance expectations. Developing assessments for student performance is challenging. Participants in this workshop will share current efforts and learn about a principled process for developing formative assessments to gauge student progress toward achieving mastery of these kinds of goals.

4:00 – 5:30 pm. Workshop: Colorful Chemistry with Glucose Oxidation.

Dr. Mathangi Krishnamurthy, Department of Biology and Chemistry, Fitchburg State University.

This experiment is a demonstration of a simple redox reaction. Glucose is a reducing agent, which in an alkaline solution will reduce methylene blue, a redox indicator, to its colorless form. color changes when they cycle between their reduced and oxidized states.

4:00 -5:30 pm. Workshop: The Colorful Chemistry of Semi-Precious Gems & Minerals.

Mary Christian-Madden, Immediate Past-President and Curator, NEACT, East Greenwich, Rhode Island 02818.

7:30 – 8:30 pm. Fashion, Pharmaceuticals, Food, and Fun: The Chemical History of Color

Sr. Mary Virginia Orna, Professor of Chemistry, College of New Rochelle, NY.

Color has been an exciting and enjoyable part of human life ever since the color-sensitive eye evolved over a million years ago. However, the junction between color and chemistry, and color and history, is of more recent origin. This talk traces the history of color usage as a chemical endeavor from the earliest records to the present day focusing on four major areas: fashion, pharmaceuticals, food, and fun. It is a trajectory peppered with stories to help us understand the mystery of color as a universal experience and phenomenon; its chemical history, as you shall see, is no less so. This talk is based on her recent book, “The Chemical History of Color” (Springer, 2013)

