



# Chemistry Outlook

An Activity of  
The Committee on Chemistry in the Two  
Year Colleges;  
Division of Chemical Education;  
American Chemical Society

Main Website:

<http://www.2yc3.org>

Issue:

Issue I, 2016

Blog:

<http://2yc3outlook.org>

Twitter:

@2YC3

Facebook:

2YC3

213<sup>th</sup> 2YC<sub>3</sub> Conference: San Diego City College  
March 11-12, 2016



If you're looking to network with fellow two year college chemistry faculty in a warm and sunny location, then please consider joining us March 11-12, 2016 for the 213<sup>th</sup> 2YC<sub>3</sub> Conference, which will be held in San Diego, California at San Diego City College. The theme for this conference is "**Teaching Chemistry through its Social Impacts**".

If you're considering giving a presentation or holding a workshop at the 213th Conference, abstracts are due by **February 15** to Nancy Crispen ([ncrispen@sdccd.edu](mailto:ncrispen@sdccd.edu)).

Registration is now open at <http://www.2yc3.org>. Early registration (at a lower cost) is available until **February 25**, though you can still register up until the day of the conference.

More information about the conference can be found on page 3 of the newsletter.

## In this issue:

pg 2

Info:  
2016 BCCE

Helium  
4.00

pg 3

More Info:  
213th  
Conference

Lithium  
6.94

pg 4

Notes from  
the Chair

Beryllium  
9.01

pg 5

Dalton's  
Dilemma

Boron  
10.81

Where will your most promising 2YC biochemistry students complete their bachelor's degrees?

Consider Connecticut College's Science Leaders program for 2YC biochemistry transfer students.

This new program offers:

- A focus on 2YC transfers in biochemistry
- A close-knit cohort of students
- Opportunities to engage in research with faculty
- A College-funded summer internship
- A selective, residential, small liberal arts experience
- Financial aid that meets 100% of demonstrated need

Students interested in transferring need at least a B+ in biology (1 year), general chemistry (1 year), organic chemistry (1 year), calculus (1 year) and physics courses (1 year).

For more information please send your students to  
[www.conncoll.edu/biochem-science-leaders/](http://www.conncoll.edu/biochem-science-leaders/)

CONNECTICUT COLLEGE

2016 Biennial Conference on Chemical Education  
University of Northern Colorado, Greeley CO  
July 31-August 4, 2016



The 2016 BCCE (Biennial Conference on Chemical Education) will be held from July 31 to August 4 at the University of Northern Colorado in Greeley. If you're interested in submitting an abstract for a symposium at the conference, the deadline for submissions is **February 28**. Two community college-related symposium we encourage you to present at are: "Consider presenting symposium Collaborations: The Bonds That Strengthen Two-Year College Chemistry Faculty in Today's Learning Environments" and "The First Two Years and the 2015 ACS Guidelines". Registration for the conference opens on March 6, with early registration ending **June 2**. Information about workshops, symposia, lodging, and more can be found at <http://www.unco.edu/bcce2016/index.html>.

380 to 950 nm  
in under one second

The SpectroVis® Plus Spectrophotometer



Collect a full spectrum (absorbance, percent transmittance, or intensity) with a USB-powered, CCD array spectrometer.

[www.vernier.com/svis-pl](http://www.vernier.com/svis-pl)



# More Info: 213<sup>th</sup> 2YC<sub>3</sub> Conference: San Diego City College March 11-12, 2016

## **Keynote Addresses Include:**

Dr. Kimberly Prather; University of California, San Diego and Scripps Institution of Oceanography, "How Aerosols Impact our Climate"

Dr. David Brown; Southwestern College, "Diversifying the STEM professional workforce"

Dr. Matt Anderson; San Diego State University, "Making Videos with Learning Glass"

**Friday banquet info:** On Friday, March 11 at 6:00 pm, this conference will feature an informal banquet at Bandar Restaurant in the historic Gaslamp Quarter, walking distance from the Declan Suites Hotel (0.5 mi) and a very short Uber from San Diego City College (1.0 mi). Please note that the banquet will only hold 55 persons, and any banquet payments made after this limit is reached will be refunded. The cost is \$45 per person, includes a hummus appetizer, salad, and a plated entrée choice among Chicken, Beef Koobideh (ground filet), or Eggplant Vegetarian Stew. A bar is available, tableside service only, and cash/carry.

## **Information about Airports, Transportation, and Lodging**

*San Diego International Airport (Airport Code: SAN)* is served by every major airline and is only 4 miles from San Diego City College. The college can be reached by bus, taxi, Uber, or rental car. Parking downtown will incur a fee. Although parking will be available at the college, overnight parking on campus is not permitted.

The Declan Suites (701 A Street, San Diego, CA 92101) is a pet-friendly hotel located in Downtown San Diego, four blocks from San Diego City College, three blocks from the Gaslamp District, 3.3 miles from the San Diego International Airport (about an \$18 cab, \$12 uber), 1.8 miles from the World Famous San Diego Zoo, and on the trolley line, San Diego's municipal train system. For those attending the ACS conference starting on March 13th, the San Diego Convention Center is 1.0 miles from the Declan Suites. (\$139 + tax per night (one or two beds); Note that this is a Downtown property and parking is \$18.00 per night. Rate is available from 3/10 – 3/13 and also on shoulder on a space available basis. Call (619) 819-6610 for reservations, ask for Erica; Use Group Code: SDCCCO; San Diego City College (Reservation Deadline: February 11, 2016))

**Conference Website:** <https://www.sdcity.edu/2yc3>

## **Contact Information:**

### **Program Co-Chairs:**

Nancy Crispel (San Diego City College)	ncrispen@sdccd.edu	(619) 388-3612
Joann Um (Southwestern College)	jum@swccd.edu	
Haim Weizman (University of California, San Diego)	hweizman@ucsd.edu	

### **Local Arrangements Chair:**

Robert Kojima (San Diego City College)	rkojima@sdccd.edu	(619) 388-4419
--	-------------------	----------------

### **Exhibits Chair:**

Shane Haggard (San Diego City College)	mhaggard@sdccd.edu
--	--------------------

102 <b>No</b> Nobelium [259]	52 <b>Te</b> Tellurium 127.6	16 <b>S</b> Sulfur 32.065	87 <b>Fr</b> Francium [223]	8 <b>O</b> Oxygen 15.9994	25 <b>Mn</b> Manganese 54.938045	90 <b>Th</b> Thorium 232.03806	63 <b>Eu</b> Europium 151.964	6 <b>C</b> Carbon 12.0107	1 <b>H</b> Hydrogen 1.00794	79 <b>Au</b> Gold 196.966569	77 <b>Ir</b> Iridium 192.217
---------------------------------------	---------------------------------------	------------------------------------	--------------------------------------	------------------------------------	---	---	--	------------------------------------	--------------------------------------	---------------------------------------	---------------------------------------

## Tamika Duplessis, Delgado Community College, New Orleans, LA



As my opening letter from the Chair, I would like to begin by first thanking you for your membership and making this organization what it is today. The Two-Year College Chemistry Consortium, 2YC<sub>3</sub>, is an organization whose goal is to aid its membership in professional development endeavors to enhance student learning. Serving the membership of this organization is not only my passion and purpose, but also that of the COCTYC (Committee on Chemistry in the Two-Year Colleges), the executive board governing 2YC<sub>3</sub>. I would also like to extend my gratitude to the members of the COCTYC who work tirelessly fulfilling the 2YC<sub>3</sub> mission to promote quality professional development programming as well as maintaining meaningful dialogue with academic and related chemistry professionals to promote standards of excellence in our chosen profession. And, to our immediate past chair, Scott Donnelly for his leadership and dedication, Go raibh maith agat, Thank you in Gaelic Irish!!

In this past year, serving as Chair-elect, working with members of 2YC<sub>3</sub> and my subsequent activities with ACS, I have come to realize how truly special this organization really is. 2YC<sub>3</sub> is uniquely positioned between chemistry instruction at all levels, the community and industry. It links a nationwide network of chemistry and chemical-based technology faculty members and provides timely information regarding trends and advances in chemistry education instruction, standards, research and technology. 2YC<sub>3</sub> provides a platform for open dialogues to discuss all facets of chemistry education with a specific focus on the 2-year college community.

In November, I had the pleasure of attending the 212<sup>th</sup> 2YC<sub>3</sub> Conference at Piedmont Virginia Community College in Charlottesville, VA. Barbara Heyl and Frances Rees were amazing conference co-chairs and hosts. This conference was the late fall conference in our 2015 cycle of conferences. The trip to Charlottesville, was picturesque to say the least. I flew in to Washington, DC. and drove down to Charlottesville on a very winding road (via I-66W and US-29 S) and saw firsthand the many colors of autumn. Autumn is by far my favorite season with its stunning display of browns, golds, oranges and reds. Being from New Orleans, I usually experience two real seasons, summer and not-so-summer-ish. Witnessing the colors of the leaves that had transitioned from their summer vibrant hues of green to their vivid fall pallets made me reflect on the 2YC<sub>3</sub> changes of guard that I was going to be a part of.

Most color “changes” in leaves that are characteristic of autumn do not actually represent a change at all. Carotenoids, the natural pigments which produce the yellow, brown, and orange hues in plants, are always present. These pigments are usually masked during the photosynthetic growing period by the stronger pigment of green chlorophyll. The exception, however, is the production of the red-colored anthocyanin pigments that occur during the autumn season itself to yield the rich shades of red and purple in leaves.

Color changes in chemistry can be seen in an entirely different context. Changes in color are often a signal that a chemical reaction took place. From the fundamental color change of litmus to red or blue to the redox color changes that occur in the oscillating clock reactions, color change is the “magic” that captivates audiences. I like to think of students as blank canvases at the beginning of the semester -some, of course, with preconceived notions of the rigors of the science of chemistry. Nevertheless, they are blank canvases waiting to be colored with the magic of the amazing science that is chemistry.

*Continued on page 5*

To close, as we embark on a new year and a new semester, I challenge you to be creative and try at least one new instructional device, activity or classroom demonstration. Put the magic back into instruction. Recall what first drew you to study chemistry and be that spark for someone else.

I hope to meet you at our next meeting, which will take place March 11-12 at San Diego City College. The conference's theme of "Teaching Chemistry Through Its Social Impacts" is poised to be extremely interesting and timely. For more information on the meeting including program information and registration, please visit the conference website at <http://www.sdcity.edu/2yc3>.

United through the bonds of chemistry,

Tamika Duplessis

## Dalton's Dilemma

A science skit by Shree Iyengar, PhD, Anne Arundel Community College, Arnold, MD

This skit is a fun way to introduce the concept of diatomic elements in an introductory/general chemistry class. It takes about fifteen minutes. It needs three people to enact a scene depicting the controversy about diatomic elements in the 1800s. The instructor can assume the role of Stanislao Cannizzaro (who introduces the theme) to make the skit effective. Two students can be recruited to read the parts of John Dalton and Amedeo Avogadro. There is no need for anyone to memorize the script. The skit can be done as a staged reading, but it is good to practice the lines before presenting. Preferably, Dalton should have a British accent and Avogadro should try the Italian accent. I have had groups of students do the skit in my first semester general chemistry class a few times and students always have fun watching the skit and learning about diatomic molecules. Hope you will consider using the skit as a tool to make chemistry fun in your class.

### The Setting

It was September 3, 1860 in Karlsruhe, Germany. The event: International Scientific Conference. In attendance were a number of prominent scientists of the time including Dmitri Mendeleev of Russia, Lothar Meyer of Germany, Robert Bunsen (Bunsen burner inventor), and Emil Erlenmeyer (the developer of the omnipresent flask). The conference turned out to be a history maker in the sense that it paved the way for clearing a number of the most confusing ideas of the time on atoms, molecules, formulas of elements and compounds and eventually led to the formulation of the first correct periodic tables by Mendeleev and Meyer, independently, some ten years later. The person who set the course of action was an Italian scientist named Stanislao Cannizzaro. The skit starts with a short address by Cannizzaro at the conference. An imagined conversation between John Dalton (1766-1844) of England and Amedeo Avogadro (1776 – 1856) of Italy is presented to the audience to highlight the controversy of scientific ideas in the early 1800s. The skit ends with some final remarks by Cannizzaro.

### Dalton's Dilemma

**Cannizzaro:** Distinguished gentlemen...and lady scientists, if there are any, please forgive me. I am happy to see you are all here. I welcome Mendeleev of Russia, Meyer of Germany, Bunsen and Erlenmeyer. I thank the organizers of this wonderful and important conference. I intend to present a paper based on the important conclusions arrived at by my countryman, Amedeo Avogadro. He published his work in 1808. But, his work was rejected by his contemporary John Dalton of England. Neither Avogadro nor Dalton is here today among us...bless their hearts.

I will take you back about 50 years when the controversy was at the peak... In reality they never met in person...but, I want to stretch it a little so you can see how science got messed up then...here come Avogadro and Dalton...

(*Dalton enters the scene, holding a piece of paper in his hand.*)

**Dalton:** This is utter nonsense. No scientist in his sound mind would even propose this idea. I will not yield to this assault on science and my reputation in the scientific community.

(*Dalton slams the paper on the table; paces back and forth, shaking his head and then continues his monologue.*) What...? He is saying equal volumes of gases at the same temperature and pressure contain equal number of

*Continued on page 6*

particles...he calls them molecules and says a molecule is a combination of two or more atoms. But, the particles can't be more than one atom. Let me show you...

(*Dalton writes on the board or paper to show the audience*)

Oxygen is simply O and hydrogen is simply H. So, water has to be HO. Nitrogen is N and hydrogen is H. So ammonia has to be HN.

(*Avogadro enters the scene, holding a notebook with his findings. He waves the notebook toward Dalton.*)

**Avogadro:** Hello Professor Dalton...I do have the strongest evidence to show that some gas particles exist as molecules and not as atoms, contrary to you what you say. I ask you to believe me.

**Dalton:** (*Laughs sarcastically*) Believe you? Why? Your paper of 1808 was written poorly. You used ambiguous terminology and your math is too complex. Nothing makes any sense to anybody. It's like Italian spaghetti – all over the place...!

**Avogadro:** No, no. The terminology is not ambiguous, but it is new. Sorry, if you don't understand the new language. If you take the time to read it, you will see my point. I based my conclusions on the French scientist's observations.

**Dalton:** Oh!? You mean Gay-Lussac's observations on volumes of combining gases...? Yes...yes, I have read his work carefully as well.

**Avogadro:** Yes, yes, him! He did very well indeed.

**Dalton:** You know about the French – they are nuts. They start wars they can't finish...I don't agree with you or him.

**Avogadro:** The volume of gases that combine seems to be whole number ratios; two volumes of hydrogen combine with one volume of oxygen to make two volumes of water vapor. Three volumes of hydrogen combine with one volume of nitrogen to make two volumes of ammonia.

**Dalton:** I thought so in the beginning when I read his work. But if I agree to his findings, my popular thoughts on atomic nature of matter would...

**Avogadro:** Would still be upheld, professor! We are not contradicting what you are saying about atoms as particles...just that in some cases, these atoms can be in combined state – molecules of elements like  $O_2$  for oxygen,  $N_2$  for nitrogen and  $H_2$  for hydrogen.

**Dalton:** I disagree and strongly so! Even the Swedish chemist Jon Jacob Berzelius agrees with me. You do have some respect for great scientists like Berzelius...and me, don't you?

**Avogadro:** Dear professor...this is not about my respect for Berzelius or a great scientist like you. It is about good science and what my experimental results tell me...clearly!

**Dalton:** Clearly, you have gone mad! I measured the densities of water, ammonia and carbon dioxide and other gases. These compounds have lower density than the elements that combine to make them. And, my formulas for water, ammonia and other substances would have to be revised. The atomic masses of elements will not be what I published before.

**Avogadro:** I computed the atomic mass of Oxygen to be 15; you're saying it is 7.5. My calculation for nitrogen is 14, you are saying it is 7. If you accept these gases are diatomic molecules, the confusion will disappear.

**Dalton:** Are you saying water is  $H_2O$  and ammonia is  $NH_3$ ? This is totally preposterous. I insist my formulas are correct: water is HO, and ammonia is NH!

**Avogadro:** So, you will not change your mind about the idea of molecules...?

**Dalton:** You have no experimental evidence to prove this. Now, if you would excuse me, Avogadro...I have to get back to my work on partial pressures of gases in mixtures.

**Avogadro:** Are any of those molecules, professor?

(*Dalton, apparently upset, points Avogadro out of the room. Avogadro leaves shaking his head.*)

(*Cannizzaro is back on the Karlsruhe conference scene. He chuckles a little, looking at the audience.*)

**Cannizzaro:** I am not sure the conversation between Dalton and Avogadro would have been as cordial as you just saw. I thought I would be polite in my representation.

You have witnessed what the controversy is all about. Simply put, the big question is: do some elements exist as molecules? Please take this paper home, read it very carefully, ponder and then decide for yourself if some elements exist as molecules. I guarantee that once you accept this important idea, your views on chemical theories, including Dalton's ideas on atomic weights and formulas of certain compounds and elements, will change and chemistry will be easier to practice in the years to come. Good day, gentlemen... Ciao.

**The End**

## The Ultimate UV-Vis for a Teaching Setting

Shimadzu's versatile, user-friendly **UV-1280 spectrophotometer** is ideally suited for the teaching lab, offering intuitive operation while providing comprehensive measurement options in a compact body.



### Key features/benefits of the UV-1280 include:

- Multi-function capability with seven measurement modes, including bio
- Wavelength scanning from 190 to 1,100 nm
- USB memory ready, making it easy to transport analysis data and to store large amounts of data in a PC
- Easy-to-see LCD enables intuitive measurement, instrument validation, and printing operations

Learn more.

Call (800) 477-1227 or visit

**[www.ssi.shimadzu.com/UV](http://www.ssi.shimadzu.com/UV)**

Shimadzu Scientific Instruments, 7102 Riverwood Dr.,  
Columbia, MD 21046, (800) 477-1227

## Of Note:

- Check out the new 2YC<sub>3</sub> Outlook Blog at the address <http://www.2yc3outlook.org>. New posts with information about conferences will appear regularly!
- If you'd like to submit an article to the Outlook newsletter, send it to [newsletter@2yc3.org](mailto:newsletter@2yc3.org). The deadline for the Volume II of the newsletter will be May 1, 2016.
- You can now pay for your membership on the 2YC<sub>3</sub> website (<http://www.2yc3.org>). Click on "Membership Form" on the left side of the main page to become a member or to renew your current membership.

## COCTYC and Support Staff 2016 Roster of Committee Members

<b>Chair</b> Tamika Duplessis, Delgado Community College (LA) <a href="mailto:chair@2yc3.org">chair@2yc3.org</a>	<b>Chair-Elect 2016</b> Kathy Carrigan, Portland Community College (OR) <a href="mailto:chairelect2016@2yc3.org">chairelect2016@2yc3.org</a>	<b>Chair-Elect 2017</b> To Be Announced!
<b>Immediate Past Chair (Future Sites Coordinator)</b> Scott Donnelly, Arizona Western College (AZ) <a href="mailto:futuresites@2yc3.org">futuresites@2yc3.org</a>	<b>Past Chair (DivCHED Representative)</b> Neil Bastian, Salt Lake Community College (UT) <a href="mailto:pastchair1@2yc3.org">pastchair1@2yc3.org</a>	<b>Past Chair (TAB Coordinator)</b> Pam Clevenger, Itawamba Community College (MS) <a href="mailto:tabchair@2yc3.org">tabchair@2yc3.org</a>
<b>Treasurer</b> Julie Ellefson-Kuehn, Harper College (IL) <a href="mailto:treasurer@2yc3.org">treasurer@2yc3.org</a>	<b>Membership &amp; College Sponsors Chair</b> Jason Jadin, Rochester Community and Technical College (MN) <a href="mailto:membership@2yc3.org">membership@2yc3.org</a>	<b>Industrial Sponsors Chair</b> Michele Turner, University of Akron – Wayne College (OH) <a href="mailto:industrialsponsors@2yc3.org">industrialsponsors@2yc3.org</a>
<b>Newsletter Editor</b> Jon Gittins, Delta College (MI) <a href="mailto:newsletter@2yc3.org">newsletter@2yc3.org</a>	<b>Webmaster</b> Luca Preziati, Stark State College (OH) <a href="mailto:webmaster@2yc3.org">webmaster@2yc3.org</a>	<b>Workshops Liaison</b> Amy Jo Sanders, Stark State College (OH) <a href="mailto:workshops@2yc3.org">workshops@2yc3.org</a>

Vincennes University  
Committee on Chemistry in the Two Year College  
1002 North First Street  
Vincennes, Indiana 47591-5201

Nonprofit Org.  
Auto  
U.S. Postage  
PAID  
Permit #85  
Vincennes, IN 47591

Tamika Duplessis, CHAIR  
Jon Gittins, EDITOR  
COMMITTEE ON CHEMISTRY  
IN THE TWO-YEAR COLLEGE  
Division of Chemical Education  
American Chemical Society



Introductory  
Price

\$749.00 per unit

COMPUTER-BASED  
**DATA ACQUISITION**  
**TOOLS** and SOFTWARE for  
**CHEMISTRY**

**Streamline Your Teaching Labs.**

The new MicroLAB 528 replaces multiple stand-alone lab instruments

**Basic Measurements**

- pH / Redox / DO
- Thermocouple
- Electrochemistry
- Gas Pressure
- Time
- pH/Indicator Titrations
- Temperature
- Counts/drops
- Volts/ Millivolts
- Conductance
- Light
- Milliamperes

**FASTspec™ Scanning Spectrophotometer**

- 360-880 nm
- Fluorescence
- Kinetics
- Transmission
- Color Comparison
- Spectral Profiles
- Absorbance
- Turbidity
- Spectrophotometric Titrations
- Scatter
- Beer's Law
- Backscatter Turbidity

**High Resolution Measurements,  
Small Safe Samples, and Easy-to-use Software**

**NEW 5<sup>th</sup> GENERATION FEATURES!**

- Constant Temperature Heater System
- Sample Illumination
- Rotating Field Magnetic Stirring
- Real-time Tactile Control
- Regulated Electroplating/Coulometry Power Supply