

198th 2YC₃ Conference (Midwestern)

“Inspiring the Next Generation”

Harper College
1200 West Algonquin Road
Palatine, IL
September 21-22, 2012

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Friday, September 21

- 8:00 – 5:00 **Exhibits (Avanté Concourse)**
- 8:00 – 1:00 **Registration, Refreshments, and Exhibits (Avanté Concourse)**
- 9:00 – 9:15 **College President’s Welcome and Opening Remarks (Z102)**
Dr. Kenneth Ender, President, Harper College
- 9:15 – 10:15 **Keynote Address (Z102)**
Dr. Moses Lee, Dean of Natural and Applied Sciences, Hope College, Holland, MI
- 10:15 – 10:45 **Refreshment Break and Exhibits (Avanté Concourse)**
- 10:45 – 11:25 **2YC₃ General Membership Meeting (Z102)**
- 11:30 – 12:15 **Parallel Presentation Session 1**
- A. High Altitude Research Platform with real-time sensors for engaging undergraduates in STEM (Z102)
Don Takehara, Taylor University, Upland, IN
- B. The Role of a Lab Director in Today’s Community Colleges (Z119)
Matthew Sweis, Lab Director, Moraine Valley Community College, Palos Hills
- 12:15 – 1:00 **Lunch Break and Exhibits (Avanté Concourse)**
- 1:00 – 3:00 **Workshop 1 (Z129)**
Resources for Excellence: A Collaborative Project of the 2YC₃ and the ACS
Dolores Aquino, San Jacinto College, TX
Amy Jo Sanders, Stark State College, Canton, OH
- 1:00 – 1:45 **Parallel Presentation Session 2**
- A. Introducing Multiculturalism Into the Chemistry Lab via an Investigation of Rubber (Z117)
Joe Wachter, Harper College, Palatine, IL
- B. Inspiring the Next Generation by Infusing Concepts of Forensic Chemistry into the Curriculum (Z119)
Bal Barot, Lake Michigan College, Benton Harbor, MI
- 1:50 – 2:35 **Parallel Presentation Session 3**
- A. Inspiring Enthusiasm via Authentic Research Projects in Organic Courses (Z117)
Daniel Stanford, Harper College, Palatine, IL
- B. Development of a Food Chemistry Course (Z119)
Gunay Ozkan, College of Southern Nevada, Las Vegas, NV
- 2:35 – 3:00 **Refreshment Break and Exhibits (Avanté Concourse)**

- 3:00 – 3:45 **Parallel Presentation Session 4**
- A. Assessing Student Learning From Research in the Organic Laboratory (Z102)
Roger House, Harper College, Palatine , IL
- B. Designing and Teaching a Blended Science Course (Z119)
Deepa Godambe, Harper College, Palatine , IL
- 3:00 – 3:45 **Tour of Harper Chemistry Department Facilities with Emphasis on Safety Features (Tour begins at Z308)**
Kelly Jones, Coordinator of Chemical Technologies & Chemical Hygiene Officer
- 3:50 – 4:35 **Parallel Presentation Session 5**
- A. Online Tools for the In-person Lab: Instructional Videos and Quizzing to Prepare and Assess Students in the Introductory Chemistry Lab Course (Z102)
Andrew Aspaas, Anoka-Ramsey Community College, Cambridge, MN
- B. Spectroscopy can be Visual, Hands-on, and Quantitative (Z119)
Michael Collins, Viterbo University Emeritus
John Amend, Montana State University Emeritus
- 4:35 – 5:00 **Refreshment Break and Exhibits (Avanté Concourse)**
- 5:00 – 6:00 **Reception (Wojcik Conference Center)**
- 6:00 – 8:30 **Dinner Banquet and Address (Wojcik Conference Center)**
Dr. James Salvador, Senior Researcher,
Chemical Sciences and Materials Systems Lab, General Motors

Saturday, September 22

- 8:30 – 4:00 **Exhibits (Avanté Concourse)**
- 8:30 – 9:00 **Registration, Refreshments, and Exhibits (Avanté Concourse)**
- 9:00 – 9:15 **Opening Remarks (Z102)**
- 9:15 – 10:00 **Parallel Presentation Session 6**
- A. The Skyway Collegiate Conference STEM Poster Contest (Z102)
Steve Socol, McHenry County College, Crystal Lake, IL
Alejandra Hernandez, and Grant Thompson, Students McHenry County College, Crystal Lake, IL
- B. Inspiring and Mentoring After the Fact...Students' Perspectives (Z119)
Amy Joy Richter, Abbott Laboratories
Anna Angiuli Weiss, Loyola University Chicago
C. Jayne Wilcox, Harper College, Palatine , IL
- 9:30 – 12:05 **Workshop 2 (Registration Required; Z351)**
Instrumentation: Sodium NMR of Foods and GC Analysis of Nail Polish Remover
Daniel Stanford
- 10:00 – 10:30 **Refreshment Break and Exhibits (Avanté Concourse)**

- 10:30 – 11:15 **Parallel Presentation Session 7**
- A. Incorporating STEM Research in a First Semester Science Course (Z102)
Pamela Goodman, Moraine Valley Community College, Palos Hills, IL
Dana Hamed, Tiwana Morrison, and Robert Simon, Students, Moraine Valley Community College, Palos Hills, IL
- B. Thematic Classroom and Laboratory Activities for General Chemistry, Part 1 (Z119)
Heather Mernitz, Alverno College, Milwaukee, WI
- 11:20 – 12:05 **Parallel Presentation Session 8**
- A. What's the difference between Teaching and Education? (Z102)
Kelly Befus, Anoka-Ramsey Community College, Coon Rapids, MN
- B. Thematic Classroom and Laboratory Activities for General Chemistry, Part 2 (Z119)
Heather Mernitz, Alverno College, Milwaukee, WI
- 12:05 – 1:00 **Lunch Break and Exhibits (Avanté Concourse)**
- 1:00 – 3:00 **Student Poster Session (Avanté Concourse)**
- 1:00 – 1:45 **Parallel Presentation Session 9**
- A. How To Teach Safety to the Next Generation When Your College is Stuck in the Last Century (Z102)
Kelly Jones, Coordinator of Chemical Technologies & Chemical Hygiene Officer, Harper College, Palatine, IL
- B. Molecular Origami for Biochemistry: Your students can build accurate models of proteins, carbohydrates, lipids, and DNA! (Z119)
Charles Abrams, Truman College, Chicago, IL
- 1:50 – 2:35 **Parallel Presentation Session 10**
- A. Choice Scholars: A Summer Bridge Program (Z102)
Julie Ellefson, Harper College, Palatine, IL
- B. Developmental Chemistry Course to Ensure Success in Non Traditional Students (Z119)
Li Li Zyzak, Harper College, Palatine, IL
- 2:35 – 3:00 **Refreshment Break and Exhibits/Closing Session (Avanté Concourse)**

Registration

Registration can be completed at the 2YC3 website: www.2yc3.org, click on Meetings tab.

Lodging and Directions

These hotels are approximately two miles south of the Harper campus and will have shuttle service available to the campus.

Holiday Inn Express Chicago-Schaumburg
1550 North Roselle Road
Schaumburg, IL 60195
(847) 310-0500
\$76/night; mention 2YC3 conference group
Deadline to book is August 23rd.

Wingate by Wyndham Schaumburg
50 Remington Road
Schaumburg, IL 60173
(847) 882-5000
\$85/night; must call hotel directly and mention 2YC3 conference
Rate is good as long as rooms are available.

Directions to Harper College

From the north: Take Highway 53 south to Algonquin Road exit. Go west on Algonquin Road to Harper College. The entrance to the College is on the north about one block east of Roselle Road.

From the south: Take Highway 53 north to Algonquin Road exit. Go west on Algonquin Road to Harper College. The entrance to the College is on the north about one block east of Roselle Road.

From the east: Go west on the Northwest Tollway (I-90) to the Roselle Road exit. Go north on Roselle Road to Harper College. Go east on Algonquin about one block and then turn left onto the campus.

From the west: Go east on the Northwest Tollway (I-90) to Highway 53. Go north on Highway 53 to the Algonquin Road exit. Go west on Algonquin Road to Harper College. The entrance to the College is on the north about one block east of Roselle Road.

From O'Hare International Airport: Go west on the Northwest Tollway (I-90) to the Roselle Road exit. Go north on Roselle Road to Algonquin Road. Go east on Algonquin about one block and then turn left onto the campus.

The Avante Center is the large building with the glass concourse facing Algonquin Road. The registration table will be near the main entrance and exhibits will be located in the concourse.

Abstracts

FRIDAY

Keynote Address

Why Students Should Do Undergraduate Research, and Why Institutions and Foundations Should Support It?

Moses Lee, Dean for Natural and Applied Sciences & Professor of Chemistry, Hope College, Holland MI

The future of the USA as the world leader in scientific innovation is under serious threat, if immediate measures are not taken to reverse or stem the tide. The two main factors that contribute to this threat are: lack of interest among young American students to pursue careers in science, technology, engineering and mathematics (STEM) fields, and the impact of globalization in the 21st century. My presentation will focus on addressing the former factor, and devising a way to engage students that raises their interest in STEM fields. Even though this factor is complex, and several best practices have been identified that enhance students' interest in learning and pursuing STEM career, I am convinced that undergraduate research is possibly the most important, albeit a time and resource demanding, practice for chemistry and other STEM fields. This is paramount at predominantly undergraduate institutions (PUIs), particularly at two-year colleges where enrollment has seen a significant growth in recent years. PUIs have traditionally produced more students on a per capita basis who go on to obtain PhD degrees. There is now strong evidence to support that undergraduate research enables student learning; student recruiting; STEM (chemistry) retention, including minority students; student motivation to pursue PhDs and work in chemistry or chemistry-related fields; and it keeps faculty vibrant and engaged in their respective field. Accordingly, for the U.S.A. to remain creative and globally competitive in terms of STEM innovation, which ultimately will lead to economic prosperity and maintaining our strong standard of living, schools and funding agencies must support undergraduate research at all levels.

Dr. Lee's Biographical Sketch

Moses Lee received his B.S. and Ph.D. degrees from University of Guelph, Canada, in 1983 and 1986, respectively. After a year of postdoctoral studies at the University of Alberta, he joined Synphar Laboratories, Inc., a subsidiary of Taiho Pharmaceutical Company of Japan as a research scientist. In 1989, he joined the chemistry faculty at Furman University in South Carolina, USA, and was appointed to the Rose J. Forgione Chair and promoted to full professor in 1998. In 2005, he moved to Hope College to serve as Dean for the Natural and Applied Sciences Division and Professor of Chemistry.

Dr. Lee is a staunch proponent of STEM (science, technology, engineering, mathematics) education, and he is a national leader in promoting the best practice of "learning science is best done through the pursuit of original research." This is a mark of distinction for Hope College. Together with the faculty, the Natural and Applied Sciences Division actively pursues two visionary goals: raising the academic excellence to a higher and uncharted level, and to become more inclusive by broadening the participation of students traditionally underrepresented in STEM field in Hope's research and academic programs. In spring 2011, as part of the national celebration of undergraduate research week declared by the US House of Representative, and sponsored by the Council on Undergraduate Research (CUR), Dr. Lee hosted a national webinar entitled, "*Transformational Learning Through Undergraduate Research and Creative Performance.*"

Dr. Lee actively pursues research involving undergraduate and high school student coworkers, and to date he has mentored close to 300 undergraduate students, 13 post-docs, 5 PhD students, and 32 MS students in his laboratories. Together, they have published more than 170 peer-reviewed research publications in various fields including anticancer drug design, biochemistry, molecular pharmacology of anticancer and anti-infective drugs,

as well as chemical education. His research program has received continuous unsolicited funding from federal agencies (such as NSF and NIH), private foundations, and business corporations. He has served on the boards of Research Corporation, ACS-Petroleum Research Fund, West Michigan Science Technology Initiative, and The Murdock Trust, and he also served one year as an expert consultant at the NSF, where he spearheaded the Undergraduate Research Collaborative (URC) program. Dr. Lee was the recipient of the *Henry Dreyfus Teacher-Scholar Award* (1994-1999), the *Camille and Henry Dreyfus Scholar-Fellow Award* (2002-2005), and the *ACS Award for research at an undergraduate institution* (2009).

Presentation 1A

High Altitude Research Platform with real-time sensors for engaging undergraduates in STEM

Don Takehara, Taylor University, Upland, IN

Taylor University's High Altitude Research Platform (HARP), with sensors that stream data to earth, uses a high altitude balloon to send student experiments 20 miles into the stratosphere. At this altitude, the blackness of space is visible along with the earth's curvature, thin layer of atmosphere, and features below. Temperatures to -60C, and pressures to 0.01 atm are obtained along with high UV, radiation, and widely varying humidity. Sensors capturing data every second include temperature, pressure, altitude, humidity, UV, IR, CO₂, visible light, Geiger counter, and video cameras. 50+ universities were trained to implement HARP into undergraduate STEM courses. Assessment of student learning shows statistically significant improvements in intrinsic motivation, valuing science, application knowledge, metacognition, cognition, and content knowledge. Current efforts are focused on best practices for broad dissemination to universities, implementation into education curriculum, building a network of collaborating universities, and developing a spectrometer for analyzing chemical species.

Presentation 1B

The Role of a Lab Director in Today's Community Colleges

Matthew Sweis, Lab Director, Moraine Valley Community College, Palos Hills

Today the responsibilities of the lab director at Moraine Valley Community College are changing to better meet the dynamic needs of our community, the college and our students. This "behind the scenes" position is becoming more visible and more critical in responding to our dynamic chemistry department. Today there is a much more direct interaction with students. The lab director has a stronger voice in laboratory curriculum, serves as an alternate contact for the department chair for adjunct faculty lab orientation and assists adjunct faculty in lab demonstrations, works closely with the STEM Coordinator (Pam Goodman), and our outreach projects such as Chemistry Connections. Chemistry Connections is a program that promotes science education in elementary schools. Chemistry Connections demonstrates the countless ways chemistry touches our lives and is geared toward third, fourth, fifth and sixth graders. This international program teaches students about science through hands-on experimentation.

Workshop 1

Resources for Excellence: A Collaborative Project of the 2YC3 and the ACS

Dolores Aquino, San Jacinto College, Pasadena, TX

Amy Jo Sanders, Stark State College, Canton, OH

Feeling overwhelmed by the constant economic, educational, and political factors that continuously reshape the two-year college environment? Workshop participants will consider their goals, share ideas, resources and connections, and develop strategies for engaging colleagues and inspiring the next generation.

Presentation 2A

Introducing Multiculturalism Into the Chemistry Lab via an Investigation of Rubber

Joe Wachter, Harper College, Palatine, IL

Multicultural education, commonly addressed in many academic fields, is rarely emphasized in the sciences, particularly in chemistry. One way multicultural education is important to the sciences is to debunk the misconception of the inherent intellectual superiority of the Western world, whose work in science we study almost exclusively (*Science Ed.* **2001**, 85, 6-34). To this end, a laboratory exercise was developed for a non-majors chemistry course comparing Charles Goodyear's rubber vulcanization process to the traditional process of ancient Mesoamericans thousands of years earlier, which has been recently shown to produce a nearly identical product (*Science* **1999**, 284, 1988-1991). Students participated in an inquiry-based activity to vulcanize rubber using both methods, characterize them, and discuss the implications for the historical narrative of science and intellectual property.

Presentation 2B

Inspiring the Next Generation by Infusing Concepts of Forensic Chemistry into the Curriculum

Bal Barot, Lake Michigan College, Benton Harbor, MI

Starting from scientific method in introductory chemistry to mass spectrum analysis in organic chemistry, class is taught by infusing chemical principles and concepts of Forensic Chemistry, whenever appropriate. We have introduced few presentations, experiments and assignments in both these classes from Forensic curriculum perspective and found students receptive. Chemical examples showing critical thinking involved in the scientific methodology starting from identifying the problem leading to final solution with accurate data collection, logical analysis, and common sense interpretation will be presented. Role of graded assignment as well as field trips in mastering chemistry concepts will be presented.

Presentation 3A

Inspiring Enthusiasm via Authentic Research Projects in Organic Courses

Daniel Stanford, Harper College, Palatine, IL

It has been my observation through mentoring undergraduate researchers that the experience motivates them to be better students. So much so it is an experience I would like all of our chemistry students to have. However, that is not logistically possible through a traditional research experience. So I have brought research experiences into my regular sophomore organic course in both first and second semester. My presentation will describe the projects we have attempted.

Presentation 3B

Development of a Food Chemistry Course

Gunay Ozkan, College of Southern Nevada, Las Vegas, NV

This new course (Food Chemistry-4 credits) is designed for students with a minimal background in science or math and that have never taken a chemistry course before. The course starts with basic knowledge of chemistry such as dimensional analysis, measurements, matter, atoms, periodic table, molecules, compounds, and continues with basic information on organic compounds. Then students are introduced to function of water and other nutrients in human body such as proteins, fats, and carbohydrates. Also, they will be exposed to flavoring, food coloring and additives and, their use and misuse. There are 11 experiments using household items, designed in a way that students will be able to complete these experiments in their own kitchen using their own tools and some materials provided as a lab kit. Students will explore those concepts through power point lectures and through research. My hope is after taking this course students will be informed and knowledgeable consumers without the fear of science and math.

Presentation 4A

Assessing Student Learning From Research in the Organic Laboratory

Roger House, Harper College, Palatine, IL

Recently the organic chemistry laboratory at Harper College has begun to integrate multi-week authentic research experiences for the students. This presentation will share the results of ongoing assessment of this curricular reform. The assessment has focused on investigating the content learning that takes place in the laboratory, the laboratory manipulation skills of the students, and also affective changes that take place during the project.

Presentation 4B

Designing and Teaching a Blended Science Course

Deepa Godambe, Harper College, Palatine, IL

Teaching and learning in the Blended format affords unique opportunities for the learner and instructor. This session explores how the blend may be designed, the use of scaffolds to keep students engaged, and the use of a variety of assessment techniques. Each participant will produce at least one 'game' at the end of the session that will facilitate student learning.

Tour of Harper Chemistry Department Facilities with Emphasis on Safety Features (begins at Z308)

Kelly Jones, Coordinator of Chemical Technologies & Chemical Hygiene Officer

Tour the Harper Chemistry Department and see a well- designed, functional prep room, a chemical storage room full of safety features, discussion rooms and laboratories where students and faculty have plenty of space to work safely, a research laboratory where students are able to work closely with a faculty advisor, a well- designed organic chemistry laboratory where all students perform their work inside fume hoods, and an instrument room with more than \$700k of impressive instrumentation. Test face wash stations and safety showers, see well-stocked safety stations and learn what supplies you need to prepare safe laboratories. If you are in the process of redesigning your laboratories, building a new science facility, or just want to improve the safety of your department, tour the Harper Chemistry Department for inspiration.

Presentation 5A

Online Tools for the In-person Lab: Instructional Videos and Quizzing to Prepare and Assess Students in the Introductory Chemistry Lab Course

Andrew Aspaas, Anoka-Ramsey Community College, Cambridge, MN

In an effort to better prepare students for each lab experiment in our introductory chemistry course, students at Anoka-Ramsey Community College watch an instructional video and take a brief online quiz on their own before they perform an experiment. After each lab, students take an additional online quiz to efficiently assess the knowledge they learn in lab. Students have responded favorably to these activities, and are better prepared in the techniques and concepts required for lab. It has cut down on the time required for prelab lectures, and reduced accidents. We've also found that the students take more responsibility for their own learning in lab, knowing they will have to take an online quiz individually afterwards.

Presentation 5B

Spectroscopy can be Visual, Hands-on, and Quantitative

Michael Collins, Viterbo University Emeritus

John Amend, Montana State University Emeritus

Light is the language of atoms. Listen carefully, and they will tell you who they are, how many of them are present, and if they are paired up with other atoms to make molecules. Atomic emission spectrophotometry has given us much of our understanding of the behavior of electrons in atoms. Molecular absorption

spectrophotometry is the most-used analytical tool for medical and environmental chemistry. But our students encounter this colorful, useful, and visually striking information as black-and-white numbers and graphs coming out of a black box. This talk will introduce some new, inexpensive hardware and software tools that bridge the gap between visual, conceptual, and quantitative information. Each student can have a low-cost 1000 channel diode array spectrophotometer at their lab station. Students can view colored emission lines, measure their wavelength with an accuracy of about 1 nm, and use this information to test atomic models. An inexpensive scanning spectrophotometer shows simultaneous visual absorption spectra and graphical and quantitative Beer's Law data, and correlates molar absorptivity constant with Beer's Law sensitivity. Powerful, easy-to-use image analysis software developed by NIH for medical imaging transparently translates colored visual spectra into graphs and calibration equations. Students move transparently from observation of a colored visual spectra to a graphical image, then to a mathematical model, and then use this model to predict another property of the system.

Banquet Presentation

Challenges and Opportunities in Meeting 2020 CAFE Standards: The Chemist's Role in Sustainable Mobility.

James R. Salvador, Chemical and Materials Systems Laboratory, General Motors Global Research and Development Center, Warren, MI

Corporate Average Fuel Economy (CAFE) standards came into existence in 1975 as a response to the 1973 oil embargo. This regulation set out to double the fuel economy of the US automotive fleet by the year 1985, but persistently low fuel costs throughout the 80s and the 90s led to the virtual abandonment of these goals and the pervasion of new vehicles like SUVs largely reversed the direction of fuel economy improvement progress. Today, however, the situation appears to be fundamentally different and new CAFE standards introduced in 2011 have similarly aggressive goals to past regulatory efforts. The difference today is that the rapid development of new economies like those in Asia comes with the demand for personal mobility; we see this reflected in the fact that China is now one of the largest car markets in the world with millions of new cars added to the roads annually. The ever increasing demand for petroleum to power these new vehicles has led, and will likely continue to lead, to high oil prices. This coupled with the emerging problems associated with global climate change makes it imperative that we as an industry and a nation face the challenge of reducing our fossil fuel usage head-on. Meeting these challenges will fall to the generation we are currently educating and so the need to attract and retain students in the STEM areas is as crucial as ever.

In this talk I will highlight some of the research activities at General Motors Global Research and Development and its corporate and university partners aimed at addressing the challenges of reducing fuel consumption without impacting utility, safety or the driving experience for the customer. The focus will be on research activities most closely tied to chemistry and work done by many of our very talented college interns including: vehicle light-weighting; battery technology development; permanent magnet and thermoelectric materials; and alternative powertrain development work. There are many technical and economic challenges in trying to introduce new technology into the automotive industry and some these will be highlighted during the course of the research presentation.

SATURDAY

Workshop 2

Instrumentation: Sodium NMR of Foods and GC Analysis of Nail Polish Remover (Z351)

Daniel Stanford

First, participants will learn how to transfer viscous food samples in and out of a 5 mm NMR tube and acquire ^{23}Na spectra. They will then determine the sodium concentration in their food samples using the peak integrals from the spectra of foods and a calibration curve generated from spectra of sodium standards. This experiment is quick, straightforward, and has been used in intro non-majors courses. Participants will also get an opportunity

to prep and run gas chromatography/mass spectrometry (GC/MS) on nail polish removers to qualitatively identify the active ingredient. The activities will run simultaneously; attendees can choose to participate in either or both activities.

Presentation 6A

The Skyway Collegiate Conference STEM Poster Contest

Steve Socol, McHenry County College, Crystal Lake, IL

Alejandra Hernandez, and Grant Thompson, Students McHenry County College, Crystal Lake, IL

In order to encourage research at two-year colleges, the Skyway Collegiate Conference, which consists of eight two-year colleges west of Chicago, has been supporting an annual STEM poster contest. Students complete a research project under the direction of a faculty advisor, and present a poster at the conference. The posters are judged by a group of outside experts on the basis of experimental design, the general appearance of the poster, and students' answers to questions about their research. An overview of the contest will be presented along with examples of student projects. A student project which involves kinetic studies of the hydrolysis of carbohydrates will be presented.

Presentation 6B

Inspiring and Mentoring After the Fact...Students' Perspectives

Amy Joy Richter, Abbott Laboratories

Anna Angiuli Weiss, Loyola University Chicago

C. Jayne Wilcox, Harper College, Palatine, IL

Two students who have chosen chemistry as their career choice will share their thoughts about what motivated and inspired them when they were in school. They will provide their perspective on what we, as mentors and educators, can do to improve both our students' experience in the undergraduate classroom and also their preparation for what to expect when they "move on".

Presentation 7A

Incorporating STEM Research in a First Semester Science Course

Pamela Goodman, Moraine Valley Community College, Palos Hills, IL

Dana Hamed, Tiwana Morrison, and Robert Simon, Students, Moraine Valley Community College, Palos Hills, IL

At Moraine Valley Community College, the majority of our submissions to the Skyway STEM competition come through our first semester science courses. Nonetheless, we have found these classes to be most open to the mission of the STEM philosophy. The one theme which is critical to understanding science is the scientific method and this is best taught through personal experience. This theme becomes the keystone to the course itself and the glue that holds together the many concepts throughout the semester. Although all lecture material and most laboratory experiments are retained, focus is always kept on the scientific method so that students are enabled to use that knowledge to complete their own research projects to present at the annual Skyway STEM competition. The STEM Co-Coordinator and several student STEM Research participants will share their "best practices" from the MVCC program.

Presentation 7B

Thematic Classroom and Laboratory Activities for General Chemistry, Part 1

Heather Mernitz, Alverno College, Milwaukee, WI

What is the difference between a trans-fat and an omega-3 fatty acid? How is acid rain formed? How much energy is in my food? This session will introduce activities from the ChemConnections Activity Workbook that includes 59 classroom tested activities written in the context of societal and environmental issues. These activities will help students learn general chemistry content and simultaneously understand how chemistry relates to issues such as climate change, ozone depletion, recycling, greener fuels, and nutrition. The activities

were designed with attention to pedagogy and student learning styles and use a variety of activity styles including data analysis, laboratory, guided inquiry, and discovery. This is one of two complementary sessions. Participants can go to either or both sessions as different activities will be presented in each.

Presentation 8A

What's the difference between Teaching and Education?

Kelly Befus, Anoka-Ramsey Community College, Coon Rapids, MN

When it comes to engaging students in chemistry, especially in the introductory chemistry courses, it is a challenge. The speaker will discuss scenarios and demonstrations that she has used to make topics such as balancing equations, phase diagrams, molarity, thermochemistry, and diffusion of gasses more palatable to students.

Presentation 8B

Thematic Classroom and Laboratory Activities for General Chemistry, Part 2

Heather Mernitz, Alverno College, Milwaukee, WI

See presentation 7B.

Presentation 9A

How To Teach Safety to the Next Generation When Your College is Stuck in the Last Century

Kelly Jones, Coordinator of Chemical Technologies & Chemical Hygiene Officer, Harper College, Palatine, IL

At this talk, I'll present a timeline of safety events as mandated by the Occupational Safety & Health Administration (OSHA) and the U.S. Environmental Protection Agency (EPA) as they pertain to laboratories in academic institutions; this will allow you to evaluate in what decade your school is stuck. I'll share resources that are available to help you get your safety program on track. I'll also provide an overview of Harper's lab safety program as it pertains to administrators, faculty and staff, chemistry students and research students. Finally we'll review the new changes in Globally Harmonized System for labeling hazards, OSHA and EPA regulations that will affect laboratories in the future.

Presentation 9B

Molecular Origami for Biochemistry: Your students can build accurate models of proteins, carbohydrates, lipids, and DNA!

Charles Abrams, Truman College, Chicago, IL

Paper ribbon models of biological macromolecules are easy to construct in one laboratory period, and allow hands-on activities that are impossible with traditional model kits. The molecular structure is printed on standard weight paper, along with lines to guide folding, and pairs of numbers to align hydrogen bonds, which are secured with transparent tape. The resulting model accurately represents the backbone atomic positions of the alpha helix and beta sheet. Non-repetitive structures can also be built accurately. The resulting paper models are the physical equivalent of a cartoon representation of a protein. Tertiary interactions can be added, and a variety of super-secondary structural motifs can be created. These models are extremely inexpensive, easy to construct, and add a type of learning experience to the study of biological molecules that is not possible with computer models. An easy-to-build model of the Rossmann Fold (beta-alpha-beta) will be presented, along with student self-assessment of their learning with the activity. Interested beta testers are invited to contact the author.

Presentation 10A

Choice Scholars: A Summer Bridge Program

Julie Ellefson, Harper College, Palatine, IL

While a large percentage of students enter community colleges in need of developmental education courses, at Harper this represents 40% of our students, many of these students do not move on to college level courses or earn degrees or certificates. Strong evidence indicates the faster students successfully move through their development sequence or bypass developmental courses completely, the more likely they are to persist. Choice Scholars, a program designed to increase the percentage of students who begin in credit-bearing courses, is a four week content-based summer bridge program for students who are on the cusp of college readiness, scoring just below the cut off for college level courses in math, reading and writing. In this talk, we will provide an overview of the Choice Scholars program with an emphasis on the chemistry cohorts. While the sample size is still relatively small, the results have been quite positive in terms of student advancement, retention, persistence, and success. We will share the results and the impact of the program from both a faculty and student perspective.

Presentation 10B

Developmental Chemistry Course to Ensure Success in Non-Traditional Students

Li Li Zyzak, Harper College, Palatine, IL

Chemistry is a demanding subject that requires strengths in multiple areas such as mathematics, logical thinking, problem-solving skills, visualization, and a confidence to learn something new. These requirements present a challenge to traditional students and are almost an insurmountable barrier to non-traditional students. To that end, students, especially non-traditional students need an approach that will enable them to have the opportunity to learn and overcome their fear of Chemistry. This issue is evident in many of the chemistry classes at community colleges, where there is a larger population of non-traditional students. Unfortunately, the immersion of these non-traditional students into a full Chemistry course can lead to many dropping out of the class and most of all, losing confidence in their ability to impact their future. In order to ensure success for non-traditional students who wish to enroll in a chemistry course, there is a need for a preparatory course to strengthen their math and problem solving skills prior to enrollment. Nothing is more detrimental than destroying the confidence of a student. Conversely, nothing is more powerful than instilling confidence in these students and helping them achieve “mini-successes”. A preparatory course design to build skills in math, problem solving, logical thinking, and visionary thinking can prepare non-traditional students with the skills necessary to handle the rigors of chemistry. I believe this approach will have a win-win outcome for both the students and college. This is because the non-traditional students’ success rate will be higher and the relationship between the college and students will be enhanced as the college takes steps to ensure the success of this large and vital population.