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Symposia Organizers and Topics

1. **Bringing Research to the Undergraduate Course Curriculum, Stefan Lutz,** *(Co-sponsored with WCC)* Department of Chemistry, Emory University, Atlanta, GA 30322, tel: (404) 712-2170, fax: (404) 727-6586, sal2@emory.edu

   Research-based laboratory courses offer new opportunities but also present new challenges to engage and prepare undergraduates for a career in the chemical sciences. The symposium will focus on the pedagogical and logistical aspects of developing and teaching such courses, providing a platform for educators to present and discuss their current and future course ideas.

2. **Chemical Evolution I: Chemical Change Across Space and Time,** *(Co-sponsored with GEOC, DNCT)* **Lori Zaikowski**, Department of Chemistry, Dowling College, Oakdale, NY 11769, tel: (631) 244-3180, fax: (631) 244-1033, zaikowsL@dowling.edu, **Jon M. Friedrich**, Department of Chemistry, Fordham University, Bronx, NY 10458, tel: (718) 817-4446, fax: (718) 817-4432, friedrich@fordham.edu

   This symposium follows chemical evolution from the big bang to the origins of life on Earth. Multidisciplinary use of chemical principles and techniques is central to understanding the evolution of the universe. Presentations by leaders in their fields will provide a framework for a session on teaching the evolutionary nature of chemistry. The Teaching Evolutionary Chemistry session will focus on the implementation of symposium themes in classrooms and labs.

3. **Nanotechnology in Undergraduate Education, Kimberly Pacheco**, Department of Chemistry, University of Northern Colorado, Greeley, CO, 80639, tel: (970) 351-2148. Kimberly.Pacheco@unco.edu , **Richard Schwenz**, Department of Chemistry, University of Northern Colorado, Greeley, CO, 80639, tel: (970) 351-1287. Richard.Schwenz@unco.edu

   Incorporating nanotechnology early into the undergraduate curriculum enables students to begin thinking and visualizing at the molecular and atomic levels in their freshman and sophomore years. NSF-sponsored programs have successfully highlighted nanotechnology as an ongoing area of interest

that undergraduates can readily grasp and incorporate into their general understanding of the sciences. Hands-on laboratory experiences enhance and promote retention of nanoscience concepts.

4. **Advances in Teaching Chemistry at the Nanoscale at the K-12 Level, George Bodner**, Department of Chemistry, Purdue University, West Lafayette, IN 47907, tel: (765) 494-5313, fax: : (765) 494-0239,. gmbodner@purdue.edu

   The NSF-sponsored National Center for Teaching and Learning in Nanoscale Science and Engineering is involved in many aspects of bringing advances in teaching chemistry at the nanoscale into reality. This symposium will focus on: (1) professional development for K-12 teachers, (2) instructional materials being developed for introducing middle-school and high-school students to chemistry at the nanoscale, and (4) research on the teaching and learning of chemistry at the nanoscale in middle-school and high-school classrooms.

5. **Undergraduate Research Posters (Monday), Andrea Bennett**, Student Affiliates Program, American Chemical Society, 1155 Sixteenth Street, NW, Washington, DC 210036, tel: (202) 872-6166, a_bennett@acs.org

6. **Community College Led Advances in Undergraduate Education**, (*Co-Sponsored by YCC, CMA and WCC*) **Tom Higgins**, Department of Chemistry, Harold Washington College, tel: (312) 553-5791 tbhiggins@ccc.edu

   Community colleges provide a substantial fraction of foundational math and science instruction in higher education, and are a rich source of innovation. In addition, the naturally diverse community college student population requires instructional techniques that engage students of many backgrounds. This session will highlight some of the contributions community college faculty are making to undergraduate research and the scholarship of teaching and learning, followed by a discussion of how the presenters have successfully found support for their ideas both inside and outside their institutions. The role and strength of inter-institutional partnerships between community college and baccalaureate-granting institutions will also be addressed, as well as the factors that promote successful student matriculation from the community college.

7. **Broadening Participation in Undergraduate Research**, (*Co-sponsored by SOCED, YCC, CMA and WCC*) **Mary Boyd**, Department of Chemistry Georgia Southern University, Statesboro, Georgia, tel: (912) 681-5681 Fax: (912) 681-0699 mboyd@georgiasouthern.edu

   The benefits of undergraduate research, including increased faculty-student engagement and critical thinking skills, advancement of career and graduate study opportunities, higher retention in STEM fields, and the ability to work with the ambiguity of open-ended questions, have a stronger impact on students from groups underrepresented in the sciences. The symposium will include presentations on the importance of undergraduate research opportunities for underrepresented students, as well as the successful approaches to recruit underrepresented students, including program revision, partnerships between institutions and funding opportunities.

8. **Successful Student Affiliates Chapter Posters (Sci-Mix), Andrea Bennett**, Student Affiliates Program, American Chemical Society, 1155 Sixteenth Street, NW, Washington, DC 210036, tel: (202) 872-6166, a_bennett@acs.org

9. **Teaching Chemistry to the Visually Impaired, David Wohlers**, Division of Science, Truman State University, Kirksville, MO 63501 tel: (660) 785-4625, fax: (660) 785-4045, wohlers@truman.edu

   Data acquisition software and probes can now be accessed by speech software enabling visually impaired students more hands-on involvement in the chemistry laboratory. Recent funding by the NSF program on Research in Disabilities Education has supported the development of low-cost laboratory sensors to convert the visual observations of a chemical reaction into sound. Research detailing the

cognitive development affected by hands-on experience continues to unfold. This symposium will explore recent advances in this important area of chemical education.

10. **Development and Implementation of Learning Objectives in Chemistry Departments: A View of Progress at a Myriad of Institutions**, (joint with CPT) **Marcy Towns**, Chemistry Department, Purdue University, West Lafayette, IN 47907. (765) 496-1574, fax: (765) 494-0239 e-mail: mtowns@purdue.edu
    Currently, many chemistry departments are in the process of crafting goals and learning outcomes for their chemistry programs. Faculty must clarify their expectations for student learning, and consider how the curriculum and the pedagogy used in the classroom and laboratory matches their expectations for student learning. These efforts allow departments to develop cohesive curricula aligned with program objectives that are informed and shaped by formative and summative assessment. There is a need to communicate nationally about these efforts and share models. The goal of this symposium is to highlight the development and implementation of programmatic assessment at a range of institutions. Presenters will share learning objectives, associated assessment plans, and preliminary data.

11. **Developing A Safety Plan for Teaching Chemistry in the Home School Situation,** (*co-sponsored with CHAS*) **Frankie Wood-Black,** ConocoPhilips, Houston, TX, 77079, tel: (281) 293-4598, fax (918) 662-6693, Frankie.K.Wood-Black@conocophillips.com
    Learning is a constant task with a repetition being one of the tools that can be used to re-enforce the activity and knowledge. People tend to get complacent about a number of topics and the safe handling of materials is one that we as educators can not allow to happen. This symposium will focus on ways of including chemical health and safety and good laboratory practice into all aspects of the curriculum.

12. **Modernizing the Undergraduate Laboratory with Research and Instrumentation, Alex Grushow,** Dept. of Chemistry, Biochemistry & Physics Rider University, 2083 Lawrenceville Rd., Lawrenceville, NJ 08648, tel: (609) 896-5095 fax: (609) 895-5782, grushow@rider.edu
    Talks in this session will discuss methods used to modernize undergraduate laboratory instruction. Areas of particular focus will be the adaptation of research projects for instructional means and the use of modern state-of-research-practice instrumentation. Speakers will provide a description of their laboratory experiments, discuss barriers to implementation of their method, and provide data to indicate the measures of a successful implementation.

13. **Sustainability and Chemical Education: Industry's Perspective,** (cosponsored with I&EC and CEI) **Matthew A. Fisher**, Department of Chemistry, Saint Vincent College, 300 Fraser Purchase Road, Latrobe, PA 15650, tel: (724) 805-2356, matt.fisher@email.stvincent.edu **Martin Abraham,** Department of Chemical Engineering, MS305 University of Toledo, Toledo, OH 43606, tel: (419) 530-8092, fax: (419) 530-8086, Martin.Abraham@UToledo.edu
    Sustainability in the practice of chemistry is increasingly a priority for many areas, including industry. This symposium will focus on the needs of the chemical industry in understanding the challenge of sustainability, how it is affecting chemical industry, and what aspects of sustainability are important for students (undergraduate and graduate) who seek careers in chemical industry. *(invited speakers only)*

14. **Using Social Networking Tools to Teach Chemistry**, **Andrea Gay**, Washington University in St. Louis, St. Louis, MO 63130-4899, agay@wustl.edu, tel: (314) 935-8465, **Harry E. Pence**, SUNY-Oneonta, Oneonta, NY 13820, pencehe@oneonta.edu, tel: (607) 436-3179.
    During the past few years there has been a surge of interest in internet programs that fall under the general category of social networking. The most obvious social applications are those used by our students, such as FaceBook, MySpace, Flickr, and Friendster. Other examples of social networking software would be blogs, plogs (project logs), vlogs (video logs), wikis, RSS feeds, social tagging, and podcasts. Although these various programs are widely used, there has been relatively little discussion of how they might be used to teach chemistry. The goal of this symposium is to explore the affordances and constraints of these approaches as they specifically apply to chemistry instruction.

15. **Communicating Chemistry, John C. Kotz,** Department of Chemistry, SUNY Oneonta, Oneonta, NY, 13820, tel: (607) 436-2454, Kotzjc@oneonta.edu, **Leonard Fine**, Department of Chemistry, Columbia University, New York, NY 10027, tel: (212) 854-2017 fine@chem.columbia.edu

    This symposium will consist of invited and contributed papers on information and communication literacy in chemistry. Chemistry has changed in the last several decades, so the symposium will center on the skills and resources our students can use in 21st century chemistry. Relevant papers can include the use of books, magazines, and newspapers, as well as wikis; blogs; audio and video podcasts; educational games; online databases (such as Chemical Abstracts and Google Scholar); and the organization and presentation of quantitative and qualitative information (with, for example, molecular modeling tools, spreadsheets and presentation tools).

16. **Synthesizing New Chemists: A Discussion in Practitioner Development, Gautam Bhattacharyya**, Department of Chemistry, Clemson University, Clemson, SC, 29634 tel: (864) 656-1356 gautamb@clemson.edu

    The emerging discourse in the chemistry community regarding the training of future practicing chemists has raised some concerns about adequately preparing future professional chemists capable of tackling the challenges of the 21st century. Establishing an epistemology of professional practice for chemists should be an integral part of this discussion. Doing so will help students develop in the classroom and the laboratory. This symposium will explore recent research in practitioner development in chemistry.

17. **Impending Issues in Chemistry Teacher Education, William Hunter**, Department of Chemistry, Illinois State University, Normal, IL, USA, tel: (309)438-7905 wjhunte@ilstu.edu

    This symposium will highlight strategies used by teacher education institutions to deal with important issues they face in science and chemistry teacher education. Some of the issues will include teaching teachers to meet standards, accreditation, building comprehensive programs, promoting cognitive change in students and state testing to meet science requirements of NCLB.

18. **Research in Chemical Education – William Hunter,** Department of Chemistry, Illinois State University, Normal, IL, USA, wjhunte@ilstu.edu, and **Douglas Mulford,** Department of Chemistry, Emory University, Atlanta, GA, 30322, tel: (404) 727-6989 douglas.mulford@emory.edu.

    This symposium, sponsored by the CHED Committee on Chemical Education Research, is a forum for research conducted on the teaching and learning of chemistry at any level. Presentations will address: 1) the motivation for the research and the theoretical bases in which it is grounded, 2) the methods used to gather and interpret data, and 3) the findings and their significance interpreted in light of theory and method. Authors are being strongly encouraged to bring copies of an extended abstract to share with the audience.

19. **Bringing Authentic Research into the Undergraduate Laboratory, Donald Wink,** Department of Chemistry, University of Illinois at Chicago, Chicago, IL, tel: (312) 413-7383, dwink@uic.edu, and **Gabriela Weaver**, Department of Chemistry, Purdue University, West Lafayette, IN 47907, tel: (765) 496-3055, gweaver@purdue.edu (Invited papers only)

    Students often cannot participate in undergraduate science and mathematics research programs until they are well advanced in their undergraduate education. The National Science Foundation, through its Undergraduate Research Centers program, now supports studies of methods to provide students with authentic research experiences early in their college work. Papers in this symposium will cover the different aspects of one of these URC's, the Center for Authentic Science Practice in Education.

20. **NSF Catalyzed Innovations in the Undergraduate Curriculum, Susan Hixson,** Division of Undergraduate Education, National Science Foundation, Arlington, VA, tel: (703)292-4623, fax (703) 292-9015, shixson@nsf.gov *(Invited only)*

This symposium will feature speakers from projects funded by NSF that are developing educational materials or strategies aimed at improving the learning of chemistry by undergraduates with diverse backgrounds and career aspirations.

21. **Bridging Research and Service: The Discovery Corps Experience, Rachel Morgan Theall,** Department of Chemistry, University of Arizona, 85721 Tel: (520) 626-0544 rmtheall@email.arizona.edu (*Invited only*)
    In 2004 the National Science Foundation Division of Chemistry initiated the Discovery Corps Fellowship (DCF) program to support projects that combine research and service in areas of national priority. Through DCF, postdoctoral and senior (mid-career) fellows are provided unique, and conceivably "non-traditional," professional development and training opportunities. This symposium will highlight many of the innovative projects, past and current.

22. **Educating the Public About the Challenges for Improving the Quality of Drinking Water**, **Cang Li**, R&D Department, Selecto Scientific, Inc., Suwanee, GA 30024, Tel: (678) 475-3459, cang@selectoinc.com
    Water, a natural resource, is limited and poorly distributed. Pollution and the lack of water are among the biggest public health problems in 21st century. Worldwide, more than 10 million people, half of them children, die annually from diseases related to unsafe drinking water. This symposium will provide insight for teachers, students, and the educated public into the nature of water pollution, regulations, water treatment technologies, and public health and safety.

23. **Exploring and Exploiting Nature with Biomimetics, Soumya Mitra**, (Graduate Student Symposium *Co-sponsored by WCC and BIO*) Department of Chemistry, The Ohio State University, Columbus, OH 43210, Tel. (614) 292 4459 smitra@chemistry.ohio-state.edu (*Invited only)*
    This symposium takes a multidisciplinary approach to the utilization of nature as a platform for technological advancement in the field of biomimetics. The symposium will feature talks from a number of disciplines including organic, bioinorganic, biochemistry, computational chemistry, chemical biology and biophysics. The knowledge gained would not only be applied towards our overall understanding of chemical sciences, but also correlate and appreciate the connection between chemistry, biomimetic strategies and medical sciences.

24. **Award Symposium** *George C. Pimentel Award in Chemical Education* - Symposium in honor of Truman A. Schwartz. **Wayne C. Wolsey**, Department of Chemistry, Macalester College, St. Paul, MN 555105-1899. tel: (651)-696-6352, fax: (651)-696-6432, e-mail: wolsey@macalester.edu (invited only)
    The Liberal Art of Chemistry - The purpose of this symposium is to investigate and celebrate the place of chemistry within the corpus of human knowledge, and in particular, the liberal arts. It is based on the contention that some understanding of chemical phenomena, concepts, and methodology should be part of the intellectual store of every educated man and woman. Such knowledge, is of course, essential for those who will contribute to the continued growth of the molecular sciences. But it is also a powerful preparation for a wide range of careers and, indeed, for a rich and full life.

25. **Award Symposium** *ACS Award for Achievement in Research for the Teaching & Learning of Chemistry* - Symposium in honor of Dudley J. Herron. **Charles R. (Dick) Ward**, Chemistry Department, University of North Carolina – Wilmington, Wilmington, NC. tel: (910) 962-3216, fax: (910) 962-3013, e-mail: ward@uncw.edu (invited only)
    This symposium will honor J. Dudley Herron, the first recipient of the ACS Award for Achievement in Research for the Teaching and Learning of Chemistry, in recognition of his contributions to the development of the field of research in chemical education.

26. **Applications of Electronic Homework Systems, Sally Hunnicutt,** VCU Department of Chemistry, 1001 W. Main St., P.O. Box 842006, Richmond VA 23284-2006, tel: (804)827-0531, shunnic@vcu.edu

This symposium will examine the ways in which electronic homework systems such as WebAssign, LON-CAPA, or OWL are used in chemistry courses across the curriculum. Presenters may discuss the advantages of different systems, the types of problems assigned, how electronic homework supplements classroom activities, training, and how electronic homework systems affect student learning.

27. **Building Connections to Non-Major's Chemistry, Karen Anderson,** Madison Area Technical College. Chemistry Department, 3550 Anderson St., Madison, WI 53704 tel: (608) 246-6496 fax: (608)-246-6475, klanderson@matcmadison.edu

    Exploring affective issues and providing a contextual framework for essential chemistry concepts go a long way towards facilitating student learning of topics found in general, organic, and biological (GOB), liberal arts, and other non-major chemistry courses. This symposium offers novel approaches, techniques and processes to improve student motivation, confidence and ultimately learning linked to fundamental chemistry content applied to a student's desired area of study.

28. **Process-Oriented Guided Inquiry Learning (POGIL), Richard Moog**, Department of Chemistry, Franklin & Marshall College, P.O. Box 3003, Lancaster, PA 17604-3003. (717) 291-3804 (voice), (717)291-4343 (fax), rick.moog@fandm.edu, **Alexsa Silva**, Department of Chemistry, Binghamton University (SUNY), Binghamton, NY 13902, tel: 607) 777-2208, fax: (607) 777-4478, e-mail: asilva@binghamton.edu (Invited papers only)

    POGIL is a student-centered instructional approach combining group learning and guided inquiry, with an emphasis on the development of important process skills. This symposium will include presentations concerning all aspects of this pedagogic approach, across a range of courses and institutional types, including lessons learned from classroom experience, the assessment of student learning outcomes, and the development of new materials and their use. The POGIL Project is supported through the NSF CCLI Program (DUE-0231120).

29. **Chemical Sensors in Undergraduate and Graduate Education, Niina J. Ronkainen-Matsuno**, Department of Chemistry, Benedictine University, 5700 College Road, Lisle, IL, 60532-0900, tel: (630) 829-6549, fax: (630) 829-6547, NRonkainen@ben.edu

    Chemical and biological sensors are employed in a variety of disciplines, ranging from electrochemical analysis, biomedicine, and aeronautics, to industrial process control and environmental monitoring. The popularity and widespread use of chemical sensors in modern society has created a need to incorporate this technology into the teaching curriculum as laboratory experiments, research projects, seminars, and lectures. This symposium explores ways to introduce students to sensor devices and is open to all topics related to sensors education.

30. **Revitalizing the Undergraduate Descriptive Inorganic Chemistry Course – Innovations, Ideas, Tricks, and Tools. Guy Crundwell**, Chemistry Department, Central Connecticut State University, New Britain, CT 06050, tel. (860) 832-2682, fax (860)832-2704, crundwellg@ccsu.edu

    Most ACS accredited BS Chemistry programs include Descriptive Inorganic Chemistry as either a core course in the curriculum or as a required advanced course. Many of the textbooks available for the course introduce material by chapters that cover elements by group. This results in the material being approach in an 'encyclopedic' fashion. Whether faculty chose these textbooks or alternative approaches, the material covered in descriptive inorganic chemistry is under constant flux. Therefore this session aims to highlight both novel faculty approaches to the dissemination of course material as well as address the nature of what is covered in the descriptive chemistry course.

31. **Center for Workshops in the Chemical Sciences (CWCS): Promoting Innovation in Chemical Education Through Workshops and Community Building. D. M. Collard**, School of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, GA 30332, (404) 894-4026, fax (404) 894-7452, david.collard@chemistry.gatech.edu; **L. J. Kaplan**, Dept. of Chemistry, Williams College, Williamstown MA 01267, tel. (413) 597-3303, fax (413) 597-4116, lkaplan@williams.edu; **J. C. Smith**, Dept of

Chemistry, tel. 651-3873, Georgia State University, P.O. Box 4098, Atlanta, GA 30302-4098, tel. (404) 651-1416, chejcs@langate.gsu.edu (invited papers only)

The Center for Workshops in the Chemical Sciences (CWCS) has been supported by the NSF, DUE, CCLI program for six years. With a new grant, we will continue conducting workshops and evaluating the impact of the Program while we develop a Community of Scholars in several topical areas derived from workshop activities. Directors of the CWCS will present an overview of the workshop program while instructors of individual workshops will discuss the content and scope of their workshops. In addition, workshop alumni will discuss the impact participation in a workshop has had on their ability to develop new pedagogical material.

32. **Beyond the Bench: Non-Traditional Careers in Chemistry,** *(Co-Sponsored with CHAL)* **Justin Hasford,** Attorney at Law, Finnegan Henderson Farabow, Garrett & Dunner, LLP, Washington, DC 20001-4413, tel: (202) 408-4175, fax (202) 408-4400 justin.hasford@finnegan.com (invited only)

    Increasingly, chemists are seeking careers beyond traditional laboratory research positions. This symposium will explore such non-traditional careers in chemistry, with presentations by speakers who have pursued these careers "beyond the bench." Careers in writing and communication will be discussed, as well as careers in business and organizational management. In addition, careers in patent law will be described from the perspectives of a patent litigator, a Patent Office Examiner, and a law student.

33. **Going with the Flow: Water Sustainability: Past, Present, Future.** *(Co-Sponsored with HIST)* Mary Virginia Orna, Department of Chemistry, College of New Rochelle, New Rochelle, NY 10805, Phone: (914) 654-5302, Fax: (914) 654-5387, Email: mvorna@cnr.edu (Invited only)

    An overview of water purification from ancient times to the present including: Instrumental and commercial developments of water purification from 1900-2000; Development of ion exchange for water purification: Low impact methods of water purification for developing countries: and Future of water purification for the world.

34. **General Papers, Tyson Miller**, Department of Chemistry; University of Connecticut; 55 North Eagleville Road, Unit 3060; Storrs, CT 06269-3060; tel. (860) 486-3052; tyson.miller@uconn.edu

35. **General Posters, Richard Schwenz**, Department of Chemistry, University of Northern Colorado, Greeley, CO, 80639, tel: (970) 351-1287. Richard.Schwenz@unco.edu