

## Keynote Speakers

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**Friday morning: 8:45 – 9:45 a.m.**

*Innovation in museums as gateways to engaging in science for all ages*



**Jennifer Scripps**  
*Vice President of Revenue Operations*  
The Perot Museum  
Dallas, Texas

Jennifer Scripps received her Master of Business Administration from Harvard University and her Bachelor of Arts in international relations and economics from the University of Pennsylvania. She currently serves as the Vice President of Revenue Operations at the Perot Museum of Nature and Science. In this role, she works closely with all visitor and membership services to ensure optimum visitor experiences while also seeking to maximize all earned income. She is also part of the team working on the museum's large partnerships with corporations and nonprofits, namely Samsung and National Geographic. Scripps previously led the museum's efforts related to long-term business planning and managed the food service, parking, digital theater and retail businesses. She has worked at the Perot Museum since 2007 and coordinated all aspects of day-to-day planning for the \$185 million Perot Museum of Nature and Science expansion project. This involved working closely with architectural teams, three exhibition design teams and a general contractor.

**Friday evening: 7 – 8:30 p.m.**

*The chemistry enterprise: Do we have a future, or what?*



**William F. Carroll, Jr.**  
*Vice President of of Industry Issues*  
Occidental Chemical Corporation  
Dallas, Texas

Dr. William F. Carroll, Jr. holds a Doctor of Science in organic chemistry from Indiana University. He received a Master of Science degree from Tulane University in New Orleans and a Bachelor of Arts in chemistry and physics

from DePauw University in Greencastle, Ind. He is currently Vice President of Industry Issues for Occidental Chemical Corporation and also an adjunct professor of chemistry at Indiana University.

Dr. Carroll is chair of the Board of Directors for the American Chemical Society (ACS) and a former president (2005). He is a fellow of the Royal Society of Chemistry and a national associate of the National Research Council. He is also a member of the advisory board for the Tulane School of Science and Engineering. In 2009, he was chair of the Council of Scientific Society Presidents.

On behalf of OxyChem, Dr. Carroll chaired numerous committees for industry associations, including the American Chemistry Council and the Vinyl Institute. He has served on expert groups commissioned by the United Nations Environment Programme, the U.S. Environmental Protection Agency and three states, most recently the California Green Ribbon Science Panel.

He holds two patents, and has more than 65 publications in the fields of organic electrochemistry, polymer chemistry, combustion chemistry, incineration and plastics recycling.

Dr. Carroll has received the Henry Hill Award, sponsored by the ACS Division of Professional Relations, the Michael Shea Award from the Division of Chemical Technicians, Distinguished Alumni Awards from both Indiana and DePauw universities and the Vinyl Institute's Roy T. Gottesman Leadership Award. He is also the 2012 recipient of the Harry and Carol Mosher Award from the ACS Santa Clara Valley Section.

**Saturday morning: 8:30 – 9:30 a.m.**

*Education: Opportunities and our responsibilities in and out of the classroom*



**Bassam Z. Shakhashiri**  
*William T. Evjue Distinguished Chair  
for the Wisconsin Idea*  
University of Wisconsin-Madison  
Madison, Wisc.

Dr. Bassam Z. Shakhashiri is a native of Anfe, El-Koura, Lebanon. He emigrated to the U.S. with his parents and two sisters in 1957 when he was 17 years old, with one year of college already behind him. He earned his Bachelor of Science in chemistry from Boston University and Master of Science and Doctor of Science degrees in chemistry from the University of Maryland.

Referred to as the “dean of lecture demonstrators in America,” Dr. Shakhashiri is the first holder of the William T. Evjue Distinguished Chair for the Wisconsin

Idea at University of Wisconsin at Madison. He is well known internationally for his effective leadership in promoting excellence in science education at all levels and for his development and use of demonstrations in the teaching of chemistry in classrooms as well as in less formal settings, such as museums, convention centers, shopping malls and retirement homes. He is an advocate for policies to advance knowledge and the use science and technology to serve society. He promotes the exploration and establishment of links between science, the arts and the humanities, and the elevation of discourse on significant societal issues related to science, religion, politics, the economy and ethics. Dr. Shakhashiri was the 2012 president of the ACS and immediate past president in 2013. He is a national and international consultant to government agencies, academic institutions, industry and private foundations on policy and practice matters related to science and education at all levels.

Dr. Shakhashiri served as assistant director of the National Science Foundation (NSF) for Science and Engineering Education from 1984 to 1990. As the NSF chief education officer, he presided over the rebuilding of all the NSF efforts in science and engineering education after they had been essentially eliminated in the early 1980's. His leadership and effectiveness in developing and implementing national programs in science and engineering education have helped set the annual NSF education budget at its current level of more than \$900 million. His NSF strategic plan launched the systemic initiatives and most of the other NSF education programs of the last two decades.

Dr. Shakhashiri has given more than 1,400 invited lectures and presentations in North America, Europe, Asia, Australia, the Middle East and South America. He is the recipient of more than 35 awards and has received seven honorary doctoral degrees.




## FRIDAY, March 14, 2014

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- 8 a.m. – 5 p.m.      **Exhibits and Student Posters**
- 8 – 8:30 a.m.      **Registration, Refreshments, Exhibits and Student Posters**
- 8:30 – 8:45 a.m.      **Collin College Welcome and Opening Remarks, Pike Hall**  
Dr. Sherry Schumann, *Vice President/Provost*  
Collin College, Central Park Campus
- 8:45 – 9:45 a.m.      **Keynote Address I, Pike Hall**  
***Innovation in museums as gateways to engaging in science for all ages***  
Jennifer Scripps, *Vice President of Revenue Operations*  
Perot Museum of Nature and Science, Dallas, Texas
- 9:45 – 9:55 a.m.      **Refreshment Break, Exhibits and Student Posters**  
Conference Center
- 9:55 – 10:25 a.m.      **2YC3 General Membership Meeting, Pike Hall**
- 10:30 – 11:15 a.m.      **Parallel Presentation Session I**
- A. Getting started with undergraduate research the easy way (B107)  
*Heather Sklenicka, Rochester Community and Technical College  
Rochester, Minn.*
  - B. Transformative teaching and learning: From technology to teams (B113)  
*Cheryl Frech, University of Central Oklahoma, Edmond, Okla.*
- 11:20 a.m. –  
12:05 p.m.      **Parallel Presentation Session 2**
- A. How to maximize your teaching experience at a community college (B107)  
*Sammer Tekarli, Collin College, Preston Ridge Campus, Frisco, Texas*
  - B. What is new in the teaching of chemistry with social media at Wayne Community College? (B113)  
*Ashton Griffin, Wayne Community College, Goldsboro, N.C.*
- 12:05 – 1 p.m.      **Lunch Break, Exhibits, and Student Posters**
- 1 – 1:45 p.m.      **Parallel Presentation Session 3**
- A. Panel discussion: Acknowledging excellence in chemistry teaching and learning (B107)  
*Annemarie Ross, RIT/NTID, Rochester, N.Y.*
  - B. Correlation between different online homework systems, student success, and knowledge decay (B113)  
*Blain Mamiya, Independence Community College, Independence, Kan.*

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- 1:50 – 2:35 p.m. **Parallel Presentation Session 4**
- A. Student skills: Bridging the gap between student skills and employability (B107)  
*Mary C. Roslonowski, Eastern Florida State College, Melbourne, Fla.*
  - B. CASMNS: An interdisciplinary research program at the two year college level (B113)  
*Frederick Jury, Nelson Rich, and Cameron Neal  
Collin College, Spring Creek Campus, Plano, Texas*
- 2:35 – 3 p.m. **Refreshment Break, Exhibits and Student Posters**
- 3 – 3:45 p.m. **Parallel Presentation Session 5**
- A. Climate science is the answer, but what are the questions? (B107)  
*Robert Landolt, Texas Wesleyan University, Fort Worth, Texas*
  - B. Student preconceptions of chemistry laboratory (B113)  
*Joshua Sisk, University of Texas at Dallas, Dallas, Texas*
- 3:50 – 4:35 p.m. **Parallel Presentation Session 6**
- A. Tales of chemistry in Texas: The human element (B107)  
*Diana Mason, University of North Texas, Denton, Texas*
  - B. Programs in the NSF Division of Undergraduate Education that support creativity and innovation in STEM education (B113)  
*David Brown, National Science Foundation  
Division of Undergraduate Education, Arlington, Virg.*
- 4:35 – 4:50 p.m. **Refreshment Break, Exhibits and Student Posters**
-  50 – 4:35 p.m. **Parallel Presentation Session 7**
- A. Anyone can do it... the democratization of the distribution of educational tools (B107)  
*Mark Bishop, Monterey Peninsula College  
Chiral Publishing Company, Monterey, Calif.*
  - B. A spoonful of sugar makes the chemistry go down (B113)  
*John M. Richardson, Austin College, Sherman, Texas*
- 6:15 – 7 p.m. **Social Hour**
- 7 – 8:30 p.m. **Dinner Banquet and Keynote Address 2** (Patrizio Banquet Room)  
***The chemistry enterprise: Do we have a future, or what?***  
*William F. Carroll, Jr., Vice President of Industry Issues  
Occidental Chemical Corporation, Dallas, Texas*

## SATURDAY, March 15, 2014

- 8:30 a.m. – 4 p.m.  **Exhibits and Student Posters**
- 8 – 8:30 a.m. **Registration, Refreshments, Exhibits and Student Posters**
- 8:30 – 9:30 a.m. **Keynote Address 3, Pike Hall**  
**Education: Opportunities and our responsibilities in and out of the classroom**  
Bassam Z. Shakhashiri  
University of Wisconsin-Madison, , Madison, Wisc.
- 9:35 – 11:20 a.m. **Workshop Session I**
- A. Developing assessment for student skills: A Resources for Excellence workshop (B107)  
Heather Sklenicka, Rochester Community and Technical College  
Rochester, Minn.  
Olga Katkova, Western Nebraska Community College, Scottsbluff, Neb.
  - B. Greeks, geeks, and goofs: A collaborative catalyst for creativity in the classroom (B113)  
Mindi Bailey, Regina Hughes, and Dawn Richardson, Collin College,  
Preston Ridge Campus, Frisco, Texas
- 11:20 – 11:35 p.m. **Refreshment Break and Exhibits**
- 11:35 a.m. – 1:05 p.m. **Workshop Session 2**
- A. Climate change activities to enhance understanding (B112)  
Jerry Bell, University of Wisconsin-Madison, Madison, Wisc.
- 11:35 a.m. – 12:20 p.m. **Parallel Presentation Session 8**
- A. Two-year college chemistry: So far to have come, so far to go (B107)  
Kenneth Chapman, The Carmel School, Ruther Glen, Virg.
  - B. The stigma and reality of a community college education: A student's perspective (B113)  
Austin Tomanek, University of North Texas, Denton, Texas
- 12:20 – 1:05 p.m. **Parallel Presentation Session 9**
- A. Moving spectroscopy earlier in the organic I semester: A discussion (B107)  
C. Frederick Jury, Collin College, Spring Creek Campus, Plano, Texas
  - B. Using the ACS Assessment Tool for Chemistry in Two-Year College Programs: A panel discussion of first hand experiences (B113)  
Heather Sklenicka, , Rochester Community and Technical College  
Rochester, Minn.  
Thomas Jose, Blinn College, Bryan, Texas.

# Program



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## SATURDAY, March 15, 2014

1:05 – 2 p.m.

**Lunch Break and Exhibits**

2 – 3 p.m.

**Closing Presentation**

Using secrets of playwriting to teach chemistry in and out of the classroom

(Pike Hall)

*Holly W. Kerby, Madison Area Technical College, Madison, Wisc.*

3 – 3:15 p.m.

**Closing Remarks**

# Abstracts

**FRIDAY, March 14, 2014**

## **Opening Presentation – Keynote Address I** *Innovation in museums as gateways to engaging in science for all ages*

**Jennifer Scripps**

Vice President of Revenue Operations  
Perot Museum of Nature and Science  
Dallas, Texas

The new Perot Museum was created to be a community asset for highly-interactive and innovative science learning for all ages, and, in the process, has helped set a new standard of excellence for science museums in the 21st century. With a mission to “inspire minds through nature and science,” the Perot Museum is committed to making science accessible and fun. This presentation will share how the museum utilizes technology and a variety of external partnerships, both academic and corporate, to fulfill its ambitious vision of being the best place for informal science learning and successfully move the institution “from good to great.”

## **Presentation 1A**

### *Getting started with undergraduate research the easy way*

**Heather Sklenicka**

Rochester Community and Technical College  
Rochester, Minn.

Everywhere you look, there are people saying the earlier a student gets involved in research, the better off they are. What do you do when your college’s mission is not aligned with research, but you feel it is an important part of the education of students early in their career? Come find out how you can easily incorporate research experiences into classes and start a research course. Follow my seven-year journey to starting a research group at a two-year college. Steal my ideas, and start giving your students the rich experience of research.

## **Presentation 1B**

### *Transformative teaching and learning: From technology to teams*

**Cheryl Baldwin Frech**

University of Central Oklahoma  
Edmond, Okla.

Today’s instructors face students who may be under-prepared and are hard to motivate. We will examine both technology tools and classroom strategies that any

instructor can adopt to fit their students, classroom constraints, personality and given time constraints. Technology options include videos, pencasts and the creative use of assignments and classroom management systems. Team-based learning strategies require students to interact with the material and with each other in the classroom and do not require students to meet outside of regular class hours.

## **Presentation 2A**

### *How to maximize your teaching experience at a community college*

**Sammer Tekarli**

Collin College, Preston Ridge Campus  
Frisco, Texas

Whether one is working in a full-time or part-time capacity, the work experience at a community college should include more than the minimum requirements of the job. In this talk, a compiled list of opportunities is provided to enhance the work experience at a community college. With this startup list, one can provide service to the community college and the academic community at large.

## **Presentation 2B**

### *What is new in the teaching of chemistry with social media at Wayne Community College?*

**Ashton Griffin**

Wayne Community College  
Goldsboro, N.C.

Today’s students arrive in our chemistry classrooms with smartphones, laptops and tablets. Social media sites such as Facebook, Twitter, Google Plus and YouTube often compete for their attention. As chemistry faculty, we are asked to maintain faculty web pages and often utilize course management systems such as Blackboard or Moodle in our teaching.

But those of us who have embraced new social media trends have found that they allow us to better connect with our students and provide our students with a vast array of ways to learn more about chemistry and its place in society.

Over the last five years, I have utilized technology, social media, and now, a chemistry class smartphone app, to improve my teaching at the community college level. I can do the same thing for you. Join me in this presentation as I share some of the tips that worked best for me in this new social media-driven world.



## FRIDAY, March 14, 2014

### **Presentation 3A**

#### ***Acknowledging excellence in chemistry teaching and learning***

**Open-ended discussion of the needs for acknowledgement in the two-year college community - Panel discussion**

**Annemarie Ross**

RIT/NTID

Rochester, N.Y

At its annual meeting, the ACS Two-Year College Advisory Board discussed potential ways to acknowledge excellence in chemistry and chemistry-based technology education in two-year college programs. A panel will share the result of these discussions. Participants will provide feedback and input in the need for such a program and potential methods for recognizing excellence.

### **Presentation 3B**

#### ***Correlation between different online homework systems, student success and knowledge decay***

**Blain Mamiya**

Independence Community College

Independence, Kan.

Student success in chemistry requires students to learn problem-solving skills they normally do not possess when they enter a general chemistry one course. Many times, students solve problems using their misconceptions without the feedback needed to correct them. There are many different online homework systems, all designed to provide instant feedback to students when they have answered questions incorrectly and provide hints or suggestions to solve the problem correctly. This type of feedback helps students correct misconceptions before assessments, and thereby, increase student success in chemistry courses. But, what happens with content retention after several days have passed, like on the final exam? Will online homework be advantageous in preventing knowledge decay? Some systems appear to be better than others in helping students retain valid conceptions. This research investigated the correlation between the different online homework systems, knowledge decay and the effect on student success.

### **Presentation 4A**

#### ***Student skills: Bridging the gap between student skills and employability***

**Mary C. Roslonowski**

Eastern Florida State College

Melbourne, Fla.

Recent studies show an increasing gap between what skills faculty at two-year and four-year colleges think their students possess and what skills employers and recent graduates believe they possess. To bridge the gap between student skills, the two-year college advisory board implemented a "workshop in a box" strategy designed to bring all the stakeholders together to discuss this issue. The strategy, as well as results and lessons learned, will be discussed. Participants will also receive the materials to implement their own "workshop in a box" at their college, school or regional section.

### **Presentation 4B**

#### ***CASMNS: An interdisciplinary research program at the two year college level***

**C. Frederick Jury, Nelson Rich, and Cameron Neal**

Collin College, Spring Creek Campus

Plano, Texas

The Center for Advanced Studies in Mathematics and Natural Sciences (CASMNS) program at Collin College has been in existence for the last 10 years. It gives interested students the opportunity to try their hand at research and introduces the challenges and rewards of this type of activity. The talk will discuss the formation and evolution of the program highlighting some of our successes.

### **Presentation 5A**

#### ***Climate science is the answer, but what are the questions?***

**Robert Landolt**

Texas Wesleyan University

Fort Worth, Texas

It is crucial for the public to understand how energy use impacts the atmosphere and oceans in both the short and long term. A web-based 'toolkit,' designed to integrate the fundamental science that determines and regulates the Earth's climate, has been developed by the ACS for use by a wide cross-section of educators and the public. This

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presentation, tailored for community college science faculty audiences, will show how the toolkit addresses questions such as

- What is the evidence that Earth is warming?
  - What is the atmospheric greenhouse effect?
  - How are a warming Earth and increased greenhouse gases related?
  - Have human activities contributed to Earth's greenhouse gases?
  - What are feedbacks in the climate system?
  - How are oceans affected by the Earth's energy imbalance and by increasing atmospheric CO<sub>2</sub> levels?
- What role does chemistry play in climate science?

## **Presentation 5B**

### ***Student preconceptions of chemistry laboratory***

**Joshua Sisk**

University of Texas at Dallas  
Dallas, Texas

Most two-year college students enter the chemistry laboratory having taken chemistry in high school. Texas high schools are required to devote 40 percent of instructional time in chemistry to laboratory investigations. These previous experiences impact students' perceptions of the process of "doing chemistry". Chemistry students (n = 93) at a local high school were surveyed using the Science Laboratory Environment Inventory to determine their actual and ideal perceptions of student cohesiveness, open-endedness, integration, rule clarity and material environment in the laboratory environment. Students perceived that the student cohesiveness, rule clarity, and material environment of their actual environment were significantly less than their ideal environment. A qualitative approach involving student-generated descriptive words indicated that many students view chemistry as "boring." Additionally, teachers in the same school were surveyed about their perceptions of the laboratory environment. Teachers reported that laboratory activities were rarely student guided and expressed a lack of confidence in guiding students to designing their own laboratory experiments. It is this combination of cookbook laboratory expectations and lack of confidence in an inquiry based approach that creates our college chemistry students. Shifting to an inquiry-based approach has the potential to overcome the perception that chemistry is boring.

## **Presentation 6A**

### ***Tales of chemistry in Texas: The human element***

**Diana S. Mason**

University of North Texas  
Denton, Texas

Calling all Texans and those who got here as fast as you could! Have you ever heard that the best way to "sell" Texas is to sell it to Texans? Well, it is true! AND, the best way to teach chemistry is to teach about what is happening in your students' backyards. Yes, this is true, too! There is evidence that what determines when new learning will occur is based on prior knowledge, engagement and motivation. You must take into account the student's prior knowledge, but when you engage and motivate your students, they will have a much easier time developing into the learners that you desire. This presentation will explore the facts and folklore of Texas, as they relate to the study of chemistry and how general chemistry problems were developed. From drawing a line in the dirt to supposed visits by beings "not from this world" and various tragedies and triumphs—there's always a Texas connection to learning about chemistry in the Great State of Texas. What visitors can take from this lecture is how they can incorporate what happens in their state to engaging and motivating students in the study of chemistry.

## **Presentation 6B**

### ***Programs in the NSF Division of undergraduate education that support creativity and innovation in STEM education***

**David R. Brown**

National Science Foundation  
Division of Undergraduate Education  
Arlington, Virg.

This presentation will provide an overview of grant programs within the Division of Undergraduate Education (DUE) at the NSF that support undergraduate education in science, technology, engineering and mathematics (STEM). Information regarding the missions and emphases of DUE programs will be complemented with a discussion of the NSF Merit Review process and advice and resources for preparing competitive grant proposals. Sufficient time will be set aside for questions and answers and interactive dialog is highly encouraged.



**FRIDAY, March 14, 2014**

**Presentation 7A**

***Anyone can do it... the democratization of the distribution of educational tools***

**Mark Bishop**

Monterey Peninsula College, Chiral Publishing Company  
Monterey Institute of International Studies  
Monterey, Calif.

Because of the development of easy-to-use computer tools, easy access to the Internet for most students, and growing acceptance of electronic educational tools, including textbooks, it has become possible for individuals to develop and distribute educational materials without the aid of the large academic publishers. In my talk, I'll describe the evolution of my project, which includes two versions of my textbook (An Introduction to Chemistry) in several formats, including regular printed books and various forms on the Net: PDF, EPUB (for iPhones, iPads, and Android devices), MOBI for Kindle, and Flash-based PowerPoint-like presentations with me reading the text. I'll also briefly describe my book's many supporting tools, including animations, tutorials, online lectures, and more. All of these tools are freely available with no user names or passwords at preparatorychemistry.com. The main goal of my talk will be to explain how you can do some or all of the things I've done. I'll describe the tools you'll need, where you can get them at the lowest cost, and some idea of the time it will take to create your own materials..

**Presentation 7B**

***A spoonful of sugar makes the chemistry go down***

**John M. Richardson, III**

Associate Professor of Chemistry, Austin College  
Sherman, Texas

Getting students to recognize the daily interactions that they have with chemistry and the knowledge gained from lecture is often difficult. However, chemistry is ubiquitous and nowhere is this more evident than in the daily transformations taking place in our kitchens. The philosophy of molecular gastronomy is to increase knowledge of what so ever concerns man's nourishment, serves as a mechanism to generate excitement for learning and an avenue of active investigation. In lecture students are introduced to a full complement of scientific ideas and chemistry through the medium of food and the process of cooking. Course topics include properties of matter, thermochemistry, intermolecular forces, kinetics,

equilibrium, acids & bases, and biochemistry. Inclusion of practical applications of conventional and some unconventional cooking techniques as part of the laboratory components give students the ability to replicate and investigate science at home. Once engaged the students are easily led to application of the scientific method as a mode to investigate questions. Starting with experiments designed to test common household cooking proverbs and eventually leading to novel avenues of investigation by the students. By taking the topics perceived as difficult, wrapping them in a layer of the familiar and reinforcing with hands on demonstrations, students have the opportunity to come away with a knowledge base that increases the retention and appreciation of chemistry.

**Banquet Presentation – Keynote Address 2**

***The chemistry enterprise: Do we have a future, or what?***

**William F. Carroll, Jr., Ph.D.**

VP of Industry Issues  
Occidental Chemical Corporation  
Dallas, Texas

The Chemistry Enterprise is globalizing, which means changes for chemistry in the U.S. Whether it relates to the shift in pharmaceutical chemistry from small molecules to very large, the commoditization of specialty chemicals, or natural gas pricing, we are in a period of sea change for the chemical industry in the U.S. For colleges, the operating costs and sources of professors and students will drive the health of chemistry higher education. Two-year colleges face similar but different constraints on resources. How do we prepare our current and future members, those who are employed or those who hope to be, for the future state of chemistry? The answer lies in our education, personal marketing and interaction with a simultaneously shrinking globe and expanding network.

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## SATURDAY, March 15, 2014

### **Opening Presentation – Keynote Address 3** ***Education: Opportunities and or responsibilities*** ***in and out of the classroom***

**Bassam Z. Shakhshiri**

Professor of Chemistry

2012 President, American Chemical Society

William T. Evjue Distinguished Chair for the Wisconsin Idea

Director, Wisconsin Initiative for Science Literacy

University of Wisconsin-Madison

Madison, Wisc.

Chemistry teachers can play significant roles in and outside the classroom, in their immediate environment, the department and school/college/university, in the community of scholars in education arenas, in the local, regional, national and international chemistry communities, in the cities and states where they live and both nationally and internationally. Teachers make major contributions in different phases of their careers, to a range of different audiences. The technical classroom education teachers and professors provide is essential, but we all have so much more to offer, and we should be doing so. Today, our biggest challenge is to help sustain Earth and its people in the face of population growth, finite resources, malnutrition, spreading disease, deadly violence, war, climate change and the denial of basic human rights, especially the right to benefit from scientific and technological progress. Purposeful communication of the critical role of science and technology in society can help alter attitudes of the general public.

### **Presentation 8A**

#### ***Two-year college chemistry: So far to have come,*** ***so far to go***

**Kenneth Chapman**

American Chemical Society (retired)

The Carmel School, Upper School Science Teacher

Cardinal Workforce Developers, LLC, Principal Partner

Ruther Glen, Virg.

The presenter hosted the fourth conference in the 2YC3 series. Since then, the environment for two-year college chemistry has changed from being viewed with suspicion and disrespect to being accepted as a legitimate component of chemistry education in higher education. Yet, chemistry in two-year colleges has not reached its potential, even as it becomes central to more workplace materials and disciplines. Recent U.S. presidents have recognized the importance of two-year colleges to developing the nation's

workforce. With MOOC and varied digital media as competition/assets, perspectives about the future and entrepreneurship in two-year college chemistry from 50+ years of work for two-year college chemistry and instructional media, in and out of the classroom, will be presented.

### **Presentation 8B**

#### ***The stigma and reality of a community college*** ***education: A student's perspective***

**Austin Tomanek**

University of North Texas

Denton, Texas

The presentation will be a personal, retrospective and observational study of a community college education through the eyes of an alumnus, highlighting the differences between a university and a community college. Topics include professorship, learning community and student life. There is a need for professors to have a stronger influence in academic advising, especially with students wanting to take "difficult" science classes. The learning process has many different facets, sometimes requiring students to stumble on their own. Creativity requires knowledge of a subject and it is not the act of learning. Kinesthetic learning in an advanced, technological and visual world remains under developed. My personal research has real-world applications of general chemistry and organic chemistry, stemming from studying the effects of the triple point of water to induce DNA uptake on biological systems, specifically, algae. My presentation will conclude with my future plans concerning education and how I believe the process of acquiring knowledge will change in the next fifty years.

### **Presentation 9A**

#### ***Moving spectroscopy earlier in the organic I*** ***semester: A discussion***

**C. Frederick Jury**

Collin College, Spring Creek Campus

Plano, Texas

Organic textbooks always place the topic of spectroscopy around chapters 12-14. Some feel the topic could be leveraged to help students with some of the fundamental concepts at the beginning of the course. You are invited to bring your ideas and examples for using spectroscopy earlier in the organic course.

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**SATURDAY, March 15, 2014**

## **Presentation 9B**

***Using the ACS Assessment Tool for Chemistry in Two-Year College Programs: A panel discussion of first hand experiences***

***Heather Sklenicka***

Rochester Community and Technical College  
Rochester, Minn.

***Thomas Jose***

Blinn College  
Bryan, Texas

The process of identifying strengths and potential areas for improvement in any two-year program has a variety of purposes, including internal evaluation, support for funding requests, documentation for accreditation procedures and so on. Additionally, academic institutions are facing increasing pressure to conduct self-evaluations and document the results.

In response, ACS recently released the ACS Assessment Tool for Chemistry in Two-Year College Programs. Developed over three years with teams comprised mostly of two-year college chemistry faculty, the self-study tool facilitates self-evaluation by providing a platform for the documentation of strengths and indicating areas for improvement. Results from pilot studies of the assessment tool indicate that it is a useful resource for a variety of two-year college programs and curricula.

This presentation will briefly explain the development of the assessment tool and the results of a two-stage pilot study. Experiences of faculty involved in all stages of implementation will be shared in this panel discussion.

## **Closing Presentation**

***Using secrets of playwriting to teach chemistry in and out of the classroom***

***Holly W. Kerby***

Madison Area Technical College  
Madison, Wisc.

Playwrights know principles and tools that allow them to write plays that capture attention, make connections, build suspense and, best of all, motivate and support learning. This talk will present techniques extracted from playwriting and applied to teaching chemistry in the community college classroom. It will also introduce the work of Fusion Science Theater, a NSF-funded project that uses these techniques to design outreach shows that teach chemical concepts to children 5-11 years.



## **Workshop 1A**

### ***Developing assessment for student skills: A resources for excellence workshop***

**Olga Katkova**

Western Nebraska Community College  
Scottsbluff, Neb.

In this workshop we will brainstorm how to assess student skills. Participants will leave with a simple tool that will assess one skill found in the ACS Guidelines for Chemistry in Two-Year College Programs. The skills found in the guidelines are problem solving, chemical literature, laboratory safety, communication, team and ethics. Come with an idea of what student skill you would like to assess, and in small groups we will develop the tool.

## **Workshop 1B**

### ***Greeks, geeks, and goofs: A collaborative catalyst for creativity in the classroom***

**Mindi Bailey, Regina Hughes, and Dawn Richardson**  
Collin College, Preston Ridge Campus  
Frisco, Texas

Regardless of one's career path, success increasingly depends on the ability to think not only critically but also creatively, the ability to adapt to a constantly and rapidly changing environment. In essence, training the brain to acquire and organize information in an educational setting yields not only better learning outcomes but also increased memory retention and innovation.

Drawing from contemporary research in brain science, cognitive psychology and memory, this workshop provides scaffolding for curriculum design and development that aims to enhance the learning experience by spotlighting effective cognitive strategies used by great thinkers as well as noteworthy mistakes that spawned significant scientific discoveries and inventions.

Although the basic information presented in this workshop pertains to all domains of knowledge, the goal of the presenters is to specifically target chemistry classrooms and curriculum by providing suggestions for tackling some of the major challenges faced by chemistry students and teachers alike.

This interactive workshop seeks to help chemistry professors orchestrate curriculum to most effectively maximize memory, minimize test anxiety and facilitate lessons without sacrificing the rigor and rapid-fire pace inherent in chemistry courses. Attendees at this workshop will learn how to assuage students' fear of failure and mistakes, to structure study time/place most efficiently, and to organize and recall information most effectively.

## **Workshop 2**

### ***Climate change activities to enhance understanding***

**Jerry Bell**

Simmons College, Professor of Chemistry (emeritus)  
American Chemical Society, Senior Scientist (retired)  
Wisconsin Initiative for Science Literacy, Faculty Associate  
Madison, Wisc.

Earth's climate has changed as human activities have released substantial amounts of greenhouse gases, carbon dioxide in particular, into the environment. This workshop will focus on two aspects of the properties of carbon dioxide—its interaction with electromagnetic radiation, hence planetary warming, and its aqueous chemistry, hence ocean acidification, that are too often neglected in climate change discussions. Interactive activities/experiments exemplifying these properties and discussion of their connection to climate change are the basis of the workshop. Engaging students and other audiences in activities that make concepts more concrete enhances conceptual understanding.

**Poster 1*****Electrochemical determination of acetaminophen in Tylenol***

**Ha Young Kim, Gezahegn T. Chaka**  
Collin College, Spring Creek Campus  
Plano, Texas

Acetaminophen (4-acetamidophenol) is the active ingredient in several over-the-counter pain relief medications. This experiment used an electrochemical technique known as cyclic voltammetry to determine the concentration of acetaminophen in Tylenol. A stock solution of acetaminophen was prepared in an acid buffer solution and a calibration curve was developed. Then a Tylenol test solution was prepared for the electrochemical determination of the concentration of acetaminophen using cyclic voltammetry. The method used in this research successfully determined acetaminophen by using phosphoric acid instead of the more hazardous concentrated perchloric acid in sample preparations.

**Poster 2*****Selective extraction of Cu<sup>2+</sup> in the presence of Fe<sup>3+</sup>, Co<sup>2+</sup>, and Ni<sup>2+</sup> using ligands in aqueous solutions***

**Mubanga Musonda, Andy Shih, Gezahegn T. Chaka**  
Collin College, Spring Creek Campus  
Plano, Texas

Quantitative and selective extraction of heavy metal cations is of a significant importance in environmental and biological systems. The molar absorptivity values and the stability constants of the copper-ligand complexes were determined in aqueous solutions. Based on the stability constants of the heavy metal-ligand complexes, an attempt was made to selectively extract copper (II) ion using the [14]aneS4 ligand (1,4,8,11-tetrathia cyclotetradecane) and the [14]aneN4 ligand (1,4,8,11-tetraazacyclotetradecane) in aqueous solution. The extent of extraction of copper(II) was determined by spectrophotometry method. Both ligands showed selectivity towards copper (II) ions. The macrocyclic ligand 1,4,8,11-tetrathia cyclotetradecane was found to extract the copper(II) ions more effectively.

**Poster 3*****Using molecular markers to assess population genetic structure in Limestone Adder's-tongue (Ophioglossum engelmannii), an unusual fern species***

**Dana Abusalah, Juan Arreguin, Chris Doumen, Bridgette Kirkpatrick, David McCulloch, Nelson Rich**  
Collin College, Spring Creek Campus  
Plano, Texas

Ophioglossum engelmannii (Limestone Adder's-tongue) is a member of a fern family (Ophioglossaceae) characterized by subterranean, bisexual gametophytes possessing both sperm and egg producing structures on the same individual. It has been suggested that due to the limited distance sperm can swim, the subterranean habit may prevent outcrossing between gametophytes and promote inbreeding. Analysis of isozyme variation has supported the occurrence of inbreeding in some species of this family. However, more recent studies using DNA-based markers to assess population genetic structure in other species of Ophioglossaceae report greater genetic variation than expected. No studies have been conducted to assess genetic variation of Limestone adder's-tongue. This study was conducted to: (1) confirm species identity using a chloroplast coding sequence (rbcL) and (2) assess genetic variation within and between populations of a Limestone Adder's-tongue chloroplast non-coding sequence (trnL-F). A BLAST search using rbcL confirmed species identity. Analysis of trnL-F sequences indicated no variation within or between populations and supports the hypothesis of limited genetic variation within this species. However, the small distance between populations in our study does not exclude the possibility of variations between populations separated by greater distance.

## Posters

### Poster 4

#### ***Identification of Lombricine Kinase in the Oligochaete Enchytraeus through PCR and cDNA analysis***

**Ashley Huntsberry and Chris Doumen, Ph.D**

Collin College, Spring Creek Campus

Plano, Texas

Phosphagen Kinases (PKs) are a family of enzymes that catalyze metabolic equilibrium reactions in animals and are important in stabilizing the cellular ATP/ADP ratios during increased energy demands. Whereas vertebrates are characterized by Creatine Kinase, the invertebrates contain a variety of PKs with the greatest variety seen in the Annelid Phylum. Information on Oligochaetes comes from enzymatic analysis and molecular confirmation is scant. This study presents evidence for the existence of Lombricine Kinase in *Enchytraeus*, a small terrestrial Oligochaete. Using PCR and RACE technology, a 990 bp cDNA sequence was obtained, from which the deduced amino acid sequence allowed comparisons with other PKs. Additional data will be presented with respect to the location/size of the introns in the genomic DNA. The data provides further confirmation that Lombricine Kinase is the typical PK in the Oligochaetes.

### Poster 5

#### ***The molecular identification of urban coyotes (Canis latrans) using species-specific primers***

**Jessica Lyon and David L. McCulloch**

Collin College, Spring Creek Campus

Plano, Texas

Surveying urban mammals is problematic since populations are low in density, occupy fragmented habitats and as secretive species are difficult to detect. Traditional mark-recapture methods may not be appropriate or adequate. Non-invasive genetic sampling is an effective ecological tool for studying populations under these conditions. Such sampling typically involves the extraction of mtDNA from hair or scat, PCR amplification, and enzymatic digestion of the amplified product. Species identification is then made from the resulting restriction fragment profiles. This study presents an alternative method that uses computer generated species-specific primer pairs for identification, eliminating the cost and time of using restriction endonucleases. With this method, we successfully distinguished coyote (*Canis latrans*) scat from that of other common North Central Texas urban predators.

### Poster 6

#### ***Perceptual learning of 3D chemical structure and adaptive learning of basic chemistry nomenclature***

**Amina El-Ashmawy**

Collin College, Central Park Campus

McKinney Texas

**Arlene Russell, Everett Mettler, Tim Burke, Philip Kellman**

University of California

Los Angeles, Calif.

**Christine Massey**

University of Pennsylvania

Philadelphia, Pa.

Two web-based learning modules were designed to aid students taking general chemistry courses at a community college. One module, 'Chem 3D', targeted 'perceptual learning', or the pickup of chemical structure, across three forms of chemical representation. In Chem 3D, students were asked to identify bond angles and hybridization of various compounds. Results showed that students using the module had learning gains at immediate and delayed post-tests. In addition, where mastery criteria were also partially based on response-time, fluency gains were maintained across a delay. A second module, 'Chemistry Nomenclature' targeted the learning of basic chemistry nomenclature: ionic compounds and acid naming. An adaptive scheduling algorithm calculated the order of presentation for each item as a function of each student's response speed and accuracy. Learning gains were present at immediate and delayed post-tests.



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**Collin College Police Department**

The planning team wishes to thank our wonderful keynote speakers, presenters, workshop facilitators, and all conference attendees. We hope this conference provides you with the spark to ignite creative and innovative pedagogy and research with your students.







# Notes



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## Banquet Details

**Patrizio**  
**101 Fairview Station Pkwy**  
**Fairview, Texas 75069**  
**972-363-2101**

**Directions from campus:**  
Exit campus parking by making a left at Community Drive. Turn left (east) on University Drive. Turn right (south) onto US-75. Take exit 37, and turn left onto E. Stacy Road. Take the first left onto Fairview Station Pkwy. Restaurant will be on the left.