



18th Biennial Conference on Chemical Education Registration Book

July 18 – 22, 2004
Iowa State University
Department of Chemistry
Ames, Iowa 50011

www.chem.iastate.edu/bcce



Biennial Conferences on Chemical Education
are sponsored by the Division of Chemical Education
of the American Chemical Society



IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

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The Organizing Committee of the 18th BCCE gratefully acknowledges the generous contribution of the corporations, institutions, and societies who are sponsoring the conference.

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An Invitation to the 18th BCCE

Colleagues have described the Division of Chemical Education's Biennial Conference on Chemical Education as a "transforming experience." Your chance to have an experience like this will happen again at the 18th BCCE this summer at Iowa State University in Ames. A BCCE is exciting—and maybe transforming—because colleagues who are committed to excellence in chemical education gather to share expertise and experience. The BCCEs are the largest gathering of chemical educators in the world and truly reflect the wide interests and talents of people who teach chemistry in high schools, colleges, universities, as well as people in industry and government who have an interest in chemical education.

The program committee for the 18th BCCE is planning an amazing variety of workshops, presentations, plenary speakers, keynote speakers, exhibits, and posters designed to provide you with new ideas, strategies, and techniques for involving your students in active learning. At any time during the conference I'm sure you'll find more than one workshop, presentation, exhibit, or activity that will stimulate your interest. Usually it will be a matter of deciding between conflicting schedules about what you're going to do.

You'll also find times to reflect and talk with your colleagues, to discuss something that you've seen, heard, or done and share your ideas. There will be great social events and things to see and do, perhaps, even time to relax. The BCCEs are truly the best deal someone interested in chemical education can get and can be transforming. I encourage you to join your colleagues in Iowa this summer and I look forward to seeing you there.

John Clevenger

Chair, Division of Chemical Education
American Chemical Society



Gilman Hall, home of the Chemistry Department of Iowa State University.

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HELP WANTED: *Please contact Tom Greenbowe if you are interested in being a 18th BCCE reporter. The reporters submit a report about the conference to the Journal of Chemical Education.*

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HELP WANTED: *We need five individuals to volunteer to take 35 mm photos or >200 dpi digital images of the 18th BCCE. We can provide the cameras. Contact Tom Greenbowe if you are interested in being a part-time photographer at the 18th BCCE.*

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18th BCCE Schedule at a Glance

SUNDAY, JULY 18, 2004

MORNING	8K, 4K Iowa Games Fun Run	7:00 a.m., 8:00 a.m.	ISU Cross-Country Course
	Workshops	9:30 a.m. – 5:00 p.m.	Gilman Hall
AFTERNOON	Symposia	1:30 p.m. – 4:00 p.m.	Gilman, Molecular Biology
EVENING	Opening Ceremony	7:15 p.m.	C.Y. Stephens Auditorium
	Plenary Lecture*	7:35 p.m.	C.Y. Stephens Auditorium
	18th BCCE Social Hour	8:30 p.m. – 9:00 p.m.	C.Y. Stephens Auditorium

MONDAY, JULY 19, 2004

MORNING	Plenary Lecture*	8:00 a.m. – 9:00 a.m.	C.Y. Stephens Auditorium
	Workshops	9:30 a.m. – 5:00 p.m.	Gilman Hall
	Symposia	9:25 a.m. – 12:00 noon	Scheman Building, Gilman
AFTERNOON	Symposia	1:30 p.m. – 4:00 p.m.	Scheman Building, Gilman
	Keynote Address*	4:00 p.m.	Benton Auditorium
EVENING	Sci-Mix & Hawaiian Island Night	7:00 p.m. – 9:00 p.m.	Scheman Building
	(Sponsored by Mc-Graw-Hill Publishers)		(Poster Session / Exhibit Area)

TUESDAY, JULY 20, 2004

MORNING	Plenary Lecture*	8:00 a.m. – 9:00 a.m.	Hilton Coliseum
	Workshops	9:30 a.m. – 5:00 p.m.	Gilman Hall
	Symposia	9:25 a.m. – 12:00 noon	Scheman Building
AFTERNOON	Symposia	1:30 p.m. – 4:00 p.m.	Scheman Building
	Keynote Address*	4:00 p.m.	Benton Auditorium
EVENING	Banquet	6:15 p.m. – 7:45 p.m.	Hilton Coliseum
	Demonstration Extravaganza	7:45 p.m. – 8:30 p.m.	Hilton Coliseum

WEDNESDAY, JULY 21, 2004

MORNING	Mole Breakfast	6:02 a.m.	MWL Dining Hall
	Plenary Lecture*	8:00 a.m. – 9:00 a.m.	C.Y. Stephens Auditorium
	Workshops	9:30 a.m. – 5:00 p.m.	Gilman Hall
	Symposia	9:25 a.m. – 12:00 noon	Scheman Building, Gilman
AFTERNOON	Symposia	1:30 p.m. – 4:00 p.m.	Scheman Building
	Keynote Address*	4:00 p.m.	Benton Auditorium
EVENING	Galileo Players	7:00 p.m. – 8:00 p.m.	C.Y. Stephens Auditorium
	Closing Ceremony	8:00 p.m. – 8:20 p.m.	C.Y. Stephens Auditorium
	18th and 19th BCCE Committees		
	Ice Cream Social	8:20 p.m. – 9:20 p.m.	C.Y. Stephens Auditorium
	(Sponsored by the <i>Journal of Chemical Education</i> and 2YC ₃)		

THURSDAY, JULY 22, 2004

MORNING	Workshops	9:00 a.m. – 12:00 noon	Gilman Hall
	Symposia	9:15 a.m. – 12:00 noon	Scheman Building, Gilman
	Keynote Address*	9:15 a.m.	150/154 Scheman Building

***Plenary Lecture and Keynote Address speakers and topics listed on p.36.**

Iowa State University: The setting for the 18th BCCE

It's where George Washington Carver, who discovered hundreds of uses for the peanut and other crops, learned about science and agriculture. Where Carrie Chapman Catt, who would lead American women to the ballot box, organized one of the first female military drill units. Where John Vincent Atanasoff, a physics and math professor, and his graduate student Clifford Berry invented the first electronic digital computer. It's where the FAX machine was invented.

In 1942, Iowa State College's Frank H. Spedding, an expert in the chemistry of rare earth metals, and Harley A. Wilhelm set up and directed a chemical research and development program for producing pure uranium for the Manhattan Project. Their process produced the uranium that was used in the first successful self-sustaining chain reaction initiating the controlled release of nuclear energy at the University of Chicago in December, 1942.

Iowa State University is a major research university located on a lush, sprawling campus in Ames, Iowa. The university got its start more than a century ago the nation's first co-educational land-grant — a university dedicated to the idea that higher education ought to be open to all, practical and shared with people outside the campus. Iowa State grew from agricultural roots and has a long-standing well-earned reputation for scientific and technological advances in agriculture, veterinary medicine, home economics, science and engineering. Over the past century, it has grown into a research university of international stature, with excellent programs not only in scientific and technical fields, but in the humanities and arts as well. ISU offers bachelor's, master's and doctoral degrees through eight colleges and the graduate college.

The 34 faculty members of the Department of Chemistry have offices and research laboratories housed primarily in Gilman Hall. Henry Gilman, the father of organometallic chemistry and a faculty member at ISU, was awarded the Priestley Medal in 1978. Spedding and Wilhelm Halls, part of the U.S. Department of Energy's federal research facility called Ames Laboratory, are located adjacent to Gilman Hall. ISU is listed as third in the number of patents awarded to U.S. universities.

ISU varsity sports teams (the Cyclones) are members of the NCAA Big-12 Athletic Conference. In 2002, ISU's Cael

Sanderson became the only undefeated NCAA college wrestler. His record is 159-0. Cael was a four time NCAA national champion.

With a student population of 25,000 and a town population of 25,000, Ames is a suburban area surrounded by picturesque fields of corn and soybeans.

Jane Smiley was an Iowa State University faculty member when she wrote her novel, "Moo". ISU served as the book's physical setting and provided plenty of character development. Some of the buildings and settings discussed in the book are still present, i.e. "Old Meats" and the prized agronomy "garden". If you want to get an early introduction to Iowa State, read this book.

**"Is this heaven?"
"No, it's Iowa!"**

Iowa is known for excellence in education. ISU along with the University of Iowa and the University of Northern Iowa are the three state public universities serving Iowa. Iowa has fourteen community colleges and more than twenty private colleges. Iowa's public elementary and secondary schools are among the best in the United States.

Iowa is the heart of the farm belt of the mid-west prairie states. Grant Wood's painting "American Gothic" captures the hard working farm ethic instilled in Iowans. The Mississippi and Missouri Rivers frame the east and west borders of the state, where gambling is permitted on licensed operating "Mississippi River style paddle-wheel" boats. There are no potato fields and the only good skiing is done cross-country or on lakes.

One of four states designated as topographically challenged, Iowa has been the setting of four major Hollywood films "Cold Turkey" (starring Dick Van Dyke), "Twister" (starring Helen Hunt), "Bridges of Madison County" (starring Clint Eastwood), and "Field of Dreams," starring Kevin Costner. In a perfect July summer twilight, Shoeless Joe Jackson surveyed his baseball field and surrounding rural countryside and asked, "Is this heaven?", Costner replied, "No, it's Iowa!"

Program Overview for 18th BCCE

The 18th Biennial Conference on Chemical education will take place at Iowa State University, Ames, Iowa, from July 18 through July 22, 2004. You are invited to be one of over 1,500 attendees who are expected in Ames. Come to present a paper, participate in a workshop, do a poster presentation, or attend the sessions. If you have never seen the corn and soybean fields of Iowa, be prepared to view over fifteen shades of green!

For the past two years, we have been working diligently to develop a program that you will find interesting and useful. Our national committee has worked hard to make sure that all levels of chemistry teachers will have sessions and workshops that will help improve how chemistry is taught and how students learn. All of the information about the conference, sessions, workshops, speakers, etc. can be found on our Web site:

www.chem.iastate.edu/bcce/

There will be symposia on green chemistry, nano-technology, teaching chemistry, the two-year college program, forensic chemistry, using computers to teach chemistry, assessing students' understanding of chemistry, and chemical education research. The program for the 18th BCCE includes over 60 workshops and 725 individual presentations. A spacious exhibition area will include over 60 exhibition booths as well as a hospitality center.

While you are in the Midwest, you will want to take advantages of the opportunity for day trips and/or travel to some historic places. Information on tours and other travel information is included in the Registration Book. The following is an outline of events that are planned for the 18th BCCE.

SUNDAY, JULY 18, 2004

We will start our day with an 7:00 a.m. 8K (8:00 a.m. 4K) Iowa Games Cross-County Race and Fun Run at the ISU NCAA national championship cross-country course. Workshops begin at 9:30 a.m. The 18th BCCE Golf Outing is at Veenker Golf Course (www.fpm.iastate.edu/veenker). Tee times are from 11:30 a.m.–1:30 p.m. Call (515) 294-9493 to make a reservation. \$26.50/person walking and \$39.50/person with cart. Symposia sessions go from 1:30 p.m.–4:00 p.m. The highlight of the program for Sunday evening will be the official opening ceremonies at C. Y. Stephens Auditorium. The first plenary speaker will be Firouz Naderi, Director of Solar System Exploration Programs and Manager of the Mars Exploration Program, NASA's Jet Propulsion Laboratory. Dr. Naderi's lecture will be followed by a social hour and reception, held in C.Y. Stephens Auditorium antechamber areas.

MONDAY, JULY 19, 2004

Monday morning, 8:00 a.m., we will begin with our second Plenary Lecture in C.Y. Stephens Auditorium. The speaker will be Dr. John K. Gilbert, Professor of Chemistry, Department of Chemistry, University of Reading, United Kingdom–Great Britain. Dr. Gilbert is the current editor of the *International Journal of Science Education*. Symposia and workshops begin at 9:25 a.m. The exhibit area opens at this time. Also, the 18th BCCE is host to

the "Women in Chemistry" exhibit sponsored by the Hach Scientific Foundation and the Chemical Heritage Foundation. This exhibit is located on the first floor of the Scheman Building. Monday afternoon will feature Dr. George Boggs as the Keynote Speaker. He is a chemist and the current President of the American Association of Community Colleges. Monday evening, 7:00 p.m.–9:00 p.m. is Hawaiian Island Night and the Sci-Mix poster session, sponsored by McGraw-Hill Publishers. The exhibits will be open. There will be a cash bar and there will be two live bands. A flowered or tropical themed shirt is one of your tickets to admission to this event.

TUESDAY, JULY 20, 2004

Tuesday morning, 8:00 a.m., we will begin with our third Plenary Lecture in Hilton Coliseum. The speaker will be Dr. Charles Casey, Professor of Chemistry, Department of Chemistry, University of Wisconsin-Madison. Dr. Casey is the current President of the American Chemical Society. Tuesday afternoon will feature Dr. Paula Heron, Department of Physics University of Washington - Seattle as the Keynote Speaker. Her talk on physics education research will show how this area can be used in chemistry instruction. Tuesday evening at 6:15 p.m. is the 18th BCCE Banquet. It will be held in Hilton Coliseum and feature traditional Iowa cuisine. Following the banquet will be a chemistry demonstration extravaganza with Dr. John Fortman as the master of ceremonies.

WEDNESDAY, JULY 21, 2004

Wednesday morning, 8:00 a.m., we will begin with our fourth Plenary Lecture in C.Y. Stephens Auditorium. The speaker will be Dr. Lillian McDermott, Professor of Physics, University of Washington–Seattle. Dr. McDermott is the recipient of the Orstead Medal. Her physics education research group has contributed towards changing the way introductory college physics is taught. Wednesday afternoon, Dr. Roy Tasker, Professor of Chemistry, School of Science, University of Western Sydney, NSW Australia, will be our keynote speaker. Dr. Tasker has developed highly successful and effective 3D computer simulations and animations of chemical processes. The evening program will feature a play by the Galileo Players, followed by the official closing ceremonies and the passing of the torch to the 19th BCCE planning group. The evening will close with the traditional ice cream social, sponsored by 2YC₃ and the *Journal of Chemical Education*.

THURSDAY, JULY 22, 2004

There will be symposia and workshops from 9:15 a.m.–12:00 noon. The conference closes at noon. We sincerely hope that the program, speakers, and the opportunities to meet with your colleagues and exchange ideas will make this conference a valuable and important event. The blue-collar climate, set against the backdrop of an astonishingly flat landscape, should make this one conference to remember. Dr. Bassam Shakhshiri, Professor of Chemistry, University of Wisconsin–Madison will be our keynote speaker Thursday morning. He will lead an interactive discussion titled "Chemistry in the Classroom and in the Community: The Challenge of Citizenship for the Teacher."

www.chem.iastate.edu/bcce/

Pre-Conference Events

ACS DivCHED Examinations Institute

Seven working committees of the American Chemical Society Division of Chemical Education (ACS DivCHED) Examinations Institute will be meeting on Saturday and Sunday of the 18th Biennial Conference on Chemical Education. The committees will be meeting at the Hotel at the Gateway Center. Each committee will be engaged in the highly interactive processes of preparing questions for the next edition of the ACS examinations. Since the work of these committees is well underway and since the work involves preparing questions and problems for student examinations, these pre-conference committees are open only to the current committee members or guests of the committee. Guests of the committee are welcome after obtaining permission to attend a committee meeting from the Director of the Examinations Institute and the Chair of the Committee. Interacting with the examination committee members is an excellent way to learn how the examination problems are constructed and what topics are emphasized.

If you are interested in being a committee member for future ACS Examinations or observing/interacting with one of the working committees at the 18th BCCE, please contact

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For more information on the ACS Examinations Institute, visit <http://www.uwm.edu/chemexams>

Also, consider attending the following workshop **W16: ACS Exams and Meeting State Standards for High School Chemistry** (refer to p.30).

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Pre-Conference

ACS Conference

Critical Issues and Effective Practices in Chemistry-Based Laboratory Technology Education. (see also p.29)

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This is a two and a half-day conference put on by the American Chemical Society to develop industry/academic alliances from around the US. It will be held Friday, July 16 to Sunday, July 18, 2004 at the Gateway Center. Partial participant subsidies will be provided by the ACS publication ChemTechLinks. Representatives from industry and academe are invited to attend this conference.

To register visit the ChemTechLinks Web site at www.chemtechlinks.org for a registration form and more information.

Pre-Conference Workshops

See pp 29-33 for a complete workshop listing.

W1: Developing, Testing, and Assessing Online Intercollegiate Cooperative Learning Activities.

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CO-PRESENTERS

Erica Harvey, Fairmont State College; George Long, University of Vermont; Alex Grushow, Rider College; George Shalhoub, LaSalle University; Lisa Lever, University of South Carolina–Spartanburg

During this 4-day workshop, which starts on Thursday, July 15, 2004, you will be introduced to the materials developed to support online intercollegiate cooperative learning activities. You will participate through use of a sample on-line module and discuss implementation, facilitation, and assessment issues.

Participants will also collaborate to create their own on-line intercollegiate cooperative learning activity. Participants should be familiar with tools such as Excel or Mathcad. We will review modules that have been developed and tested by the physical chemistry on-line consortium involving over 500 students at 23 institutions during the past 5 years. Visit <http://pcol.ch.iup.edu>

We welcome chemists from all disciplines who are interested in innovative materials and teaching techniques. This workshop is supported by NSF grant DUE #9950809. Four days room and board support will be provided to participants of the workshop. This workshop begins Thursday afternoon, July 15, 2004 and goes through Sunday afternoon, July 18, 2004. Pre-conference on-campus housing and dining is available.

Additional information may be found at http://bluehawk.monmouth.edu/~tzielins/PCOL/Bcce%20PCOL%20Workshop%20Schedule9_17_03.htm

See also p.29. Fee: paid for by sponsor.

W2: ACS “Chemistry” Workshop.

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Have you been trying or considering an activity-based, student-centered approach to teaching your general chemistry course? The new textbook, “Chemistry” (a project of the American Chemical Society), is designed to support and reinforce this approach. This textbook project is part of a bold new initiative to re-think and re-work the general chemistry course that too many students perceive as a barrier rather than a pathway to their future. “Chemistry” includes traditional chemistry concepts in a non-traditional order using pedagogy built on active learning and group interactions. The concepts and principles in “Chemistry” are developed as often as possible by the analysis of data obtained in classroom activities. Because the approach requires more effort on the part of both students and instructors and what we are trying to accomplish may be unfamiliar, the ACS is supporting an intensive 1.5-day workshop before the BCCE to help prospective users develop a better understanding of the content and pedagogy of this new textbook.

The workshop will be conducted by current faculty who have used this new textbook in their classrooms. Besides demonstrating how to use “Chemistry” activities and pedagogy, they will share their experiences from using this innovative curriculum in their classrooms. This workshop begins Thursday afternoon, July 15, 2004 and goes through late afternoon, Friday, July 18, 2004. Pre-conference on-campus housing and dining is available. See also p.29. Fee: paid for by sponsor.