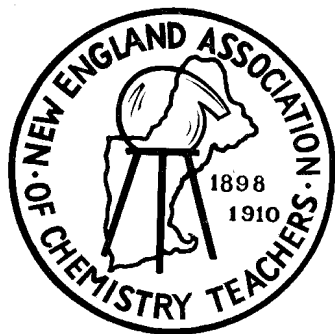


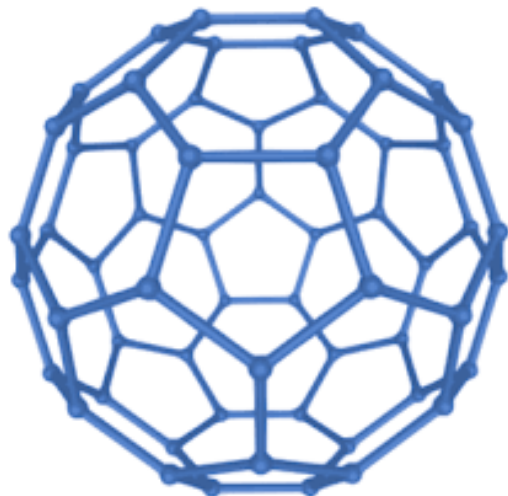
New England Association of Chemistry Teachers



78th Summer Conference

Fitchburg State University

Friday, July 14, 2017



Materials Chemistry

78th Summer Conference Committee

Meledath Govindan & Bobbie Lamont, Co-Chairs

Kathy Siok, Registrar-Treasurer, Scholarships

Donna Trainor, Contact Hours/PDP

General Information for Participants

- **Conference Site Information**

- Fitchburg State University, Randall Science Lecture Hall, Antonucci Science Complex
- Address: 333 North Street, Fitchburg, MA 01420.

- **Directions:** For general directions to FSU, please see the the University's website: <http://www.fitchburgstate.edu/aboutus/directions/>
- Take Interstate 91, 190 or 495 to Rte. 2 to the Rte. 12 North exit (31B). Travel north on Route 12 for 2.8 miles, then turn right immediately after Enterprise Car Rental. After crossing the bridge turn right again on Main St. Take the second left onto North Street (at the Dunkin' Donuts).
- Parking: **Ross Street lot (#11 in the Campus Parking map)**. Drive past the tall green chimney and the Science Complex immediately after that. The parking lot is after all the buildings at the corner of North St. and Ross St. Turn right on Ross St. and you will see the entrance to the lot immediately to the left. Park, walk out, return to North St. and walk back to the Science Complex. Enter the building and walk to the second floor. There will be signs for the Lecture Hall.
- *If you use Google maps or GPS, you can search for Ross Street Parking at Fitchburg State University, Fitchburg, MA. This will take you to the parking lot. You are also allowed park in the Weston parking lots on North Street. Campus Map: <http://www.fsc.edu/aboutus/directions/campusmap2d.pdf>*

Hotel Accommodation for July 13th and/or 14th. For those who would like to stay overnight, rooms have been blocked (**Group Name: NE Association of Chemistry Teachers**) at the **Double Tree Hilton, 99 Erdman Way, Leominster, Massachusetts, 01453 for the group rate of \$110 including breakfast (single or double occupancy).** **Reservation must be made by July 7th in order to guarantee this rate; so book early.**

Booking Link:

https://secure3.hilton.com/en_US/dt/reservation/book.htm?inputModule=HOTEL&ctyhocn=ORHLEDT&spec_plan=CDTFCT&arrival=20170713&departure=20170714&cid=OM,WW,HILTONLINK,EN,DirectLink&fromId=HILTONLINKDIRECT

You may also call the hotel at 978-534-9000 and ask for NE Association of Chemistry Teachers conference rate.

- *Sign-up for workshops at the time you check-in.*
- *To receive Contact Hours/PDP you should see Dr. Donna Trainor at the time of check-in at the conference.*

Financial Aid is available thanks to the generosity of our local ACS sections (Northeastern, Central Massachusetts, Rhode Island). Please contact Kathy Siok (kathys5@cox.net) to be considered. Indicate your school, years and courses taught, and some detail about why you are asking for aid.

New England Association of Chemistry Teachers 78th Summer Conference Schedule Friday, July 14, 2017 Fitchburg State University
All sessions except the banquet will be held in the Robert and Jeanne Antonucci Science Center.

8:30 AM	Arrival, Registration, light breakfast Fiorentino Foyer		
9:00-9:15	Welcome Greetings: Randall Science Lecture Hall (SCI 211) Bobbie Lamont , President, NEACT Dr. Meledath Govindan , Professor of Chemistry, Fitchburg University, Immediate Past-President, NEACT Dr. Alberto Cardelle , Provost and Vice President for Academic Affairs, Fitchburg State University		
9:15 -10:00	Mary Madden , Quinebaug Community College, Danielson, CT Really Neat New Compounds		
10:15 -11:45	Dr. Robert Langer , David H. Koch Institute Professor, Massachusetts Institute of Technology, Cambridge, MA "Biomaterials and Biotechnology"		
11:45	NEACT Annual Recessed Meeting		
12:00	Lunch (Liscotti Pavilion)		
1:00 - 2:00	Dr. Maqsood Mughal , Fitchburg State University, MA "Thin Film Semiconductors for Solar Cell Applications"		
2:15 - 3:45	Workshop 1 (SCI 304) Sharon Geyer , Woodstock Academy, CT Stoichiometry Application: ID of An Unknown Metal Carbonate	Workshop 2 (SCI 218) Esther Hines , Billerica High School, MA Solid State in High School	Workshop 3 (SCI 242) Dr. Hanan Mogawer , The Prout School, RI Art Integration In Materials Science
3:45 - 4:00	Afternoon Coffee		
4:00 - 5:30	Workshop 4 (SCI 304) Chris Koutros , Oliver Ames High School, MA Materials Chemistry: Quick and Easy Labs and Demos	Workshop 5 (SCI 303) Dr. Mark Turnbull , Clark University, Worcester, MA Materials Properties Demonstrations for All Ages	Workshop 6 (SCI 308) Patricia Rinaldi, Jim Lucey , Wilton High School, CT Whiteboarding, Stoichiometry and the "Clue Game"
5:30	Conference Photo: TBA		
6:00	Reception with Cash Bar (Falcon Hub, Hammond Hall)		
6:30	Buffet Dinner		
8:00	Speaker -Dr. Peter Trefonas , Corporate Fellow, Electronic Materials, Dow Chemical Co., Marlborough, MA "Enabling the Information Age with Chemistry"		

Program Descriptions

9:15 – 10:15 am. Mary Madden, Quinebaug Valley Community College, CT
"Really Neat New Compounds"

This presentation will feature a sample of recently synthesized compounds and alloys including a new double helix; a chromium complex containing single, double, and triple metal-ligand bonds; a unique gallium alloy; the world's strongest chemical base, and more! Some examples have great potential, practical use, while others are for our edification and use when teaching concepts such as polarity, hydrogen bonding, and structure of molecules.

Mary C. Madden is a veteran teacher who has spent her entire career in public education, teaching chemistry, physics, and astronomy at the high school level(27 years); high school principal(10 years); and for the past 10 years teaching general chemistry at the community college level. She has been NEACT's Southern Division Chair, Recording Secretary, and President. She currently serves as NEACT's Curator of Archives. She loves her family, teaching, chemistry, and she is interested in a mole of pursuits!

10:30 am – 11:45. Dr Robert Langer, David H. Koch Institute Professor, Massachusetts Institute of Technology, Cambridge, MA
"Biomaterials and Biotechnology"

Overview of a career in chemical engineering as applied to (mostly) medical problems. The chemistry of biodegradable polymers and tissue engineering will be discussed in the context of the role of teachers and mentors in the collaborative invention process.

Robert S. Langer is the David H. Koch Institute Professor. Dr. Langer has written nearly 1,380 articles. He also has over 1,130 issued and pending patents worldwide. Dr. Langer's patents have been licensed or sublicensed to over 300 pharmaceutical, chemical, biotechnology and medical device companies. He is the most cited engineer in history.

1:00 – 2:00. Dr. Maqsood Mughal, Assistant Professor, Fitchburg State University, MA.

“Thin Film Semiconductors for Solar Cell Applications”

The process of converting sunlight directly into electrical energy using the optoelectronic properties of a suitable semiconductor material is an elegant energy conversion process. A thin film solar cell (TFSC) is a second generation solar cell that is made by depositing one or more thin layers of a semiconductor material using a diverse variety of deposition techniques on various types of substrates (flexible, rigid, metal, etc.) and with diverse morphologies. TFSC technology has developed within the last decade from merely concepts to a full-fledged industry. This presentation will provide attendees the opportunity to help introduce students in high school and introductory college courses to the fundamentals of solar cells, their structure and components, and how this renewable energy technology is globally transforming our planet into one green healthy planet.

Maqsood Ali Mughal is currently an Assistant Professor of Electronics Engineering Technology at Fitchburg State University. Previously, he worked as a faculty in College of Engineering at Arkansas State University. He holds M.S. degrees in Engineering Management and Environmental Sciences. In 2015, he received his Ph.D. degree in Environmental Sciences at Arkansas State University with doctoral research focusing upon novel semiconductor materials (like CdTe, In_2S_3 , and CuInS_2) for photovoltaic applications.

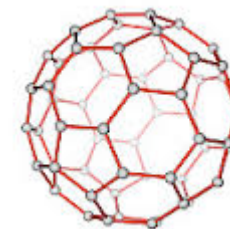
2:15 - 2:45 pm. Workshops

Workshop 1

Sharon Geyer, Woodstock Academy, Woodstock, CT

“Stoichiometry Application: ID of an Unknown Metal Carbonate”

Here is a quick and fun lab activity that uses stoichiometry to identify an unknown substance. Starting with a sample of either sodium carbonate or sodium bicarbonate, students can use the stoichiometric relationship from a balanced chemical equation to determine the identity of their unknown. Both substances react with hydrochloric acid to produce aqueous sodium chloride, carbon dioxide, and water. By collecting the NaCl product, the ID of the unknown is revealed using the mole ratio.



Sharon Geyer is NEACT's Western Division Chair; she hosts our December meeting. Sharon is a triathlete, a weaver/knitter, a wife, a mother to three boys, and an exceptional chemistry blogger. Her site, "The Art of Teaching Science: Exploring chemistry in a high school science classroom" is a handy, quick, richly detailed source for teachers. Her last entry, earlier this year, showed how to combine wintry weather with colligative properties instruction.

Workshop 2 **Esther Hines, Billerica High School, Billerica, MA**
"Solid State in a High School Classroom"

Solid State is currently studied as part of State of Matter chapter at our first year high school chemistry course. It is seen briefly again by second year chemistry students (AP Chemistry) in more detail. Still, solid state is a topic that falls outside the "standard" chemistry curriculum, yet it is the introduction to material science. Material science as a career has evolved to become fundamental in research and industry with majors in chemistry, physics and engineering. This presentation will give attendees the opportunity to help introduce students in high school to the fundamentals of solid state, through lecture notes and hands on activities (using two and three dimensional models) to help in the understanding of solid structure. Attendees will get electronic copies of the lecture notes and lab activities handouts and a list of more resources available online.

Ms. Hines is currently a chemistry teacher at Billerica Memorial High School where she teaches Chemistry to 10th, 11th and 12th grade students. This is her 11th year at BMHS. Prior to this she had the opportunity to teach General Chemistry and Physical Chemistry at the University of North Carolina (Pembroke), and General Chemistry to military service members attending University of Maryland and City College of Chicago at their European campuses in Italy. She holds an undergraduate degree in Chemistry from Catholic University of Peru, and Master's degree in Chemistry from the University of New Hampshire, Durham NH.

Workshop 3 **Dr. Hanan Mogawer, The Prout School, RI**
"Art Integration In Materials Science "

Participants will be using their knowledge of materials science and engineering to design and to create artful products, they will be following the Engineering Design Cycle that follows NGSS footsteps. We may know that copper is a conductive metal, but can we integrate this knowledge into a piece of art? Art integration into materials science and engineering curriculum help to bridge the gap between theories and applications. Students will be engaged and interested in the learning process. In this workshop, participants will understand the struggle that our high school students may face at the first glance of any assigned project, but with following the Engineering Design Cycle, and by making mistakes, they will be able to reflect on their products and improve them.

Hanan Mogawer hold Masters and Ph.D in Chemical Engineering from University of Rhode Island and recently she earned her MA in Teaching from Brown University. She is the STEAM coordinator at Prout School. She designed and created a new course at the high school level entitled, " Materials Science and Engineering ", in which students follow the Engineering Design Cycle and also integrate art into their designs which adds meaning to students' final products. She is also an adjunct at Salve Regina University in Newport.

4:00 - 5:30 PM Workshops

Workshop 4

Chris Koutros, Oliver Ames High School, Easton, MA

"Materials Chemistry: Quick and Easy Labs and Demos"

The function of materials depends on the molecular-level structures inside them. This workshop focuses on classroom demos and labs that teach the NGSS chemistry standards revolving around materials science. Properties of polymers, metals, ionic and molecular substances will be covered. Attendees will complete the experiments and leave with ideas for how students can use technology to communicate their understanding about the chemistry of materials.

Chris Koutros is a chemistry teacher at Oliver Ames High School in Easton, Massachusetts. He earned his Bachelor's Degree in Philosophy at the College of the Holy Cross and a Masters in Chemistry at the University of Massachusetts Boston. He expects to earn a second Master's degree in Instructional Technology in December 2017. Chris' academic interests include POGIL, flipped classroom, integrating technology in the classroom, and interdisciplinary connections between sciences. Chris enjoys skiing, sailing, and hiking with his black lab, Beaker. He is NEACT's Southern Division Chair and responsible for the March meeting.

Workshop 5

Dr. Mark Turnbull, Clark University, Worcester, MA

"Materials Properties Demonstrations for All Ages"

With hopes of having as much fun as learning, we will work our way through a number of fairly simple demonstrations of materials properties, ranging from surface tension to magnetism, that can be adapted for use for most age groups (elementary school to age 'n'). Prior experience not required, but an ability to say "Oooh, ahhhh" even if you have seen it before is an asset.

Dr. Turnbull has been a Professor of Chemistry at Clark University since 1986 and also serves as the co-editor of the Journal of Coordination Chemistry. He was 2016 winner of NEACT's John A. Timm award for excellence in chemistry teaching and for making significant contributions to chemistry education during his career.

Workshop 6 **Patricia Rinaldi and Jim Lucey, Wilton High School, Wilton, CT**
"Whiteboarding, Stoichiometry and the 'Clue Game' "

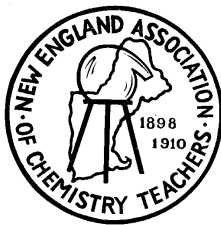
We teach chemistry by using the chemistry modeling method.. The core stoichiometric reasoning is structured around the balanced equation via an organizational table called the BCA table ("Before -Change-After"). This is not just another algorithmic. The BCA table is a tool that leads students to think through the reaction process and identify what is present before the reaction, what changes during the reaction (stoichiometry), and what is present after the reaction. This formula leads nicely into the ICE tables of AP Chemistry. We finish the stoichiometry unit with an application of concepts in our original "Clue Game", which you will be able to participate in during the workshop. Our students love this project and we hope you will too!

Patricia Rinaldi and Jim Lucey are chemistry teachers at Wilton High School in Connecticut. Patricia has taught for over 25 years in both public and private schools in Italy, Massachusetts and Connecticut. She will be presenting more modeling workshops at Chem Ed 2017 this summer.

8:00 pm. Dr. Peter Trefonas, Corporate Fellow, Electronic Materials, Dow Chemical Co., Marlborough
"Enabling the Information Age with Chemistry"

We are fortunate to live in a magical time which has seen the transitioning from the Industrial Age into the Information Age. This would not have happened without the many advances in chemistry and our quest to use novel materials, which enables electronics manufacture that drives innovation cycles. Chemists, material scientists and chemical engineers have been at the forefront of this societal and technological revolution. I will describe research at Dow Electronics Material Company which has led to enabling materials in this field, and finish with a discussion of some of our latest research results.

Dr. Trefonas is a Corporate Fellow in The Dow Chemical Company, where he works within the Dow Electronic Materials Business Group. He made major contributions to the development of many successful Dow products which are used in the production of integrated circuits spanning multiple device design generations from 2 micron to 16 nm node technologies. These products have been used in the manufacture of many generations of electronic items. Peter was recently awarded the 2016 Perkin Medal for outstanding contributions to industrial chemistry, the 2014 ACS Heroes of Chemistry Award and the 2014 SPIE Willson Award. He earned his PhD in Inorganic Chemistry with Prof. Robert West at the University of Wisconsin-Madison in 1985, and his BS in Chemistry at the University of New Orleans in 1980.



Registration Form

NEACT 2017 Summer Conference

"Materials Chemistry"

Fitchburg State University, Massachusetts

July 14, 2017

Name _____

Address _____ City, State _____ Zip _____

Home phone # (____) _____ Cell # (____) _____ e-mail _____

School Affiliation _____

Best way to reach you after July 1st _____

Emergency Contact: *Name, phone number and relationship to you*

Spouse and/or Guest attending: _____

Membership dues may be paid (separate check) when you registration at the conference.

Please CHECK if you are you applying for financial aid _____

Full Conference Fee includes: registration, program/sessions, workshops, contact hours, handouts, lunch, breaks, evening dinner + speaker

Full Conference Fee (includes evening dinner)= \$75.00 \$ _____

One Day Program (includes lunch) = \$50.00 \$ _____

Evening Dinner (enter extra people attending) = # ____ @\$25.00 \$ _____

Total Enclosed \$ _____

Please reserve your place by June 30th.

Refunds cannot be guaranteed for cancellations received after June 30th

Make checks payable to: **76th NEACT Summer Conference**
Mail with this form to: **Kathleen Siok, Registrar-Treasurer**
86 Spring Road North Kingstown, R.I. 02852

Questions? Call or e-mail Kathy at: 401-885-1608 or kathys5@cox.net.

If you require lodging, you will need to make your own arrangements. Please see brochure for more information.