SAN DIEGO CITY COLLEGE AND 2YC3 Two-Year College Chemistry Consortium

PRESENT

the 213th 2YC3 Conference

Teaching Chemistry through its Social Impacts

San Diego City College
March 11 – 12, 2016

Conference Organizers

Nancy Crispen
Shane Haggard
Robert Kojima
San Diego City College

Joann Um
Southwestern College

Haim Weizman
University of California, San Diego

Conference Sponsors

We would like to thank the following for their monetary donations that helped make this conference possible. Special thanks to VWR and McGraw-Hill as our primary sponsors. Please thank all of them personally when visiting their table.

Welcome!

On behalf of the Organizing Committee, I am truly honored and excited to welcome you to San Diego City College for the 213th Two-Year College Chemistry Consortium Conference. Our theme, "Teaching Chemistry through its Social Impacts" was inspired by City College's continued commitment to social justice issues.

I am confident that you will find that our program chairs have curated a rousing lineup of talks and workshops. Thank you for attending and being an integral part of this important national exchange of ideas - there are over 30 states represented here this weekend! We wish you a fulfilling and informative conference and a memorable stay in America's Finest City.

Robert Kojima
Local Arrangements Chair
213th $2YC_3$ Conference

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Technical Program

Friday Morning, March 11

8:00 − 9:00AM **Registration, Refreshments, Exhibits**
Registration: Science Building, 2nd floor foyer
Refreshments and Exhibits: Science Building, Room S-212

9:00 − 9:15AM **Welcome**
Anthony E. Beebe, Ed.D.
President, San Diego City College
Science Building, Room S-113

9:15 − 10:15AM **Keynote Address I**
Content or Context? Both.
Cathy Middlecamp
University of Wisconsin-Madison
Editor in Chief, Chemistry in Context (7th − 9th Ed.)
2016 Chair, ACS Division of Chemical Education
Science Building, Room S-113

10:15 − 10:45AM **2YC$_3$ Membership Meeting**
Tamika Duplessis
Delgado Community College
2YC$_3$ 2016 Chair
Science Building, Room S-113

10:45 − 11:15AM **Refreshment Break and Exhibits**
Science Building, Room S-212

11:15 − 11:50AM − Parallel Presentation Session I

I−A ***When Will I Ever Use This Stuff? Chemistry's Intrinsic Link to Societal Issues***
Scott Donnelly, Arizona Western College
Science Building, Room S-214

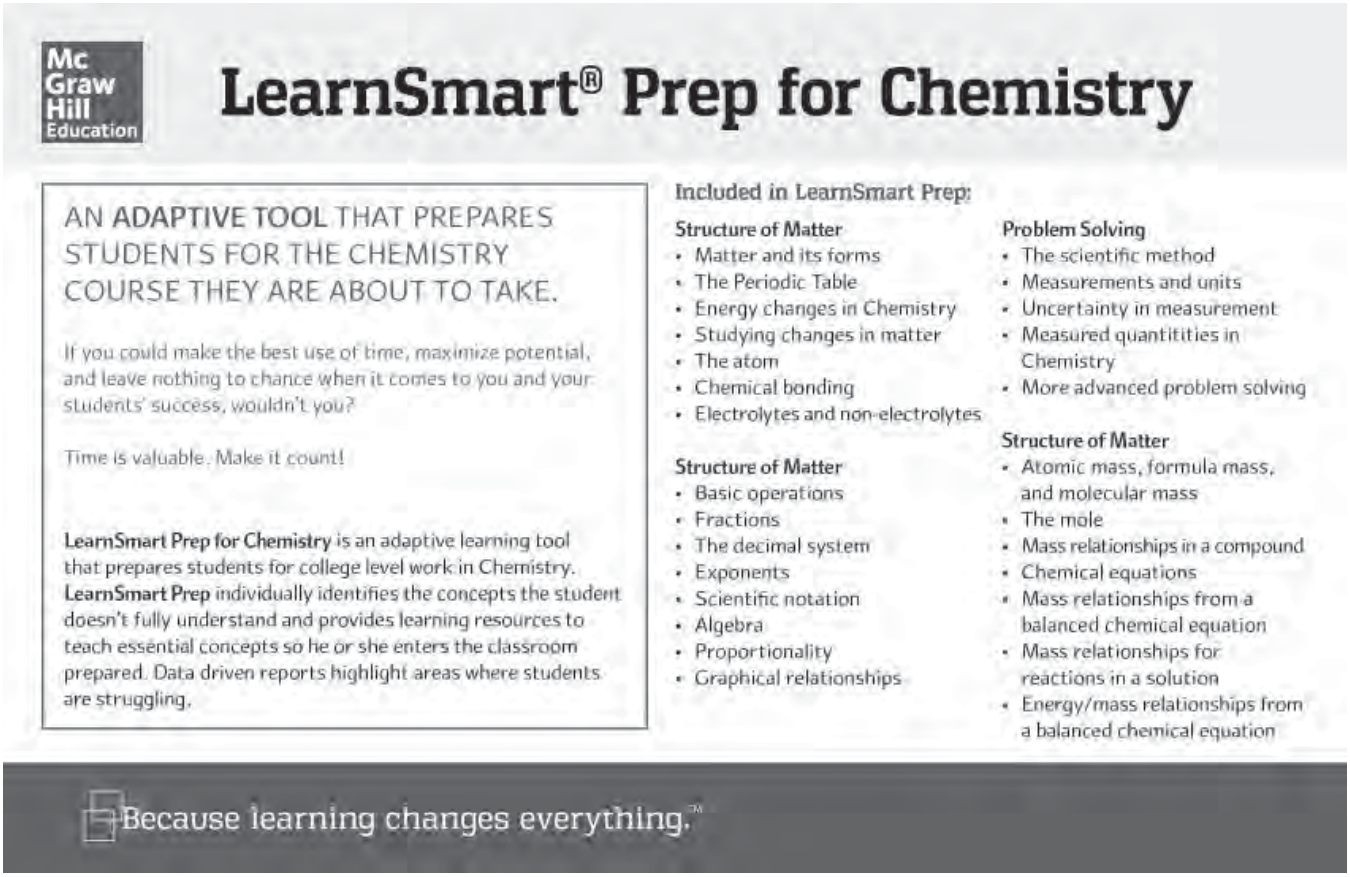
I−B ***Periscoping Your Way Through General Chemisty***
Ashton Griffin, Wayne Community College
Science Building, Room S-216

I−C ***Mixed-Methods Study of Online and Written Organic Chemistry Homework***
Philip Janowicz, McGraw-Hill Education
Science Building, Room S-112

11:55AM – 12:30PM – Parallel Presentation Session II

II–A ***Chemical Weapons and How They Can Provide Examples When Teaching Various Topics in Beginning Chemistry Courses***
Mark Bishop, Monterey Peninsula College
Science Building, Room S-214

II–B ***Reflective Journals in Chemistry Classes***
Olga Katkova, Truckee Meadows Community College
Science Building, Room S-216



Friday Afternoon, March 11

12:30 − 1:30PM **Lunch Break and Exhibits**
Lunch: Science Building, Room S-113
Exhibits: Science Building, Room S-212

1:30 − 2:05PM − Parallel Presentation Session III

III−A ***Chemistry on the Small Screen: A Discussion of the Chemical Aspects of the Movies and TV***
Robert Killin, Arizona Western College
Science Building, Room S-214

III−B ***Tips & Tools for the Online/Hybrid Chemistry Classroom***
Kathy Carrigan, Portland Community College
Jon Gittins, Delta College
Science Building, Room S-216

2:10 − 2:45PM − Parallel Presentation Session IV

IV−A ***Teaching Sustainability in the Chemistry Classroom***
Julie Ellefson and Joe Wachter, Harper College
Science Building, Room S-214

IV−B ***Multimodal Approaches to Teaching Organic Chemistry***
Shadi Assaf, Olive Harvey College
Science Building, Room S-216

IV−C ***Who Says Not Everyone Can Go To College?***
Dave White and Shane Haggard, San Diego City College
Jolie Pickett, Camille Fowler, and Denise Perez, Garfield High School
Science Building, Room S-112

2:50 − 3:30PM − Facilites Demonstration Session

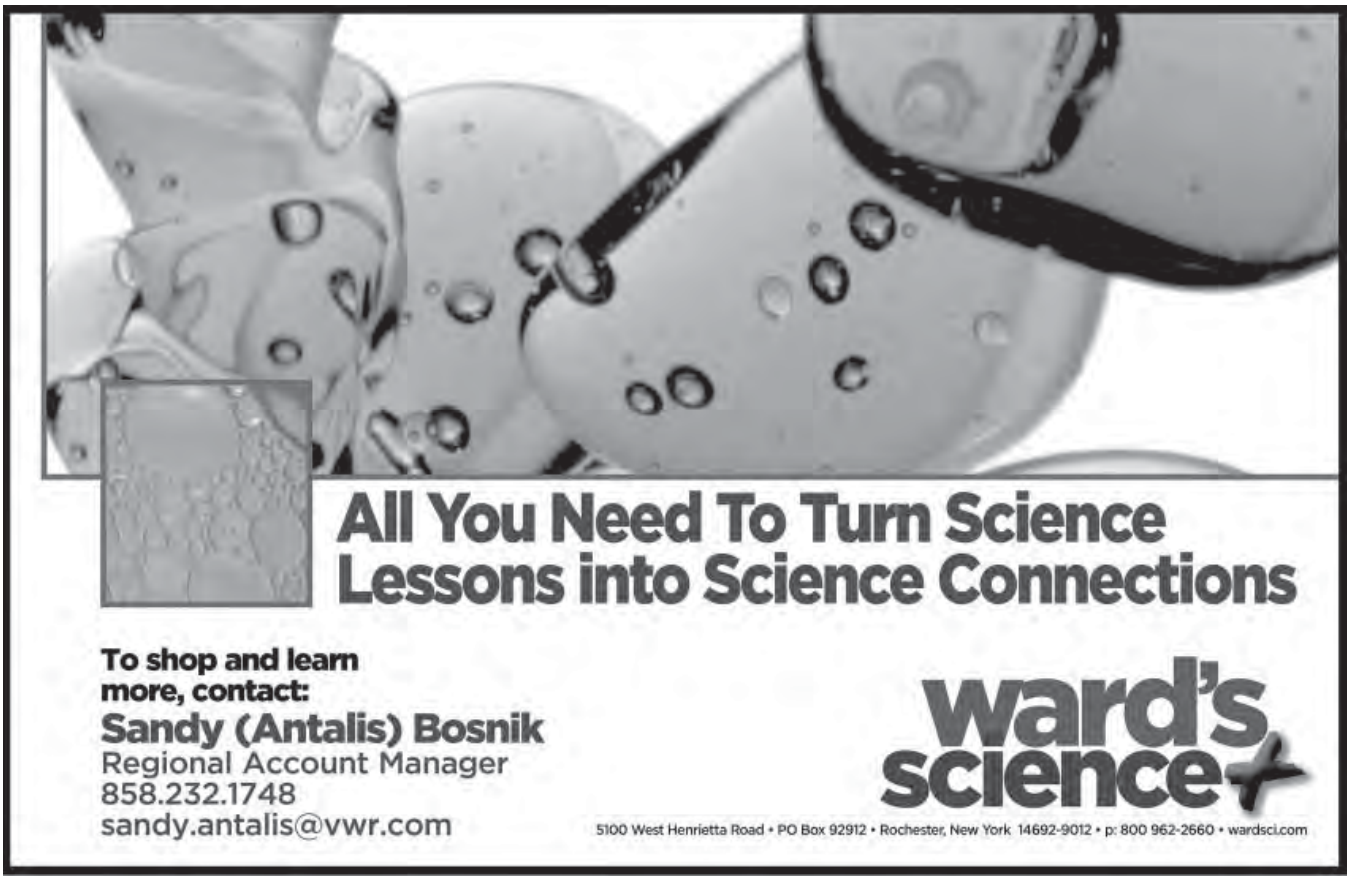
FC−1 ***Astrochemistry Tour of the Cosmos***
Lisa Will
San Diego City College and Reuben H. Fleet Science Center
Science Building Planetarium; S-316 (not on map, located on 3rd Floor)

FC-A ***Tour of Facilities***
Nancy Crispen
San Diego City College, Physical Sciences Department Chair
Meet in Science Building, Room S-214

3:30 – 4:00PM **Refreshment Break and Exhibits**
Science Building, Room S-212

4:00 – 5:00PM **Keynote Address II**
From Floods to Drought: How Aerosols Impact Our Climate
Kimberly Prather
University of California, San Diego
Science Building, Room S-113

6:00 – 8:00PM **Banquet**
Tickets may still be available for this event. Please contact Robert Kojima (Local Arrangements Chair) if you are interested.
Bandar Restaraunt (Map on Page 15)
845 4th Avenue
San Diego, CA 92101
(619) 238-0101



Saturday Morning, March 12

8:00 – 8:30AM **Registration, Refreshments, Exhibits**
Registration: Science Building, 2nd floor foyer
Refreshments and Exhibits: Science Building, Room S-212

8:30 – 9:30AM **Keynote Address III**
Core Praxis Model for a Learning Culture
Rafael Alvarez, San Diego City College MESA Program Director
Katya Echazarreta, Nate Wyley, and Luis Garcia, San Diego City College
Science Building, Room S-113

9:35 – 10:10AM – Parallel Presentation Session V

V–A ***NSF Programs for Community Colleges***
Tom Higgins, National Science Foundation Division of Undergraduate Education
Science Building, Room S-214

V–B ***A New California Chemistry Diagnostic Test***
Ram Subramaniam, De Anza College
Science Building, Room S-216

V–C ***Teaching Organic Instrumentation Using Inquiry Learning***
Faith E. Jacobsen, Johnson County Community College
Science Building, Room S-112

10:15 – 10:50AM **Refreshment Break and Exhibits**
Science Building, Room S-212

10:50 – 11:25AM – Parallel Presentation Session VI

VI–A ***A Model for Authentic Embedded Investigative Laboratory Curriculum at a Two-Year College***
Kalyn Shea Owens and Ann J. Murkowski, North Seattle College
Science Building, Room S-214

VI–B ***Using Machine-Learning Technology Tools to Map Test Items to a "Big Ideas" Framework***
Thomas Holme, Iowa State University
Kristen Murphy, University of Wisconsin-Milwaukee
Science Building, Room S-216

VI–C ***E-Texts in the 21st Century***
Ketan Trivedi, Virginia Tech Research Center
Science Building, Room S-212

11:30AM – 12:30PM – Workshop Session

WK-A ***Get a Jump Start Using the ACS Assessment Tool for Chemistry in Two-Year College Programs: A Resources for Excellence Workshop***
Olga Katkova, Truckee Meadows Community College
Amy Jo Sanders, Stark State College
Science Building, Room S-214

WK–B ***Addressing Student Misconceptions with Molecular-Level Visualization and Simulation***
Jurgen Schnitker, Wavefunction, Inc.
Science Building, Room S-216

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Saturday Afternoon, March 12

12:30 – 1:30PM **Lunch Break and Exhibits**
Lunch: Science Building, Room S-113
Exhibits: Science Building, Room S-212

1:30 – 2:05PM – Parallel Presentation Session VII

VII–A ***Lessons from Cognitive Science and Your Introductory Chemistry Classroom***
Laura Frost, Florida Gulf Coast University
Science Building, Room S-214

VII–B ***Undergraduate Research at a Community College***
David Hecht, Southwestern College
Science Building, Room S-216

VII–C ***Chemistry Connections for Community College Students (4 C's) at UC San Diego: An NSF-REU Program***
Haim Weizman and Stacey Brydges, University of California, San Diego
Science Building, Room S-112

2:10 – 2:45PM – Parallel Presentation Session VIII

VIII-A ***Using Case Studies from Current Events in General Chemistry Laboratories to Engage Students with their Environment***
Tracy J. Terry, University of New Mexico – Valencia
Science Building, Room S-214

VIII-B ***Textbooks in Transition: It's All About Options***
Mark Bishop, Monterey Peninsula College
Science Building, Room S-216

VIII-C ***A Collaborative Approach to Incorporating Undergraduate Research and MALDI-TOF Mass Spectrometry Into a Two-Year College***
Andrew Aspaas, Anoka-Ramsey Community College
Science Building, Room S-112

2:50 – 3:50PM **Keynote Address IV**
The Importance of Two-Year to Colleges Efforts to Diversify the STEM Professional Workforce
David R. Brown, Southwestern College
Science Building, Room S-113

3:50 – 4:00PM **Closing Remarks**
Science Building, Room S-113

Conference Exhibitors

We would like to thank the following for exhibiting at the 213th 2YC$_3$ conference. We encourage all attendees to visit their tables in room S-212 during the conference.

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Keynote Abstracts

Keynote Address I

Content or Context? Both.

Cathy Middlecamp
University of Wisconsin-Madison

General chemistry courses are tasked with providing a vital foundation for future courses. Do they? The very act of "covering" a large amount of content may create the conditions under which students find it difficult to learn this content. Evidence suggests that disjointed or piecemeal facts about any field, including chemistry, are unlikely to provide deep conceptual understanding.

Can teaching through the social impacts of chemistry help? Yes, if the learning of chemistry is carefully sequenced. For example, the real-world contexts of air quality, stratospheric ozone depletion, and global climate form a time-tested sequence in 8 editions of Chemistry in Context, a project of the American Chemical Society. These three real-world contexts are rich both in chemical knowledge and in social impacts. This presentation uses air quality, ozone depletion, and climate change to illustrate more generally how real-world contexts can engage students in learning chemistry.

Keynote Address II

From Floods to Drought: How Aerosols Impact Our Climate

Kimberly Prather
University of California, San Diego

Dr. Prather's presentation will focus on improving our understanding of how humans are influencing our atmosphere and climate. She will describe the use of aerosol time-of-flight mass spectrometry (ATOFMS) for the on-line characterization of the size and chemical composition of atmospheric aerosols and how these studies are being used to determine which aerosol sources play the largest role in affecting key atmospheric processes such as heterogeneous reactions, cloud formation, and ice nucleation. The ultimate goal of these studies is to gain a better understanding of the role aerosols play in climate change.

Keynote Address III

Core Praxis Model for a Learning Culture

Rafael Alvarez, San Diego City College MESA Program Director
Katya Echazarreta, Nate Wyley, and Luis Garcia, San Diego City College

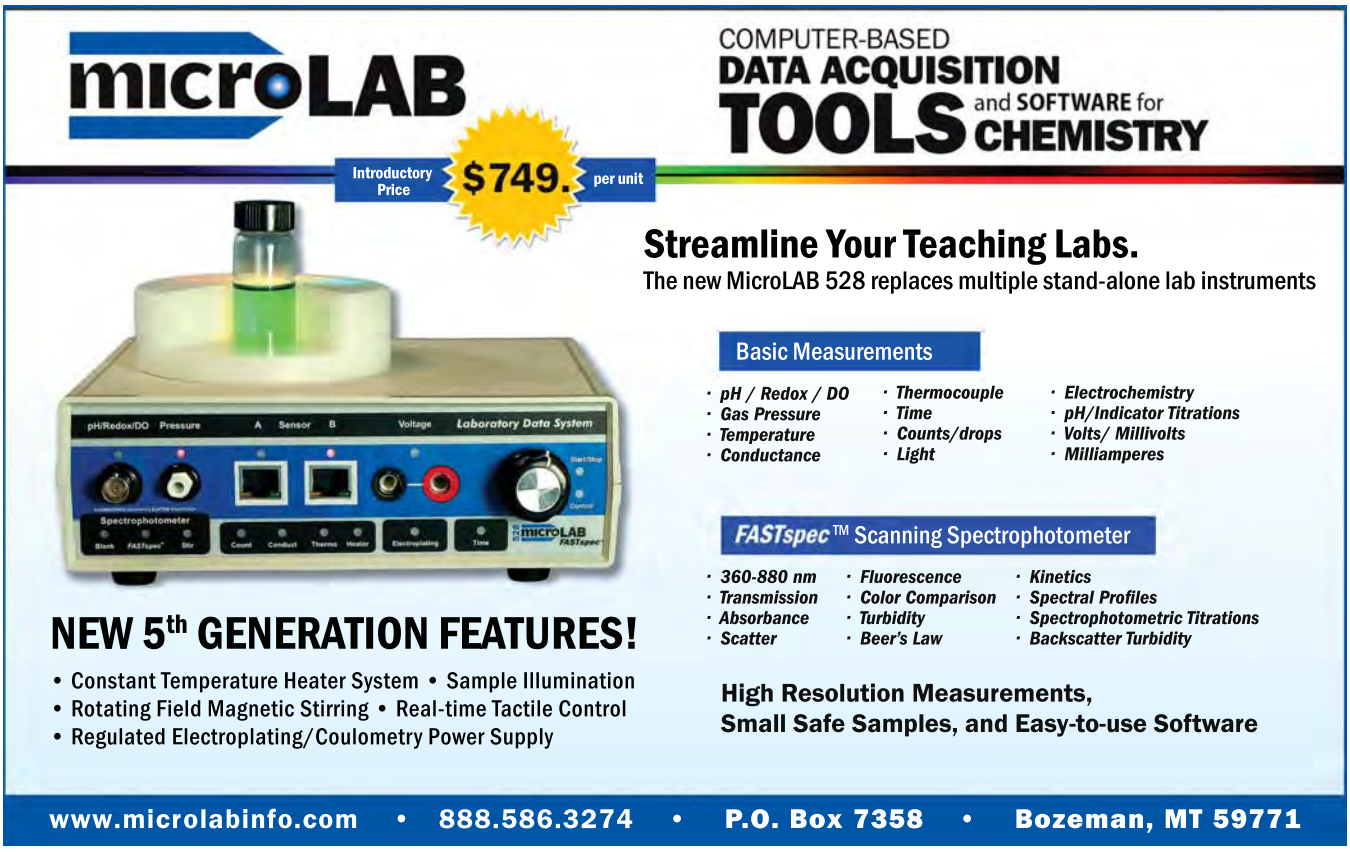
Student success in higher education is dependent on many factors, including a student's college preparation and academic and social integration in the college environment. Yet more importantly, student success depends on a student's working knowledge of the post-secondary learning culture. Using an inquiry approach, this presentation will address each element in the Core Praxis Model for a Learning Culture, a strategy for enhancing student success based on the praxis in the San Diego City College Mathematics, Engineering, Science Achievement (MESA) Program.

Keynote Address IV

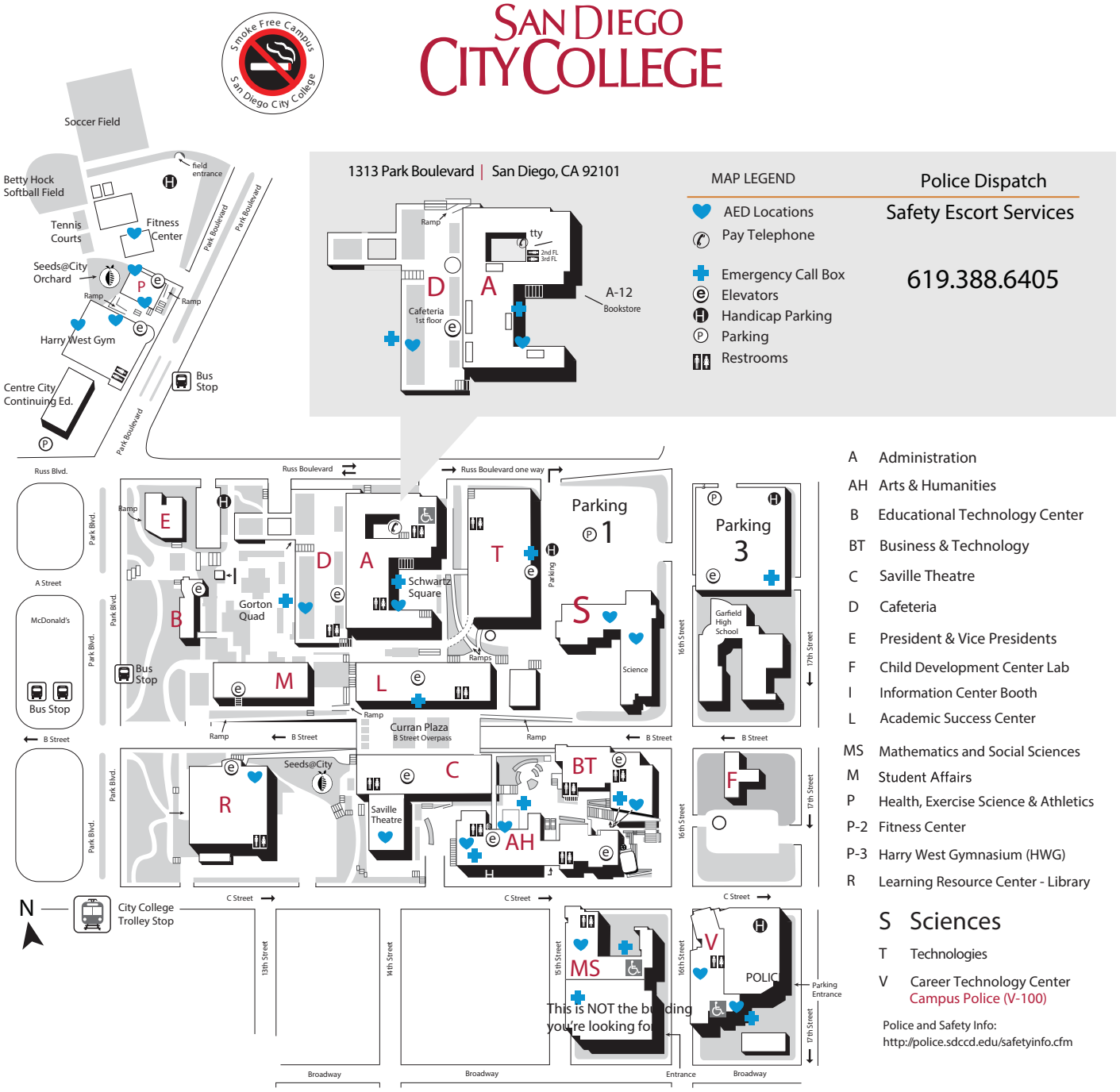
The Importance of Two-Year Colleges to Efforts to Diversify the STEM Professional Workforce

David R. Brown
Southwestern College

Educators, policy makers, economists, politicians and a host of others have touted the contributions made by the nation's two-year colleges to serve students from diverse populations. However, such discussions are often anecdotal and qualitative in nature, leaving one to wonder what the origins of those claims may be. This presentation will provide a forum to explore quantitative data that clearly demonstrate the proportion of undergraduate education provided by community and technical colleges and how it impacts students from populations historically underrepresented in STEM. Further, it will offer an examination of racial and ethnic inequalities that are propagated from secondary schools to higher education and ultimately into the STEM workforce, underscoring the critical roles two-year colleges play in endeavors to diversify the STEM professional workforce



Campus Map

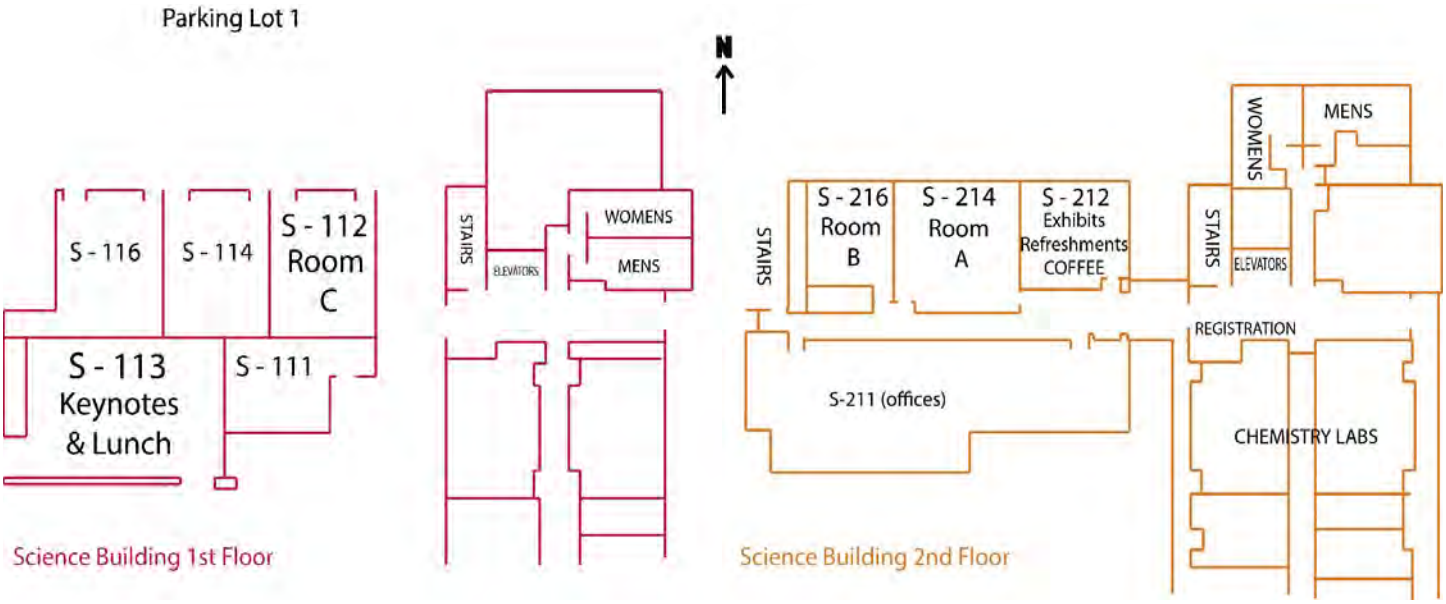


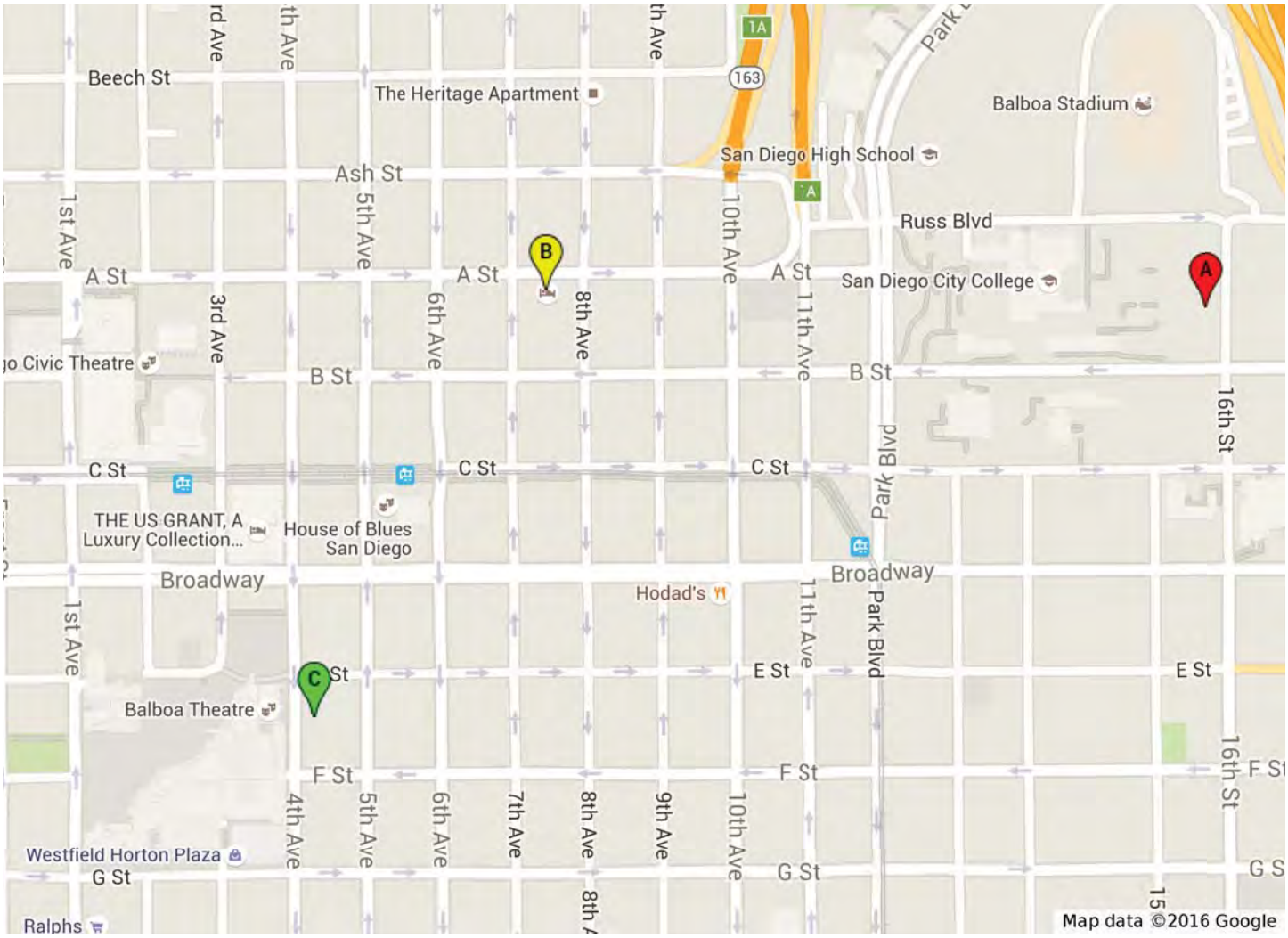
All events on campus will be held in the Science Building. Registration will be open on Friday and Saturday morning on the 2nd floor Foyer of the Science Building.

Parking Information

For Friday, March 11 and Saturday March 12, all 2YC$_3$ participants can park in either Staff Parking Lot 1 or Parking Structure 3 (First Floor Only) without a permit. Parking in any other location on campus requires a permit. In the event these two lots are full, paid parking is availabe using the parking ticket dispenser on the third floor of Parking Structure 3, for parking on Levels 2 or 3 of Parking Structure 3.

Event Maps





A - San Diego City College Science Building; B - Declan Suites; C - Bandar Restaurant (Banquet)

I–A. *When Will I Ever Use This Stuff? Chemistry's Intrinsic Link to Societal Issues*

Scott Donnelly, Arizona Western College

Both general and organic chemistry are enviable platforms to show the relevance and application of chemical principles as discussed in lecture and done in lab to a larger landscape such as their impact and influence on social issues and/or themes. Core topics covered in both general and organic chemistry are oftentimes the driving force in chemistry's impact on or influence of a social issue. For example, in this presentation the presenter will discuss the basis behind the World Anti-Doping Agency's (WADA) decision (August 2014) to place on its banned substance list the seemingly benign noble gases xenon and argon. In addition, the presenter will discuss why a colorant is added to the food given to farm-raised Atlantic salmon so as to produce the characteristic pink-colored flesh associated with wild salmon and expected by savvy consumers. Furthermore, if you can't grow it, then it must be mined. The presentation will discuss the impact of the non-uniform distribution and mining of rare earth metals (mainly the lanthanides) on human communication systems and the impact of phosphate rock mining on the global production of food. A number of examples related to the chemistry of food fraud also will be presented. These specific topics and others are purposely chosen to show the complementary relationship between chemical theory as discussed in lecture to the application of theory as found in the 'real' world.

I–B. *Periscoping Your Way Through General Chemisty*

Ashton Griffin, Wayne Community College

So what is Periscope and what does it allow me to do with my chemistry students? Periscope is a "live video streaming platform", which means I can transmit a live recording of my chemistry classes to my Periscope and Twitter followers. Students who are absent can also tune in live or watch a recording of that day"s class for up to 24 hours. The advantages are that the videos are current, and set up is quick and easy. In the end, this is another way to reach my students with technology.

With the addition of another app – katch.me – I am able to store these videos indefinitely. Then using a link with Google Classroom, I can make them available for my students to watch any time they desire. Other functions in Google Classroom allow me to easily share chemistry-appropriate YouTube videos and other chemistry materials from my Google Drive folders with my students. I can also give students links to interesting chemistry information that I might find on the internet and beyond, all in a paperless manner.

I–C. *Mixed-Methods Study of Online and Written Organic Chemistry Homework*

Philip Janowicz, McGraw-Hill Education

Connect for organic chemistry is an online learning tool that gives students the opportunity to learn about all aspects of organic chemistry through the ease of the digital world. This research project consisted of two fundamental questions. The first was to discover whether there was a difference in undergraduate organic chemistry content knowledge between students at a public institution who complete homework assignments online and those who complete homework assignments on paper. The second was to determine what kind of effect online homework had on student learning. Courses were designated at random to perform either online homework or traditional homework. At the end of the semester, students were asked to fill out a survey regarding their thoughts on the homework method used for their course. Students' exam grades were then analyzed. Students who utilized the Connect homework program did significantly better than those who completed traditional homework ($p < 0.006$, $n = 112$). The ACS average exam percentile score for sections using online homework was higher, 59.5, than those who used paper homework, 45.9. From the surveys, students mentioned that feedback and ease of use were the primary advantages to the online homework system.

II–A. *Chemical Weapons and How They Can Provide Examples When Teaching Various Topics in Beginning Chemistry Courses*

Mark Bishop, Monterey Peninsula College

Although I'm still teaching at Monterey Peninsula College, much to my surprise, I've also become the chemical weapons and explosives guy at the Middlebury Institute of International Studies at Monterey. Because I've started using chemical weapons as examples for various topics in my non-science majors course that I teach at the community college, I thought other community college instructors might be interested in what I'm doing. I have constructed my non-science majors class around various important issues. I teach just enough science for my students to understand these topics. For example, in order to explore the issues relating to climate change, my students learn about the different forms of energy, molecular structure, vibrations within molecules, excited and ground states, etc. Chemical weapons have been used since World War I, but there has be an increase in their use in the last couple of years by the Syrian government and most recently by the Islamic State. In my talk, I will briefly describe the most important chemical weapons, their physiological effects, and the history of their use. I will also show how they can be used to illustrate a variety of topics, including the symbolic ways we describe molecules (Lewis structures, ball-and-stick models, space-filling models, and line drawings), the description of the structure and function of hemoglobin molecules (and how hemoglobin and other protein molecules can be altered by phosgene), the structure of DNA (and how sulfur mustard changes it), enzymes (and how they are involved in the physiological effects of hydrogen cyanide and nerve agents), and hydrolysis reactions (important in the destruction of chemical weapons).

II–B. *Reflective Journals in Chemistry Classes*

Olga Katkova, Truckee Meadows Community College

Are you interested in unlocking the secrets of student participation in your classes? I have been using reflective journals in chemistry classes for the last four years and I could see that it made a huge difference on the level of the critical thinking of my students. The use of reflective journals is based on the concept that good learners tend to be reflective thinkers. The major goal is to provoke the students to think about what they are learning in the class. I would like my students to analyze the material that we cover for every chapter and be able to reflect on it. Plus, many of my colleagues found reflective journals as a great addition to their classes.

III–A. *Chemistry on the Small Screen: A Discussion of the Chemical Aspects of the Movies and TV*

Robert Killin, Arizona Western College

Chemistry is referred to as the "central science", meaning that it supports many of the topics covered in other disciplines. This applies to the real world as well. In particular, the entertainment world. The purpose of this presentation is to show representative examples of chemistry on the small screen, both movies and TV shows. In each clip, the chemistry demonstrated will be analyzed for both correctness and safety. It will be shown that, although in general filmmakers portray the chemistry correctly or close to correctly, there are safety aspects that need to be discussed and addressed.

III–B. *Tips & Tools for the Online/Hybrid Chemistry Classroom*

Kathy Carrigan, Portland Community College
Jon Gittins, Delta College

Building collaboration among Chemistry Faculty who teach online and hybrid courses is a priority of a workshop presented by Kathy Carrigan, Ken Friedrich, of Portland Community College in Oregon, Tom Higgins of Harold Washington College, Chicago, and Jon Gittins of Delta College in Michigan. The collaboration between us was developed in 2YC$_3$ meetings in past years and we want to include you in future collaboration.

Kathy and Jon will present a brief overview of the NSF sponsored cCWCS workshop on Teaching fully online and hybrid Chemistry courses, including tips of what works and what doesn't work in an online chemistry course. If you have been teaching a face to face class for years and now are being "encouraged" to use an online medium to present, we can help direct you to technologies available and suggest helpful strategies to engage students. We will invite attendees to join in on the conversation and sign up for the website that is currently under development. Come join us to begin or continue building cohorts in Online and Hybrid Chemistry Education.

IV–A. *Teaching Sustainability in the Chemistry Classroom*

Julie Ellefson and Joe Wachter, Harper College

It is impossible for societies to promote infinite growth on a finite planet. Instead, educators need to promote sustainable lifestyles by preparing students to be culturally competent global citizens and to offer students a more equitable educational experience. This session will focus on what faculty have done in ther chemistry classes to incorporate curricular units on water issues, climate change, energy production and alternative fuels, and the inequity that accompanies unsustainable living. An open discussion on developing socially and civically responsible students will be included.

IV–B. *Multimodal Approaches to Teaching Organic Chemistry*

Shadi Assaf, Olive Harvey College

Multimodality is multiple modes of communication used to exchange ideas, information, and make meaning among individuals in a given society and culture. A brief study in organic chemistry II involved delivering an organic chemical mechanism in multiple modes of communication (written text, static diagram, diagram and oral text). The students' understanding and meaning-making of the organic mechanism was probed via content-specific (mechanistic) and modes of communication specific questions. The study found that the students' preferred a multimodal approach to teaching and learning an organic chemical mechanism, but each mode enabled students to think differently in order to understand the mechanism. Come and learn about multimodality to possibly incorporate some of its components into your chemistry classes.

IV–C. *Who Says Not Everyone Can Go To College?*

Dave White and Shane Haggard, San Diego City College
Jolie Pickett, Camille Fowler, and Denise Perez, Garfield High School

In 1998, Garfield High school (GHS), a continuation high school with low-income, low-performing students, moved into a new building located on the campus of San Diego City College (City College). At that time the San Diego Unified School District and San Diego City College created a partnership that provided an opportunity for GHS students to cross enroll in a physical science lecture class and a physical science

laboratory course at City College. The success of this partnership is well documented. Over the past 18 years, more than 300 GHS students have successfully completed these courses. Recently, through the collaborative efforts of City College physical science faculty and GHS science teachers, this partnership was expanded to provide an opportunity for all GHS students enrolled in science at GHS to do chemistry and physics labs at City College.

FC–1. *Astrochemistry Tour of the Cosmos*

Lisa Will, San Diego City College and Reuben H. Fleet Science Center

Chemistry plays an important role in our study of the universe. You have likely heard about the spectra of stars, but have you heard about the possible salt flats on the asteroid Ceres or perchlorates on Mars? Join us to learn about some exciting astrochemistry topics you can use to capture students' attention and relate chemistry to current events in science.

V–A. *NSF Programs for Community Colleges*

Tom Higgins, National Science Foundation Division of Undergraduate Education

The National Science Foundation (NSF) has several funding programs that support community and technical colleges, and their students. This presentation will discuss the four major programs in the Division of Undergraduate Education (DUE) and NSF resources available through nsf.gov. It will be followed by a question and answer period.

The four DUE programs are Advanced Technological Education (ATE), a workforce program that helps students develop skills and earn credentials to get jobs in their communities; Improving Undergraduate STEM Education (IUSE), a transformative program that improves student learning and prepares the scientific leaders of tomorrow; Robert Noyce Teacher Scholarships (Noyce), a scholarship program for STEM majors who want to become K12 teachers; and Scholarships in STEM (S-STEM), a scholarship program for academically talented and financially needy students earning STEM degrees.

Potential audience members are encouraged to browse the homepage of the NSF Directorate of Education and Human Resources (EHR) for other programs of interest, especially in the NSF Division of Human Resource Development (HRD). If you are interested in other NSF programs, please email Dr. Higgins and he will try to incorporate the material into his presentation.

V–B. *A New California Chemistry Diagnostic Test*

Ram Subramaniam, De Anza College

A team of chemistry instructors from the University of California, the California State University, the California Community Colleges, and California High Schools has generated a new version of the California Chemistry Diagnostic Test. Multiple versions of this test have been used since 1997 in California and nationally to assess student preparation for college chemistry. Like the current versions of the tests, which are distributed by the Exams Institute of the ACS Division of Chemical Education, the new test consists of 44 multiple-choice questions that can be administered in an hour. The test addresses topics that are covered in a freshman chemistry curriculum, as well as laboratory skills and mathematical fluency. The test is being field-tested at various institutions across California this spring, and the final version is expected to be available in January, 2017. Faculty interested in supporting the CCC approval process for the test's use as a diagnostic tool at their institution should contact Jack Eichler (jack.eichler@ucr.edu), one of the co-chairs of the test development project.

V–C. *Teaching Organic Instrumentation Using Inquiry Learning*

Faith E. Jacobsen, Johnson County Community College

Organic chemistry students frequently can become confused or discouraged when learning to use spectra tables to determine the structure of an unknown compound. Using a guided inquiry approach, students construct their own spectroscopy tables to learn how to interpret IR and NMR spectra, which has equated with less student frustration and anxiety when it comes to spectra interpretation. Examples of infrared spectroscopy guided inquiry lessons will be emphasized.

VI–A. *A Model for Authentic Embedded Investigative Laboratory Curriculum at a Two-Year College*

Kalyn Shea Owens and Ann J. Murkowski, North Seattle College

North Seattle College (NSC) and Central Washington University (CWU) have collaborated to address the need to embed authentic, research-based experiences in the laboratory curriculum for general chemistry students, and for a year-long undergraduate research program. In this model, we bring a four-year university scientific research platform to a two-year college context through the iterative design of investigative laboratory curriculum that centers on some of the most pressing environmental challenges facing the world today. Essential design components are (i) hands-on exposure to sophisticated instrumentation in association with (ii) activities and experiences that establish a culture of thinking where student voices are encouraged, valued, and driven by engagement with relevant issues. These activities are developed specifically with the unique needs and culture of the community college student in mind. This presentation provides insight to the research platform model and the curriculum design process, along with pilot implementation and initial student learning results.

VI–B. *Using Machine-Learning Technology Tools to Map Test Items to a "Big Ideas" Framework*

Thomas Holme, Iowa State University
Kristen Murphy, University of Wisconsin-Milwaukee

The ACS Exams Institute has worked with chemistry educators for eight years to build a "big ideas" template for the content of the chemistry curriculum, called the Anchoring Concepts Content Map (ACCM). ACS Exams has mapped over 2000 general chemistry test items to this map to investigate how content coverage has changed nationally over the past 20 years. More recently, we have built an interface that allows instructors to input their own test items and then uses machine-learning information retrieval system called QMAP to help identify where in the ACCM these locally written test items align. Ways to use this technology to enhance conversations about content coverage between different campuses, or between 2-year and 4-year schools are being explored and ACS Exams is eager to work with faculty interested in helping identify ways to improve the technology and visualization tools to support this type of use of the QMAP system.

VI–C. *E-Texts in the 21st Century*

Ketan Trivedi, Virginia Tech Research Center

Computer programs have become a better alternative to the traditional Chemistry textbooks. The current student body is much more familiar and comfortable with the use of a keyboard, mouse and screen for learning and communication. Interactive participation between a program and a student, with the program understanding the students input, and producing a response that helps the student learn is currently possible.

VI–C. *E-Texts in the 21st Century*

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WK-A. *Get a Jump Start Using the ACS Assessment Tool for Chemistry in Two-Year College Programs: A Resources for Excellence Workshop*

Olga Katkova, Truckee Meadows Community College
Amy Jo Sanders, Stark State College

You are invited to stay connected and develop solutions for excellence at the upcoming workshop, "Get a Jump Start Using the ACS Assessment Tool for Chemistry in Two-Year College Programs." Two-year programs are under increasing pressure to perform self-assessments and document their outcomes. The ACS Assessment Tool for Chemistry in Two-Year College Programs is a resource to help your institution identify strengths and opportunities for growth in the context of the ACS Guidelines for Chemistry in Two-Year College Programs.

During this workshop, the assessment tool will be presented along with data as to how institutions use the assessment tool. Additional ideas on how to use the assessment tool will be discussed, and participants will have a chance to start working on a section of the assessment tool. Participants will leave with an action plan to complete part or all of the assessment tool. Our goal is to decrease the activation barrier for using the assessment tool.

WK-B. *Addressing Student Misconceptions with Molecular-Level Visualization and Simulation*

Jurgen Schnitker, Wavefunction, Inc.

Relating the macroscopic and symbolic levels of chemistry to molecular phenomena is notoriously difficult for students. The problem can be addressed head-on with three-dimensional visualization at the molecular level—abstract concepts come to life and students are left with a realistic and intuitive feel for the molecular world. Attendees of this workshop will learn how to use ODYSSEY Molecular Explorer to set up demonstrations and student labs. Active participation on laptops (Windows or OS X; we will install the program just before the workshop) is strongly encouraged. About a dozen laptops will be available for instructors who are unable to bring their own computers.

VII–A. *Lessons from Cognitive Science and Your Introductory Chemistry Classroom*

Laura Frost, Florida Gulf Coast University

Did you know that most students study for an exam by re-reading their textbook and notes? Did you also know that this has been shown to be an ineffective study method for most of them? We can apply the work of our cognitive science colleagues to our own chemistry classrooms to effectively enhance instruction. We will examine how the brain processes information and discuss how this evidence can be used in our introductory chemistry classrooms. We will consider some simple adjustments that can better build understanding in our students.

VII–B. *Undergraduate Research at a Community College*

David Hecht, Southwestern College

Please join us for an informal discussion, sharing experiences as well as some of the challenges and opportunities with undergraduate research at a community college. Take this as an opportunity to compare notes and to network. For those who are not currently involved with undergraduate research, come and learn more!

VII–C. *Chemistry Connections for Community College Students (4 C's) at UC San Diego: An NSF-REU Program*

Haim Weizman and Stacey Brydges, University of California, San Diego

Our NSF-funded Research Experiences for Undergraduates (REU) program is unique in that it offers first-year (or the equivalent) students attending the broad network of two-year colleges within commuting distance of UC San Diego an intensive and integrated early undergraduate research experience in the chemical sciences. This first opportunity to participate in scientific discovery and knowledge generation is intended to sustain student's interest in science, to help them develop new skills, understandings, and self-awareness, and ultimately, to enable their successful transition to a four-year university and eventually a science-related career. The program spans a year, starting with an orientation to research in the late Spring. During the summer participants are fully immersed in a research project over ten weeks and participate in a variety of community building as well as academic enrichment activities. Research, training, and mentoring extends into the next three academic quarters, allowing REU Fellows to build on their summer apprenticeship. In this presentation we will describe the specific program design, early experience in implementation, and short-term outcomes, as captured by the Survey of Undergraduate Research Experiences (SURE) and feedback from faculty and graduate student mentors.

VIII-A. *Using Case Studies from Current Events in General Chemistry Laboratories to Engage Students with their Environment*

Tracy J. Terry, University of New Mexico – Valencia

Several case studies have been developed to engage students with their environment while meeting learning objectives for general chemistry laboratories. Three case studies will be presented here which cover the environmental topics of ocean acidification, the Deepwater Horizon oil spill, and the Air Force jet fuel spill in our local aquifer. These case studies effectively address course learning objectives such as acid/base equilibria, the Le Chatelier Principle, concentration unit conversions, intermolecular forces, and solubility while actively engaging students in both global and local environmental concerns. Students consistently rank these case studies as the most enjoyable and influential activities in the general chemistry laboratory.

VIII-B. *Textbooks in Transition: It's All About Options*

Mark Bishop, Monterey Peninsula College

I have a 15-year-old daughter, so I get a glimpse at how modern students use textbooks. She has physical books for some of her classes and electronic books for others, and she's often frustrated by the limitations of the physical books. She likes being able to do a text search of her electronic books to find information, and she really likes the hyperlinks in her electronic textbooks that take her to animations, tutorials, and other tools that supplement her learning. In my talk, I will describe the various forms of my textbook (An Introduction to Chemistry)…as a traditional printed text, in PDF form on the Net (http://preparatorychemistry.com/), as part of an electronic text/tools/homework package created with WebAssign (http://www.webassign.net/bishop), as a series of audio presentations, and as an eBook in the format used on iPads and other tablet devices. I will also describe the tools that can be used to create learning materials in any of these forms. I'll show how students using a less-expensive electronic textbook can do all of the things they might do with a printed text, such as highlighting and leaving notes in the margin, and how they can do many things with an eText that are not possible with the traditional book.

VIII-C. *A Collaborative Approach to Incorporating Undergraduate Research and MALDI-TOF Mass Spectrometry Into a Two-Year College*

Andrew Aspaas, Anoka-Ramsey Community College

We have developed a partnership between a two-year college, a four-year university, a major researching university, and a local biofuels manufacturer to infuse research-like activities into the organic chemistry curriculum. This involved creation of POGIL-based curriculum materials, instructional videos, and field trips to local universities and businesses. The materials and methods are freely available for your use as a painless way of introducing undergraduate research and advanced instrumentation into your curriculum.

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2016 2YC$_3$ Officers

Abbreviated as COCTYC, the Committee on Chemistry in the Two-Year Colleges is designated as the executive committee governing the Two-Year College Chemistry Consortium and is charged with responsibility for three to four 2YC$_3$ conferences per year and its own finances and newsletter.

Officers names in MAGENTA are in attendance at the 213th conference

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Future Officer
YOU
Ask not what 2YC$_3$ can do for you... ask what you can do for 2YC$_3$!

Future 2YC$_3$ Conferences

Be sure to come and join us and/or present at our upcoming conferences! Up-to-date listings and information available at http://www.2yc3.org under Meetings.

Interested in hosting a conference? Contact Scott Donnelly at futuresites@2yc3.org

July 31 - Aug 4, 2016 - 214th Conference at
Biennial Conference on Chemical Education
University of Northern Colorado
Greely, Colorado
http://www.unco.edu/bcce2016/
Program Chairs: Scott Donnelly and Tamika Duplessis
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Fall 2016 - 215th Conference (Tentative)
Yavapai College
Prescott, AZ

March 31 - April 1, 2017 - 216th Conference
Truckee Meadows Community College
Reno, NV
Program Chair: Olga Katkova okatkova@tmcc.edu
Exhibits Chair: Matthew Leathen mleathen@tmcc.edu

Summer 2017
217th Conference
To Be Determined

Fall 2017 - 218th Conference
Durham Technical Community College
Durham, NC

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213TH 2YC3 Program Addendum

The following additions and/or changes have been made to the program since publication.

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PROGRAM ADDITION:

Friday Afternoon, March 11

1:30 – 2:05 PM – Parallel Presentation Session III–C

The Benefits of Undergraduate Research as a Teaching Tool from a Students' Perspective

Vicki Flaris and Raul Rivas, Bronx Community College
Robert Josman and Henry Siccardi, City University of New York
Charles Seaks, Fordham University
Science Building, Room S-112

Abstract: This paper is a students' perspective analyzing the benefits and challenges of utilizing research to enhance chemistry curriculums at two-year institutions. Since many two-year college students are considered "non-traditional" there should be particular emphasis placed on academic supplements that can be accomplished independently. Furthermore, many students at two-year institutions represent underserved minority and socioeconomically disadvantaged populations who serve to benefit greatly from such work. Research projects provide students with opportunities to grow and develop academically in ways that a curriculum alone cannot provide. Research serves not only to reinforce the curriculum and help the student grasp material, it also increases their retention in the STEM programs, and further motivates them to pursue careers in the sciences. Their growth in turn benefits not only their academic practice but that of the institution as a whole. Furthermore, they develop skills and experiences that better prepare them for higher education, continued research, and jobs in industry. This work will also explore the unique challenges faced by two-year college students involved in research and possibilities for overcoming them.

PROGRAM ROOM CHANGES:

Page 8, Parallel Presentation VI–C "*E-Texts in the 21st Century*" will be held in room S-112, not S-212.

Page 9, Workshop Session WK–B "*Addressing Student Misconceptions with Molecular Level Visualization and Simulation*" has been moved to room S-114.

EXHIBITOR ADDITION:

http://www.cengage.com/us/

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213TH 2YC3 Program Addendum – Saturday, March 12, 2016

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PROGRAM ADDITION:

Saturday Morning, March 12

10:15 – 10:50 AM – Facilities Demonstration

Tour of the Facilities

Nancy Crispen & Shane Haggard, San Diego City College

Science Building, Room S-214

Due to the high demand for both the Astrochemistry tour and the tour of the facilities, this has been added during the morning refreshment break.

PROGRAM ROOM CHANGES:

Page 8, Parallel Presentation VI–C "*E-Texts in the 21st Century*" will be held in room S-112, not S-212.

Page 9, Workshop Session WK–B "*Addressing Student Misconceptions with Molecular Level Visualization and Simulation*" has been moved to room S-114.

EXHIBITOR ADDITION:

http://www.cengage.com/us/