New England Association of Chemistry Teachers

NEACT Conference Program

80th Annual Summer Conference  |  July 29-31, 2019
Middlesex School, Concord MA

NEACT President  Kristen VanderVeen
Immediate Past President  Barbara Lamont
Conference Committee  Kathy Siok
                      Chris Koutros
                      Bobbie Lamont

Program subject to change. Check neact.org for the latest version.

#IYPT 2019 — Celebrate the International Year of the Periodic Table (1869–2019)
About NEACT

The New England Association of Chemistry Teachers was founded in 1898 by a group of high school and college teachers meeting at Malden, MA High School, and incorporated in Massachusetts in 1910. Today its membership also includes middle school teachers, administrators, and industrial associates interested in chemical education. The aim of NEACT is to promote the teaching and learning of chemistry.

The annual summer conference is the highlight of the year's activities. In addition, four meetings are held during the school year, one in each geographical division around New England. These meetings include professional development workshops and cover recent developments in chemical education, research, and industry. NEACT also sponsors the John A. Timm award to recognize persons who have made noteworthy contributions toward education in chemistry.

NEACT is a 501(c)(3) Massachusetts non-profit corporation and a PDP and CEU professional development provider.
Registration Information

Register for the conference at our web site: neact.org

The conference fee includes registration and t-shirt, program sessions, workshops, contact hours (PDPs/CEUs), handouts, lunch, and coffee breaks.

All attendees must be NEACT members, either by renewing their current memberships or taking advantage of complimentary first-year membership for new members.

Conference Cost

- $150  Full three day conference, including Monday dinner and Tuesday Timm Banquet
- $100  Full three day conference (no dinners)
- $55   One day conference registration (no dinner)
- $50   Undergraduate student full three day conference (no dinner)

Some additional options are available on the neact.org web site.
Contact Kathy Siok at kathys5@cox.net with questions.

Payment can be made by mail (check or school PO) or by credit card or ACH debit using PayPal. Checks (made out to NEACT Summer Conference) should be mailed to: Kathy Siok, 86 Spring Road, North Kingstown, RI 02852.

Scholarships are available for conference registration expenses only. Accommodations, travel and supplies are not included. Contact Kathy if you are interested.
2019 NEACT Summer Conference Program

Conference Location

The NEACT Executive Board is grateful that Middlesex School is hosting our summer conference for a second consecutive year. An independent boarding school in Concord, Massachusetts, Middlesex School offers beautiful facilities and a welcoming atmosphere for our conference.

The state of the art, recently renovated Rachel Carson Center is the focal point for the conference, including for plenary lectures, workshops, and lunch. The Carson Center is a short walk from ample parking. Labs and dinner take place in adjacent buildings.

Driving directions

Middlesex School is located at 1400 Lowell Road, Concord, MA 01742 (Google Maps link)
After driving through Concord center, pass the school on the right and take the last (third) gate. Written directions available at bit.ly/mxschooldirect
Acknowledgements

Thank you to the people and organizations that helped make this conference a reality:

The National Science Teaching Association district representative, Carolyn Higgins

*Thank you also to our outstanding presenters and to you for attending!*

Element and subatomic particle spellings above courtesy of chemspeller.com
Participant Information

Accommodations

Accommodations are available at your own expense. Several hotels are nearby, including: Concord Colonial Inn (historic hotel), Marriott Residence Inn in Westford and Best Western in Concord.

Workshops and Field Trips

Sign-up for workshops will be on a first-come, first-served basis at registration time. Most offerings will be limited to 20 participants because of the size of the room. Field Trip sign-ups will also be available at registration. Transportation will be by private vehicle.

Technology

Bring your own laptops and devices. Guest Wifi is available. A number of the workshops and sessions involve internet use.

Swap Table

A Swap Table will be set up for sharing items that you bring. Note that the space is limited. Please contact Kathy Siok (kathys5@cox.net) if you are interested. Please note that you will be asked to remove any leftover materials that you bring.

NSTA publications will be available during the conference.

Professional Development Hours

NEACT is a registered Professional Development Provider through the Massachusetts Department of Elementary and Secondary Education. CEUs, PDPs, or Professional Development Hours are offered for teachers from Connecticut, Massachusetts and Rhode Island. Certificates of attendance and Payment information are available upon request.

Deborah Blum Book Signing

We anticipate that Deborah Blum will be available for a book signing immediately following her keynote. Bring your own copies. A limited number of her books will be available for purchase from NEACT.
Conference Schedule

Monday July 29th

8:30 - 9:30   Registration, Coffee and Refreshments     Rachel Carson Center Atrium
Sign up for workshops and field trips. Workshops generally have a cap of 20 attendees unless otherwise noted.

9:30               Welcome                       Danoff Recital Hall

10:00              Keynote Speaker: Deborah Blum     Danoff Recital Hall

Deborah Blum
Director of the Knight Science Journalism Program at MIT
Pulitzer Prize winner, author of The Poisoner's Handbook and The Poison Squad
Lecture followed by book signing opportunity.

11:20 - 12:45   Workshop Sessions (limit of 20 participants at each)     Posted Locations

Workshop descriptions and presenter biographies are in the conference program guide.

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<thead>
<tr>
<th>Figuring Periodic Trends Activity</th>
<th>Making Chemistry the Best Class of the Day for your Students</th>
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<td>Woodstock Academy</td>
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<td>Greater Lowell Technical High School</td>
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2019 NEACT Summer Conference Program

Monday July 29th

12:45 - 1:30 Lunch  Rachel Carson Center Atrium
Please note dietary restrictions during registration or by email ASAP to kathys5@cox.net

1:45 - 3:15 Workshop Sessions (limit of 20 participants at each)
Posted Locations

<table>
<thead>
<tr>
<th>Waters Corporation Presentation</th>
<th>Another Look at the Mystery of Matter</th>
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<td>Susan Klemmer</td>
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<td>Camden Hills Regional High School</td>
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| Helping students solve problems in a cooperative learning format while addressing issues with chem-math |
| W Cary Kilner |
| University of New Hampshire, ret. |

| Adios Abstract DisArray: Hello Hands-on Help |
| Elizabeth Stewart Miranda |
| Greater Lowell Technical High School |

3:30 - 5:00 Workshop Sessions (limit of 20 participants at each)
Posted Locations

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<th>Streamlining Classroom Workflows</th>
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| Connecting with your students |
| Chuck McDonald |
| Middlesex School |

| Green Chemistry Design: Recycling Polyactic Acid in the High School Lab |
| Beyond Benign |

5:00 - 5:15 NEACT Annual Meeting  Danoff Recital Hall

5:30 - 6:45 Dinner  Ware Hall Dining Hall

7:00 - 9:00 Showing of PBS American Experience: Poisoner’s Handbook  Danoff Recital Hall

9:00 Observatory (weather permitting)
Tuesday July 30th

8:15 - 9:00  Registration and Light Breakfast  Rachel Carson Center Atrium

8:45 - 11:30  Cabot Corporation Field Trip  Meet at Rachel Carson Center Atrium
For participants who signed up at registration. Transportation by private vehicle.

All Day  Beyond Benign will have an information table with resources  Rachel Carson Center Atrium

9:00 - 9:50  Plenary Lecture: Arjun Bir  Danoff Recital Hall

Arjun Bir
Oasis Water Technologies

Georgia Tech Civil Engineering graduate, Winner of the 2018 MIT Water Innovation Prize for developing a low cost method to test for levels of *E. Coli* in drinking water.

10:00 - 11:30  Workshop Sessions (limit of 20 participants at each)  Posted Locations

<table>
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<tr>
<th>Water Testing Workshop</th>
<th>Enhancing Student Inquiry in the Chemistry Classroom</th>
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<td><em>Oasis Water Technologies</em></td>
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<td><em>Boston Public Schools</em></td>
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11:30 - 12:15  Lunch  Rachel Carson Center Atrium
Please note dietary restrictions during registration or by email ASAP to kathys5@cox.net

12:30 - 2:00  Workshop Sessions (limit of 20 participants at each)  Posted Locations

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<tr>
<th>Lessons Learned from the 100th Anniversary of the Periodic Table</th>
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<td><em>Natick High School, ret.</em></td>
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<td>Danoff Recital Hall</td>
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Tuesday July 30th

2:10 - 5:15 “Chem Camp” Unconference Sessions

NEACT’s hybrid unconference session returns this year after a very successful debut at the 2018 summer conference.

Bring your ideas for the topics you really want to talk about with other chemistry teachers. Share those topics and pick a slot. Other attendees who are interested in the same topic will come! There’s no need to prepare ahead of time. Attendees will share out their session notes and highlights at the end.

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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| 2:10  | Introduction to “Chem Camp” and Unconferences  Sharon Geyer  
Woodstock Academy  | Danoff Recital Hall       |
| 2:30  | Session 1 in posted locations  |                           |
| 3:10  | Session 2 in posted locations  |                           |
| 3:50  | Session 3 in posted locations  |                           |
| 4:30  | Recap and Group Sharing       | Danoff Recital Hall       |
| 5:15  | Group Photo                   | Danoff Recital Hall       |
| 5:30  | Timm Award Reception          | Ware Hall Dining Hall     |
|       | Beer and wine will be available as we gather to celebrate our award recipient. |
| 6:00  | Timm Award Banquet            | Ware Hall Dining Hall     |
| 7:15  | Timm Award Presentation and Address  | Danoff Recital Hall       |
| 9:00  | Observatory (weather permitting) |                           |
Wednesday July 31st

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<tr>
<td>8:15 - 9:00</td>
<td>Registration and Light Breakfast</td>
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<tr>
<td>9:00 - 9:10</td>
<td>Conference Announcements</td>
<td>Danoff Recital Hall</td>
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<td>9:15 - 10:45</td>
<td>Workshop Sessions (limit of 20 participants at each)</td>
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<td>Redefining the &quot;Front of the Room&quot;</td>
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<td>Charles McDonald</td>
<td><em>Middlesex School</em></td>
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<td>Trading Tips on Element Labs</td>
<td><em>Camden Hills Regional High School</em></td>
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<td>A High School Organic Chemistry Course</td>
<td><em>Loomis Chaffee School</em></td>
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<td>Koby Osei-Mensah</td>
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<td>Periodic Table Puzzlers</td>
<td>Mystery Chemist TBA</td>
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<tr>
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<td>Supporting Abstract Learning with Simulations</td>
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<td>Emily Allen</td>
<td><em>Governor's Academy</em></td>
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<td>Elements, cpds and a vocabulary card sort</td>
<td><em>Norfolk County Agricultural High School</em></td>
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<td></td>
<td>Customizing Your Periodic Table</td>
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<tr>
<td></td>
<td>Chris Koutros</td>
<td><em>Oliver Ames High School</em></td>
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<td>PT games. Applying NGSS crosscutting</td>
<td><em>Greenwich High School</em></td>
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<td>Concepts of Patterns</td>
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<td>Jerusha Vogel</td>
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<tr>
<td>12:30 - 1:30</td>
<td>Lunch, Wrap-up, and Raffles</td>
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<td>1:30 - 3:30</td>
<td>True West Brewery Field Trip</td>
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“There is something infinitely healing in the repeated refrains of nature - the assurance that dawn comes after night, and spring after winter.”

-Rachel Carson
Monday Sessions

7/29 11:20 - 12:45 Workshop Sessions

Making Chemistry the Best Class of the Day for your students
Sharon Geyer, Woodstock Academy

"Here are some of the ways I make chemistry the best part of a student's day, even on non-lab days". With over 20 years of teaching experience, Sharon Geyer would like to share their most engaging class activities and daily openers. We all know that chemistry is best learned by doing. You will have the chance to try out card sorting for nomenclature, the development of the atomic model, writing ionic formulas, chemical and physical change, and several other important concepts in first year chemistry. You will leave with resources for new activities that you can implement immediately into your classes next year.

Adios Abstract DisArray: Hello Hands-on Help
Elizabeth Stewart Miranda, Greater Lowell Technical High School

Making Chemistry easy for a generalized science student is sometimes a difficult task to master, but it can be achieved with the use of a variety of types of hands-on activities, multi-modal and literacy tools. By implementing curriculum ideas traditionally meant for more specialized learning populations in the generalized classroom, generalized students have an easier time acquiring new material and perform better on a variety of assessments. Methodologies include multi-modal approaches, implementing scaffolding activities, using a variety of assessment styles, and using literacy tools in the classroom. This workshop will focus on multi-modal hands-on activities and the use of literacy tools in the Chemistry classroom.

Liz Stewart-Miranda has a B.A. in Anthropology from Tufts University and an M.S. in Archaeology from the University of New Mexico. Working briefly as an Archaeologist. She has since used her random knowledge background to become a Biology and Chemistry instructor. She spent 10 years at Greater Lawrence Technical School and recently become employed at Greater Lowell Technical School in January, 2019.

Figuring Periodic Trends Activity
Esther Hines, Billerica High School

This workshop includes a 10 minute video on Mendeleev, and a hands-on activity

Esther Hines is a chemistry teacher at Billerica Memorial High School, she teaches college preparatory, Honors, Advanced Placement and Organic Chemistry. Mrs. Hines holds a BS and MS in Chemistry.
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Murderous Intent? Poisoning in 1730s Newport
Mary Madden, ret.

Newport was a thriving Rhode Island port by the mid-18th century, but it was far from a healthy environment. Chemicals in foods, medicines/drugs often resulted in early death. Some deaths were of dubious origin. Participants at this interactive presentation may take on various roles: an apothecary, a doctor, a merchant, a cuckold, a wife, a liaison, or a judge. After reviewing the historical trends of consumerism, counterfeiting, marital infidelity, greed, law, news reporting, trials, and gossip rampant in Newport, and recognizing the chemicals commonly used during this time, participants will use CER (Claim-Evidence-Reasons) to conclude whether the death of Benedict Arnold (not the infamous traitor) was by murder or by natural progression of his diseases.

Mary Madden’s career spanned 47 years in public education as a chemistry, astronomy, and physics teacher in North Providence and Exeter-West Greenwich, Rhode Island. She was a high school principal in Rhode Island and in Connecticut during 14 years, followed by ten years as a General Chemistry I and II Instructor at Quinebaug Valley Community College. The recipient of several state, regional and national awards for excellence in chemistry teaching, Mary continues to teach...through experiments with her younger grandchildren and by reviewing concepts with a grandson before each of his high school exams. Mary is NEACT Curator of Archives and a past-President, Secretary, and Southern Division Chair.

7/29 1:45 - 3:15 Workshop Sessions

Waters Corporation Presentation

Presentation description will be posted soon. Check neact.org for the latest version of this program.

Another Look at the Mystery of Matter
Susan Klemmer, Camden Hills Regional High School

*The Mystery of Matter: Search for the Elements* is a wonderful PBS multimedia re-enactment of key moments of the human history of the Periodic Table, surrounded by a host of other resources. It premiered online in 2015, but project director Stephen Lyons enlisted the help of NEACT members over two prior summers to screen drafts and provide feedback. On this Year of The Periodic Table I invite those who have never seen this program, as well as those who want to revisit a resource they may have put on the back burner, to walk with me through all the facets of this project and how some of our members have incorporated videos, video clips, and text resources into their curricula.

Sue Klemmer teaches chemistry and physics at Camden Hills Regional High School on the coast of Maine. She is the chair of the Northern Division of NEACT, covering ME, NH and VT and promises that she is finally ready to start holding online “ChemChats” via Zoom to bring our scattered and often isolated members together with each other and the rest of NEACT. She holds a BA in Chemistry from Wesleyan University, and hopes to someday finish her research on how college and high school students use particulate models to solve conceptual problems so she can get her MS in Science Education. In the meantime she keeps working on particulate modeling, the use of historical examples and data in
developing conceptual understanding of core chemistry ideas, and her favorite tools for science literacy: concept mapping and Gowin’s Vee.

**Helping students solve problems in a cooperative learning format while addressing issues with chem-math**

W. Cary Kilner, University of New Hampshire, ret.

After teaching for 23 years in HS, I used my evolved pedagogy, The Chem-Math Project, in my graduate studies at UNH. I demonstrated to incoming chemistry graduate students how to run a successful recitation class in problem-solving. One year, I ran the PLTL program for my advisor who was on sabbatical. I provided example problems for the PLTL leaders to use with their students and gave them selected readings from CER (chemical education research). I also ran recitation classes for under-prepared and at-risk student in general chemistry.

In this workshop, I shall provide selected exercises, problems, and proofs and derivations that you may find useful in your teaching. You will work in groups of three and I shall walk around and provide guidance as needed. We will begin with some simpler mathematics, physical-science, and chemistry problems that establish basic skills, and then move on to more interesting problems in areas of your choice such as gas-laws, atomic theory, stoichiometry, thermochemistry, etc. We will break at various times to discuss issues of interest you encounter that may be revealed herein.

In 7th grade **Cary Kilner** built a laboratory in his basement in which he investigated a great deal of descriptive chemistry. He graduated from Michigan State University in chemical engineering in 1969 after working five summer jobs in the chemical industry and almost completing an MBA in marketing. He then played jazz piano in Boston for ten years before following his muse into chemistry teaching. In 1980 he began that career at Exeter High School, Exeter Adult Education, Stratham Community College, Phillips Exeter Academy Summer School, and finally Somersworth High School. Cary obtained his MST in chemistry at UNH in 1995. In 2004 he took early retirement, returning to UNH as the first doctoral student in chemistry education research. His research comprises The Chem-Math Project, a recitation program that incorporates conceptual understanding with problem-solving, while addressing missing fundamental mathematics skills. Related interests include lecture-demonstration pedagogy and re-incorporating descriptive chemistry into the formal laboratory program.

**Adios Abstract DisArray: Hello Hands-on Help**

Elizabeth Stewart Miranda, Greater Lowell Technical High School

See description in previous workshop session block.

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**7/29 3:30 - 5:00 Workshop Sessions**

**Streamlining Classroom Workflows**

Kristen VanderVeen, The Bromfield School & Chris Koutros, Oliver Ames High School

An efficient classroom reduces student and teacher stress while allowing better allocation of time and energy. The presenters will share their strategies for streamlining teacher workflows, shifting common repetitive tasks to students, and making the most of the time during class and when grading and prepping outside class time. Participants will also share their favorite techniques.
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Connecting with your students
Charles McDonald, Middlesex School

Presentation description will be posted soon. Check neact.org for the latest version of this program.

Green Chemistry Design: Recycling Polylactic Acid in the High School Lab
Kate Anderson & Jane Butler, Beyond Benign

Convert a plastic cup into a household surface cleaner! This lab serves as a great introduction for students to the 12 principles of Green Chemistry. The lab enables educators to cover acids, bases and pH in addition to introductory polymer chemistry concepts. Join us as we highlight a Beyond Benign lab inspired by the work of students and professors at Simmons College that is also available in a Green Chemistry Kit from Flinn Scientific.

Kate Anderson earned her Master's in Education: Curriculum and Instruction with an emphasis in Environmental Education from Florida Atlantic University in 2006 after graduating with her B.A. degree in Political Science from the University of Massachusetts Boston. Prior to working with Beyond Benign, Kate worked in non-profit environmental education programs where she developed curriculum, taught K-5 programs, managed service-learning projects and supported professional development workshops and trainings for teachers. Since 2009 Kate has worked at Beyond Benign building green chemistry ambassador teams of exceptional teachers and college students. Kate's passion is working with students and teachers to improve education. She is dedicated to spreading the word that green chemistry offers solutions to the environmental challenges of today and tomorrow.

Janie Butler graduated with a Bachelor’s of Science in biochemistry from Loyola University of Maryland, specializing in environmental and sustainability studies. She became involved with green chemistry through various research projects focusing on phytoremediation and benthos cycling at Loyola University, University of Auckland, and the Leibniz-Institute of Berlin. These research projects sparked Janie’s passion to study sustainability in chemistry, as well as public education. Her enthusiasm for Green Chemistry education grew while she served as a teaching assistant in the undergraduate chemistry curriculum in both lecture and lab settings. Her exposure to education was enhanced through becoming a Supplemental Instruction (SI) Leader in chemistry education.

Tuesday Sessions

7/30 8:15 - 11:30 Optional Field Trip

Cabot Corporation Field Trip

Cabot Corp (Business and Technology Center located 157 Concord Rd Billerica) is a global specialty and performance materials company serving key industries such as transportation, infrastructure, environment and consumer. One of several Cabot products that has many applications is carbon black. Carbon black is made from petroleum based feedstock. It is graphite like and has a shape similar to grapelike clusters. There are numerous grades that are based on the size and shape of the carbon black particles. During the visit you will learn at a high level how various materials are made and used in a variety of applications. We will provide insight as to what chemists and chemical engineers do at Cabot.
Water Testing Workshop
Arjun Bir, Oasis Water Technologies

This is a hands-on follow-up to the plenary lecture. Mr. Bir will answer questions and lead attendees through using kits to test water samples.

Arjun Bir graduated from Georgia Tech in the Spring of 2018 with a Bachelor's Degree in Civil Engineering. He is originally from Bangalore, India, where he founded the country's first student-run non-profit at the age of 16. Named "India Forward", the organization is dedicated to making quality education accessible to those that cannot afford it, and over the last 6 years it has renovated government-run schools, raised over $50,000 in school and college scholarships, and has been actively involved in mentorship and after-school programs in Bangalore's orphanages and slums. Arjun was awarded the Rotary Youth Icon Award for his work with India Forward.

Arjun joined Georgia Tech in 2014 as an undergraduate civil engineering student, and began working with Dr. Joe Brown to broaden access to clean drinking water in the developing world. After two years of leading the development of low-cost water purification devices, his focus switched to accessible water testing methods. In 2016, Arjun led a capacity-building exercise focused on the use of low-cost water tests for UNICEF and the Government of Bolivia at UNICEF’s national headquarters in LaPaz. This experience inspired him to design the Oasis water test, a simple and inexpensive device that enables anyone, irrespective of age or educational qualification to test water for microbial contamination. By offering an alternative to the tedious and expensive standard method, the Oasis test enabled large scale water quality monitoring and crowd sourcing of water quality data for the first time. Field trials conducted in partnership with UNICEF and universities across the world, including Georgia Tech, established the test as a powerful and accurate device. Arjun founded a company headquartered in Bangalore, India to take these tests to the market, and was awarded the 2018 MIT Water Innovation Prize for his work.

Enhancing Student Inquiry in the Chemistry Classroom
Dan Damelin & Tom Farmer, Concord Consortium

Having students learn science by doing science encourages student agency and engagement, and builds greater understanding of the phenomena being explored. However, engaging in inquiry in the classroom can be difficult because of time, tool, and resource constraints. In this session participants will learn engage with free software, curricula, and pedagogical strategies to overcome these constraints, making student-centered inquiry and experimentation more possible. Participants will learn to use a unique, free tool called CODAP, which provides a central place for gathering data from multiple sources such as hands-on experiments, simulations of phenomena, and public data sets. CODAP has been designed from the ground up for students to explore and learn from data. By having one application for doing data collection and analysis with supporting student and teacher materials, the constraints of time, tools, and resources can be minimized allowing students to engage in sense-making through student centered experiments and analysis.

Participants should bring their own laptop or chromebook.
Daniel Damelin has worked in the field of education for 25 years, as a teacher, curriculum and technology developer, professional development leader, and educational researcher. A long standing NEACT member, he is currently an employee of the non-profit Concord Consortium, where he has worked on numerous NSF and foundation funded projects that resulted in open educational resources to support the learning of science through simulation, interactive curriculum and pedagogy, data analysis, and formative assessment.

Tom Farmer is currently working as a curriculum designer and developer at the Concord Consortium. Tom started his career as a field biologist, studying prairie dogs in Colorado and forests in Washington state before moving into formal education, teaching at the middle and high school levels. Before coming to the Concord Consortium, Tom spent more than a decade at the Gulf of Maine Research Institute translating marine science into physical and virtual platforms for middle school learners, part of his ongoing quest to use technology to help students uncover the true nature of science.

How do you know what your students understand about chemical ideas?
Marianne Dunne, Chandler Smoak, and Michael Clinchot, Boston Public Schools

In this interactive workshop you will engage with a collaborative team of Boston Public School science teachers, chemists and education researchers from UMass Boston to review how student formative assessments of chemical ideas has informed our classroom practice. Formative assessment is a powerful tool for learning ways our students think and solve problems using science. It involves four main practices of teachers: eliciting students’ ideas, noticing the substance of student thinking, interpreting to make sense of this, and acting on what is learned to further support student learning. Recognizing that NGSS requires students use of the practices, core ideas, and cross-cutting concepts to develop critical thinking skills and conceptual understanding, the project is transforming teaching and learning in BPS. We will share the development of formative assessments that are accessible and elicit student ideas, and how to examine and notice the substance of student’s chemical thinking.

Michael Clinchot is an eighth grade science teacher in the Boston Public Schools district, where he has been teaching since 2013. Prior to Boston, he taught for 15 years in New York City at the middle school level teaching science and social studies. Michael also works with a group of Boston Public Schools teachers looking at how to best help students learn science. The group has attended and presented at National Science Teaching Association, American Educational Research Association, and the National Association for Research in Science Teaching. Michael has presented multiple times at the National Science Teaching Association about the ACCT project as well.

Marianne Dunne is the ACCT Project coordinator and BPS Science Department Professional development specialist and has been working in BPS for just over a year. Prior to joining the ACCT project team, she was a K-8 Science Instructional coach and 7th grade science teacher for 13 years with Cambridge Public Schools. In addition, she worked as a science educator and manager of student and teacher programs at the Museum of Science in Boston for many years. Marianne is passionate about science education and supporting science instruction in both formal and informal settings. Marianne has presented at the National Science Teaching Association about the ACCT project as well.

Chandler Smoak has been teaching chemistry to 11th and 12th grade students in the Boston Public School system for the past 3 years. Prior to that, she completed her master’s program through the Boston Teacher Residency at the University of Massachusetts Boston with a focus on secondary science education. In her classroom, she is dedicated to creating an inclusive environment that fosters creative
chemical thinking with a focus on real world applications while maintaining rigorous and effective practices for lifelong scientific curiosity.

__7/30 12:30 - 2:00 Workshop Sessions__

**Lessons Learned from the 100th Anniversary of the Periodic Table**
Karen Byrne, Natick High School, ret.

This year (2019) we are celebrating the 150th Anniversary of the Periodic Table, which was formulated in 1869 by Dmitri Mendeleev. Fifty years ago (1969) the celebration of the 100th anniversary coincided with my first year as a chemistry teacher at Natick High in Natick, MA. At that time I was trying to establish my teaching style and I subscribed to Chemistry magazine published by the American Chemical Society. One of the 1969 issues of the magazine devoted itself to the celebration of the 100th anniversary and there were many articles related to the Periodic Table. Two of those articles greatly influenced my approach to teaching my students about the Periodic Table for my entire teaching career. During this workshop, I will share the activities and insights from my experience.


**Enhancing Student Inquiry in the Chemistry Classroom**
Dan Damelin & Tom Farmer, Concord Consortium

See description in previous workshop session block.

**How do you know what your students understand about chemical ideas?**
Marianne Dunne, Chandler Smoak, and Michael Clinchot, Boston Public Schools

See description in previous workshop session block.
Wednesday Sessions

7/31 9:15 - 10:45 Workshop Sessions

A High School Organic Chemistry Course
Koby Osei-Mensah, Loomis Chaffee School

In my presentation, I will review how I designed my organic chemistry course: topics covered, types of students who take the class, the format of a typical class, labs conducted, how “Chem Draw” software is used, tests given, the format of lab reports, waste disposal, the final project for the class. I will also show samples of student work.

Koby Osei-Mensah has been teaching Advanced Chemistry and College Level (CL) Chemistry at Loomis Chaffee since 2011. He also coaches girls 3rds soccer in the fall and the science bowl team in the winter. He serves as the Chemical Hygiene Officer in the science department. In 2015 he served as the faculty coach for the school’s space team that designed an experiment that was carried out on the ISS. Koby has a bachelor's degree in chemistry from Middlebury College and a masters in chemistry from the University of St. Joseph in West Hartford, CT. He developed the organic chemistry course at Loomis and has taught it since 2014.

Periodic Table Puzzlers
Mystery Chemist TBA

After the previous lecture, join us to solve a variety of periodic-table puzzles appropriate for use in the classroom.

Redefining the "Front of the Room"
Charles McDonald, Middlesex School

Lab classrooms and flipped classrooms dare us to innovate our classroom spaces. Thanks to technology, the traditional idea of a “Teaching Wall” can now be mobile or online or at any student's station begging the question “Where is the _front_ of the room?” In the workshop, we will explore how Screen Mirroring and Mobile Devices allow any student to be front and center no matter where or when they choose to engage in class.

Trading Tips on Element Labs
Susan Klemmer, Camden Hills Regional High School

We all do some activities or labs related to the properties of elements: testing to see if elements are metals, nonmetals or metalloids, identifying a metallic element through its specific heat or its density. This presentation is an opportunity to share tips and questions on how to make these classic investigations better. Have or need a way of getting more accurate experimental values? How about making the activity more relevant, or more closely linked to NGSS practices and core concepts? I'll facilitate the discussion and get the ball rolling with a couple of ideas and a question of my own, but this session will depend on participants to share their knowledge and their questions, their experiences and their concerns.

Sue’s bio is available under her workshop in the Monday 7/29 1:45 session block.
7/31 11:00 - 12:30 Workshop Sessions

Supporting Abstract Learning with Simulations
Emily Allen, Governor's Academy

One of the most beneficial uses of computer simulations is the availability of educational resources for all. Simulations provide a dynamic and self-paced platform for students to model abstract concepts, and can be used to supplement or even replace expensive hands-on lab equipment. Our research in science education at Governor's Academy focuses on the design, development, and implementation of desktop- and mobile-ready HTML5 simulations and accompanying teaching materials. In the session, participants will have the opportunity to explore the functions and benefits of our growing catalogue of more than 200 science simulations. The findings of our current research in physics will also be discussed as a means of identifying possible implementation and future research using chemistry simulations focused on such concepts as heat, thermodynamics, ideal gas laws, electric forces, and nuclear reactions. Three specific goals for discussion will be how the simulations and accompanying teaching materials can be utilized to (1) support student learning differences, (2) encourage collaborative learning, and (3) provide easy access to learning materials for our participants and their students.

Dr. Emily Allen is an education researcher and science teacher with more than ten years experience. After teaching high school chemistry and physics, Emily earned her doctoral degree from Boston University where she studied student misconceptions of atomic and molecular structure. After several years of teaching, research, and curriculum development at Boston University, Emily has recently returned to the high school classroom at The Governor's Academy. Her favorite element is, and always will be, carbon – for all of its beautiful and enduring forms.

Elements, compounds, and a vocabulary card sort
Ariel Serkin, Norfolk County Agricultural High School

How many of you could recite, word for word, a definition you learned in school but, you struggled to apply it to a new situation and maybe you were unsure of how to construct a model of what it meant? Using a vocabulary card sort participants will help learn how to help students develop their own definitions for terms such as elements and compounds using particle diagrams.

Ariel Serkin is excited to be finishing up her chemcation2019 at NEACT. You can find her talking about chemistry education or nerdy t shirts pretty much anytime you run into her whether in person or on social media.

Customizing Your Periodic Table
Chris Koutros, Oliver Ames High School

This workshop will review multiple interactive and printable periodic table resources and how teachers can use them in their classes. Participants who bring a device will also be able to customize a periodic table with their favorite data and leave the conference with a periodic table appropriate for photocopying or hanging on their classroom wall.
**Chris Koutros** has taught Chemistry for 15 years and is the NEACT Southern Division Chair. He earned his Bachelor’s degree from the College of the Holy Cross, an M.S. in Chemistry from UMass Boston, and an M.Ed. in Instructional Technology from Bridgewater State University. He has extensive experience with POGIL, integrating technology in a BYOD environment, and giving students strong lab experiences. Chris is usually in his element: his wedding ring is tungsten, he enjoys skiing on carbon-titanium skis, sailing with a carbon fiber mast, and taking walks with his black lab, Beaker.

**Periodic Table games. Applying NGSS crosscutting Concepts of Patterns**
Jerusha Vogel, Greenwich High School

Presentation description will be posted soon. Check neact.org for the latest version of this program.

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**7/31 1:30 - 3:30 Optional Field Trip**

**True West Brewery Field Trip**

True West Brewery is a family-owned village-supported farm-to-table restaurant and craft brewery in Acton, Massachusetts. In this field trip, you will view the brewing apparatus and learn about the mashing process of malted cereals, the organic chemistry going on in this step, and the functions of yeast in aerobic and anaerobic phase fermentation. After the tour, stay a while and sample the delicious food and beer.

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