



Welcome to the
SOCIETY
COMMITTEE ON
EDUCATION

American Chemical Society
Education Division

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Message from the Chair

**SOCIETY
COMMITTEE ON
EDUCATION**

Dear SOCED Members:

We are very pleased to welcome you to the American Chemical Society Committee on Education (SOCED). I want you to feel a part of this Committee from the start so, working with the staff of the Education Division, we have put together this manual to help you get acquainted with SOCED, ACS, and your role on the Committee.

The mission of the Society Committee on Education is, through its policies and procedures, to:

- Support the development and implementation of ACS education programs that bring the wonder, excitement, opportunities, and challenges of modern chemical science to students and chemical professionals and allied scientists at all levels; and,
- Develop reports and recommendations to the Board and Council that help define the Society's policies on issues related to science education, especially chemical education, for the strategic development of current and future ACS educational activities, and the support of science education reform nationwide.

In this handbook, you will learn about the programs offered through the ACS Education Division, how the Division is organized, information about your role on the Committee, and information on how our budgets are organized. In addition, there is information about how SOCED fits among the many other committees in the Society, a list of acronyms and their meanings, plus background information on the Committee and how it operates.

I look forward to working with you and encourage your full participation in all the discussions and activities of the Committee. We need to hear your ideas and opinions so we can make the best choices possible as we guide the education policies of the ACS.

Bryan Balazs, Chair
Society Committee on Education

The American Chemical Society (ACS)

ACS Structure

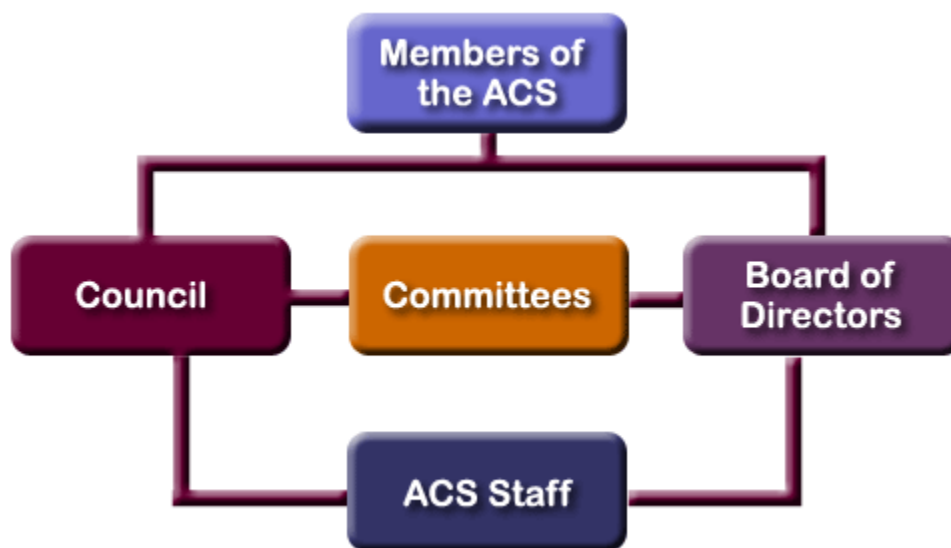
The American Chemical Society (ACS) is a self-governed individual scientific membership organization that consists of approximately 160,000 members at all degree levels and in all fields of chemistry. The organization provides a broad range of opportunities for peer interaction and career development, addressing professional and scientific interests.

"The mission of the American Chemical Society is to advance the broader chemistry enterprise and its practitioners for the benefit of Earth and its people"

The ACS is divided geographically into 189 local sections. Members of the Society are automatically assigned to the local section closest to their address of record. ACS local sections enable Society members to interact with chemists in their community, participate in professional development programs, and promote the public understanding of chemistry. A member may only belong to one local section.

The ACS is also divided into 33 technical programming units known as divisions. Divisions of the ACS provide services and programming for each of 33 areas of chemistry, such as organic chemistry, inorganic chemistry, and chemical technicians. A member may belong to as many divisions as he or she chooses.

The Society is governed through a series of committees that are overseen by the ACS Board of Directors and the ACS Council.



The ACS Council is composed of elected representatives from each of the 189 local sections and 33 technical decisions. The Council also includes the President, President-Elect, all past Presidents, the Executive Director, and the Secretary of the ACS. The President of the Society presides over Council.

The ACS Board of Directors is comprised of the President, the President-Elect, the immediate Past President, six District Directors (elected from geographic regions), and six Directors-at-Large. The Board of Directors is the legal representative of the Society and administers all property, funds and

affairs of the Society. The Board of Directors is presided over by the Chair of the Board who is elected by the members of the Board on an annual basis.

ACS Committees

The committees of ACS can be classified into one of four basic categories: Society, Council, Board, and Joint Board-Council.

Society Committees

There are two Society Committees: Budget and Finance and **Education** (SOCED). Members of these committees are appointed by the President and the Chair of the Board. Society Committees are specified in the ACS Constitution. Society Committees report to both the ACS Council and the ACS Board of Directors. The Chair of each Society Committee must be a voting Councilor, and the body of the committee must be composed of no less than two-thirds voting Councilors. In addition, the committees may have advisory associate members and consultants.

Council Committees

Council Committees report to the ACS Council. They can be subdivided into three main classifications: Elected, Standing, and Other.

Elected: Members of the Elected Committees of Council must be elected by the Council body, and must be voting councilors.

- Committee on Committees (ConC)
- Council Policy Committee (CPC)
- Nominations and Elections (N&E)

Standing: Members of the Standing Committees of Council must be voting Councilors.

- Constitution and Bylaws (C&B)
- Divisional Activities (DAC)
- Economic and Professional Affairs (CEPA)
- Local Section Activities (LSAC)
- Meetings and Expositions (M&E)
- Membership Affairs (MAC)

Other: Other Committees of Council can have any composition as specified by the Council at the time of the committee's charter.

- Admissions
- Analytical Reagents
- Nomenclature, Terminology, and Symbols
- Project Seed (SEED)
- Technician Affairs (CTA)

Board Committees

Board Committees report to the ACS Board of Directors. They can be subdivided into four main classifications: Elected, Standing, Special, and Other.

Elected: Elected Committees of the Board are composed only of Board members.

- Executive Committee

Standing: Standing Committees of the Board are composed only of Board members.

- Grants and Awards (G&A)
- Professional and Member Relations (P&MR)
- Public Affairs and Public Relations (PA&PR)

Special: Composition as specified by the Board.

- Audits

- Corporation Associates
- Governing Board for Publishing
- Green Chemistry Institute Governing Board
- Pensions & Investments
- Planning

Other: Composition as specified by the Board.

- Board of Trustees, Group Insurance Plans for ACS Members
- Chemists with Disabilities (CWD)
- Clinical Chemistry
- Community Activities (CCA)
- Petroleum Research Fund (PRF) Advisory Board
- Ad hoc Committee on National Historic Chemical Landmarks

Joint Board-Council Committees

Joint Board-Council Committees report to both the Board of Directors and the Council. They can have any composition as specified in their charter.

- Chemical Abstracts Service
- Chemical Safety (CCS)
- Chemistry and Public Affairs (CCPA)
- Environmental Improvement (CEI)
- International Activities (IAC)
- Minority Affairs (CMA)
- Patents and Related Matters
- Professional Training (CPT)
- Publications
- Public Relations and Communications
- Science (ComSci)
- Women Chemists (WCC)
- Younger Chemists (YCC)

2007 Committee Chairs and Staff Liaisons

Society Committees	Chair	Staff Liaison	
Budget and Finance (B&F)	Dennis Chamot	Brian Bernstein	4415
Education (SOCED)	Bryan Balazs	Mary Kirchhoff	4562
Council Committees			
Elected			
Committee on Committees (CONC)	Neil Jespersen	Flint Lewis	4072
Council Policy Committee (CPC)	Catherine (Katie) Hunt/ Janan Hayes	Flint Lewis	4072
Nominations and Elections (N&E)	Barbara A. Sawrey	Flint Lewis	4072
Standing			
Constitution and Bylaws (C&B)	Ray A. Dickie	Marian Williams	4071
Divisional Activities (DAC)	Kevin J. Edgar	John Katz	8070
Economic and Professional Affairs (CEPA)	Martin L. Gorbaty	David Harwell	4431
Local Section Activities (LSAC)	Will E. Lynch	Mark O'Brien	4611
Meetings & Expositions (M&E)	Willem R. Leenstra	Kathleen Thompson	8072
Membership Affairs (MAC)	Joseph R. Peterson	Alan Hutchins	6266
Other			
Admissions	Darryl L. Prater	Debbie Fillinich	4369
Analytical Reagents	Paul A. Bouis	Robert Hauserman	*2120
Ethics	Margaret Cavanaugh	Eric Slater	4367
Nomenclature, Terminology and Symbols	Paul J. Karol	Patton Giles	55-3718
Project SEED	J. Philip Bays	Cecilia Hernandez	6169
Technician Affairs (CTA)	V. Michael Mautino	Blake Aronson	6108
Joint Board Council			
Chemical Abstracts Service (CCAS)	Patricia L. Dedert	Robert Massie	55-3866
Chemical Safety (CCA)	Alan A. Hazari	Robert Rich	6093
Chemistry and Public Affairs (CCPA)	James K. Rice	Caroline Trupp Gil	4098
Environmental Improvement (CEI)	Charles E. Kolb	Ray Garant	6063
International Activities (IAC)	Nina I. McClelland	Brad Miller	4088
Minority Affairs (CMA)	Linette M. Watkins	Norma Bartrum	7876
Patents & Related Matters (CP&RM)	Charles F. Hauff	David Smorodin	4510
Professional Training (CPT)	William F. Polik	Kirchhoff/Nelson	4589
Publications (PUBS)	Grace Baysinger	Bovenschulte/Davis	2111
Public Relations & Communications (CPRC)	Russell W. Johnson	Nancy Blount	4440
Science (COMSCI)	Carolyn Ribes	John Katz	8070
Women Chemists (WCC)	Amber S. Hinkle	Felicia Dixon	6334
Younger Chemists (YCC)	Katherine C. Glasgow	William Scurry	6262
Board Committees			
Standing			
Grants & Awards (G&A)	Eric C. Bigham	Martha Lester	4085
Professional & Member Relations (P&MR)	Kent J. Voorhees	Denise Creech	4414
Public Affairs & Public Relations (PA&PR)	Bonnie Charpentier	Glenn Ruskin	4477
Special			
Audits	Robert Soulen	Brian Bernstein	4415
Corporation Associates	Thomas H. Lane	Theresa L-Mutlu	4447
Executive Compensation	Bill Carroll	Claudette Simpson	4468
Governing Board for Publishing	Madeleine Jacobs	Marlyne Carr	2102
Governing Board for the GCI (GCI)	Madeleine Jacobs	Marlyne Carr	2102
Pension and Investments (P&I)	Paul Anderson	Ross Wilson	4416
Planning	Jim Burke	Robert Rich	6261
Other			
Board of Trustees, Group Insurance Plans (BOT)	Thomas H. Lane	Jean Parr	8911
Community Activities (CCA)	V. Michael Mautino	Latrease Garrison	6150
Chemists with Disabilities (CWD)	James Landis	William A. Scurry	6262
Clinical Chemistry	Kenneth Blick		
PRF Advisory Board	Edward J.J. Grabowski	Chris Hollinsed	4477

Landmarks - ad hoc	Paul Anderson	Judah Ginsberg	6274
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Liaisons involving SOCED 2007	
ConC to SOCED: Larry Krannich	SOCED to International Affairs: David Malik
CCA to SOCED: Ingrid Mones	SOCED to CCA: Andy Jorgensen
CEI to SOCED: Matt Fisher	SOCED to CEI: Alan Elzerman
CMA to SOCED: Allene Johnson	SOCED to CMA: Jeannette Brown
CPT to SOCED: Will Polik and Cindy Larive	SOCED to CPT: Bryan Balazs
GEAB to SOCED: Val Kuck	SOCED to GEAB: Thomas Smith
MAC to SOCED: Joe Heppert	SOCED to MAC: Royce Woosley
	SOCED to YCC: Mary Carroll

SOCED - Society Committee on Education

SOCED ensures that the American Chemical Society's educational activities focus on critical chemical education issues across all levels of instruction. SOCED periodically holds invitational conferences on issues of concern to the chemistry education community and to the ACS to help carry out its mandate. Participants in these conferences represent the highest levels of expertise on a given topic and help develop informed recommendations for possible approval by the Society's Board of Directors and implementation by SOCED. Previous SOCED conferences have led to the formulation of new policies and programs in chemical education within the ACS and have influenced the actions of individuals, other professional and scientific societies, government, and academic institutions. The most recent SOCED conference was "[Exploring the Molecular Vision](#)", held in June 2004.

SOCED must have between 12 and 20 members. SOCED currently consists of 16 members, 10 of whom must be ACS councilors. There are usually an additional 10 associates, and one or more consultants may also be appointed. The Committee Chair, who must be an ACS councilor, is appointed each year by the ACS President and Board Chair. The SOCED Chair may serve no more than three years in this capacity; members may serve up to three, three-year terms of continuous service on the Committee. Associate members are appointed annually for up to three years.

The Committee meets at both ACS national meetings, in subcommittee on the Thursday afternoon and evening prior to the national meeting, and in executive session all day the Friday before the national meeting. The SOCED open meeting is usually held on the following Monday afternoon. Various subcommittees and task forces of SOCED meet throughout the year, as the need arises. The SOCED Chair reports to the ACS Board of Directors at each Board meeting (four times a year), and to the ACS [Council](#) at each ACS national meeting. A summary of the most recent approved [minutes](#) of the Committee's meetings are available on the web at chemistry.org.

SOCED's responsibilities as defined in the bylaws include:

1. implementing ACS policies in chemical education;
2. developing reports and recommendations to the Board and Council on ACS policies related to chemical education and on ACS programs for the improvement of chemical education;
3. receiving, reviewing, and making recommendations to the Board and Council on proposals for policies and programs in chemical education;
4. acting in an advisory capacity on matters relating to chemical education; and
5. recommending approval or disapproval of requests for the funding of new or unbudgeted items related to chemical education.

SOCED is responsible for drafting the ACS science education policy document, *Science Education Policies for Sustainable Reform*. The Committee also drafts statements for Board approval on the annual budgets for both the National Science Foundation's education programs, and the U.S. Department of Education.

SOCED Member Roles and Responsibilities

Responsibilities of the Society Committee on Education Chair

- Review the charter of the Committee as described in the Bylaws for the Society Committee on Education.
- Review with the Staff Liaison the operations and structure of the committee, current and previous objectives.
- Appoint the chairs of the subcommittees. Appoint members of various task forces and advisory boards.
- Chair the meetings of the Committee at both ACS national meetings. Follow Robert's Rules of Order. Work with the Staff Liaison to develop the agenda for each meeting. Encourage the active participation of all members, especially new members and associates.
- In the case of sensitive discussions, the Chair should ask observers and/or guests to leave the meeting room. The Chair should clearly announce who is able to speak at each meeting, and who is able to vote.
- Report on ACS education programs to Council, ACS governance, members at large (C&EN), and the public.
- Recognize contributions and thank Committee members completing service. Work with the Staff Liaison and ConC to review the performance of members and associates.

Responsibilities of Society Committee on Education Members

- Attend all Committee meetings to represent the interests of the ACS membership as a **voting** member, in the design and execution of ACS education programs. Assist in the development of reports and recommendations to the Board and Council that help define the Society's policies on science education.
- Promote and encourage participation in ACS education programs.
- Attend SOCED and education programming at national meetings.
- Serve as a **voting** member of subcommittees, working groups, and task forces as needed.
- Advise SOCED Chair and ACS education staff of opportunities and challenges.

Responsibilities of Society Committee on Education Associates

- Attend all Committee meetings to represent the interests of the ACS membership as an **advisory** member, in the design and execution of ACS education programs. Assist in the development of reports and recommendations to the Board and Council that help define the Society's policies on science education.
- Promote and encourage participation in ACS education programs.
- Attend SOCED and education programming at national meetings.
- Serve as a **voting** member of subcommittees, working groups, and task forces as needed.
- Advise SOCED Chair and ACS education staff of opportunities and challenges.

Responsibilities of Society Committee on Education Consultants

- Attend all Committee meetings to represent the interests of the ACS membership as a **consultant** in the design and execution of ACS education programs. Assist in the development of reports and recommendations to the Board and Council that help define the Society's policies on science education.
- Promote and encourage participation in ACS education programs.
- Attend SOCED and education programming at national meetings.
- Serve as a **voting** member on subcommittees, working groups and task forces as needed.
- Advise SOCED Chair and ACS education staff of opportunities and challenges.

Role of Society Committee on Education Liaisons

- Enhance communication and flow of information between other committees and SOCED.
- Advise SOCED on key activities of the liaison's committee by addressing the full committee or through a written report.
- Relay relevant information from SOCED back to the liaison's committee, as appropriate.

SOCED Executive Committee, Subcommittees and Task Forces

The SOCED Executive Committee includes the Chair, Vice-chair, and Subcommittee A and B chairs. In addition, the Chair of SOCED may appoint others from the full committee to serve on the Executive Committee, typically one or two members chosen for their education policy expertise. These may be consultants or members from the full committee.

The Society Committee on Education is organized into four subcommittees and various task forces for the purpose of achieving its goals in the areas of programming and policy. The subcommittees are composed of members and associates of SOCED, while the task forces consist of members from SOCED and possibly other groups associated with the specified program. While the subcommittees are permanent, a task force generally exists for a fixed period of time.

Pre-College Subcommittee A – Commonly referred to as Sub A, this subcommittee reviews the activities of the Education Division Office of K-8 Science, Office of High School Science, and other programs dealing with early childhood through secondary education. At national meetings Sub A is typically given items from the full SOCED agenda dealing with K-12 issues to consider and report to the full Committee. This subcommittee meets at each ACS national meeting and has its own chair, appointed by the Chair of the full Committee.

Higher Education Subcommittee B – Commonly referred to as Sub B, this subcommittee reviews the activities of the Education Division Undergraduate Programs, College Programs, Technician Programs, and other programs dealing with undergraduate through post-college education. At national meetings Sub B is typically given items from the full SOCED agenda dealing with higher education issues to consider and report to the full Committee. This subcommittee meets at each ACS national meeting and has its own chair, appointed by the Chair of the full Committee.

U.S. National Chemistry Olympiad Subcommittee C – The U.S. National Chemistry Olympiad (USNCO) is a multi-tiered competition designed to stimulate and promote achievement in high school chemistry. Subcommittee C sets the policy, goals and the annual schedule for the USNCO. Two Subcommittee C task forces develop the exams used at the local and national level to select students for the national study camp training session at the U.S. Air Force Academy.

Chemical Technology Program Approval Service Subcommittee D – The ACS Chemical Technology Program Approval Service (CTPAS) was established to review, nurture, and approve two-year chemistry-based technology programs. Educational guidelines, reflecting the attributes of successful programs, are developed and administered by CTPAS members, who represent both academe and industry.

The Graduate Education Advisory Board (GEAB) was formed in 2000 under joint jurisdiction of SOCED and CPT to guide the development of the Office of Graduate Education. Since many Society-wide activities are germane to graduate education, one of the OGE's initial directives was to collect and disseminate information about these activities and to serve as a general clearinghouse of information on topics related to graduate education. More recently the Office of Graduate Education developed the popular Academic Employment Initiative, a poster session held during the ACS fall national meeting that provides a venue for candidates for academic positions to interact with recruiters in an informal setting.

Task Forces – Current Task Forces are

- Undergraduate Programming Task Force
- High School Programming Task Force
- Task Force on the ACS Guidelines for Chemistry Programs in Two-Year Colleges
- Task Force on the Guidelines and Recommendations for the Teaching of High School Chemistry

Expense Reimbursement Policy

Please note that this policy covers the full committee and its policy subcommittees ONLY (Subcommittees A and B). Since Subcommittees C and D are program subcommittees, which usually conduct their official business at an off site meeting, they are not covered by this policy.

	<u>Members/Associates/ Consultants Who Are Voting Councilors</u>	<u>Members/Associates/ Consultants Who Are Not Voting Councilors</u>
A. <u>Committee/Subcommittee Sessions at ACS National Meetings</u>		
Transportation	No*	Yes (actual cost)
Per diems: Committee executive session	**	**
(usually Friday)		
Per diems: Subcommittee meetings	**	**
(A and B only)		
Per diems: Committee open meeting	No.	No.
Per diems: Remainder of national meeting	No.	No.
National meeting registration fee.	No.	No.
B. <u>Committee Sessions Elsewhere</u>		
Transportation.	Yes.	Yes
Per diems	Yes.	Yes
C. <u>Subcommittee Sessions Elsewhere</u>		
Transportation.	Yes.	Yes
Per diems	Yes.	Yes

*For each national meeting, councilors can obtain \$767 of the cost of attending the meeting by submitting their vouchers to their participating local sections or divisions. These funds come from the Councilor Travel Reimbursement Fund.

**Since service on SOCED necessitates early arrival at the National Meeting (on Thursday), all members/associates/consultants will be entitled to claim two nights of hotel and three days of per diem with receipts up to a maximum not to exceed \$600 per meeting. Those who do not attend the subcommittee meeting will be entitled to one night of hotel and two days per diem for a maximum of \$400.

Note that participants in SOCED are provided with the following group meals: dinner on Thursday, continental breakfast on Friday, lunch on Friday, and dinner on Friday. If you choose NOT to eat with SOCED (e.g., on Friday evening) you must let us know 10 days or more in advance so that we can cancel your meal. Otherwise, you will NOT be separately reimbursed for other meal arrangements that you might have made for Friday evening.

Society Committee on Education Strategic Plan

The **Mission** of the American Chemical Society is to advance the broader chemistry enterprise and its practitioners for the benefit of Earth and its people.

*The 2004-2006 Strategic Plan of the American Chemical Society focused on commitments to our **Science**, our **Profession**, and the **Public**.*

The new "ACS Strategic Directions for 2007 and Beyond" plan was approved as a framework for the Society's programs and products. In 2007 SOCED will revise and update its current strategic plan to align and support the new ACS Strategic Directions.

The SOCED strategic plan defines its areas of interest and sets directions for the committee. This plan has typically been reviewed each year (1) to ensure that the SOCED plan is aligned with the current ACS Strategic Plan; (2) to assess progress toward previously identified objectives; and (3) to identify new directions and opportunities.

The **mission** of the Society Committee on Education, through its policies and procedures, is to:

- Support the development and implementation of ACS education programs that bring the wonder, excitement, opportunities, and challenges of modern chemical science to students and chemical professionals and allied scientists at all levels; and,
- Develop reports and recommendations to the Board and Council that help define the Society's policies on issues related to science education, especially chemical education, for the strategic development of current and future ACS educational activities, and the support of science education reform nationwide.

Since its establishment, SOCED has contributed to the development of Society policies on science education in general and chemistry education in particular through reports and recommendations to the Board of Directors and various Council committees. Recommendations have called for action from the Society itself, and/or have helped craft ACS policy positions on science education applicable to the actions of external bodies such as federal and state governments, local school systems, higher education institutions, and business and industry. Reports and recommendations have been developed through various mechanisms, including task forces, invitational conferences, and full and executive committee deliberations. One key example is the ACS White Paper on Education, *Science Education Policies for Sustainable Reform*.

The objectives identified by SOCED to achieve this mission in the 2004-2006 Strategic Plan are as follows:

Objective 1 Support national efforts to promote science education reform that reflects standards-based content, assessment, and instruction for all students at the K-12 level. The SOCED activities to help accomplish this objective are:

- Revise the SOCED White Paper on ACS educational policies every three years, and recommend new and amended policies as necessary, so that the ACS can respond to breaking issues in a timely fashion.
- Form alliances with other science/science education societies to promote these policies.
- Recommend areas for new ACS educational initiatives that advance the national policy agenda.
- Review and update, as appropriate, existing reports generated by SOCED on specific aspects of K-12 education, e.g., teacher preparation and continuing education. Widely publicize the availability of the new and/or revised reports.

Objective 2 Support national efforts to promote chemical education reform in higher education to ensure that it reflects the current practice and impact of our discipline and our current research-based knowledge of how students best learn chemistry and chemical engineering. The activities to help accomplish this objective are:

- Revise the SOCED White Paper on ACS educational policies every three years, and recommend new and amended policies as necessary, so that the ACS can respond to breaking issues in a timely fashion.
- Work closely with other ACS committees and other disciplinary societies to promote policies and programs that address educational issues related to the multidisciplinary nature of the practice of chemistry.
- Recommend areas for new ACS educational initiatives that advance national efforts to reform higher chemical education.
- Promote a national discussion on the issue of “reinventing chemistry education” as part of EMV.
- Review and update, as appropriate, existing reports generated by SOCED on specific aspects of higher education, e.g., two-year college chemistry. Widely publicize the availability of the revised reports.
- Continue to provide input into improving graduate education in cooperation with the Graduate Education Advisory Board.

Objective 3 Support efforts at all educational levels to bring about a more diverse workforce in the chemical sciences. The activities to help accomplish this objective are:

- Work in collaboration with other governance units, (in particular, the Committee on Minority Affairs, the Women Chemists Committee, the Committee on Chemists with Disabilities, Corporation Associates) to organize symposia/workshops/other activities to promote careers in the chemical sciences to underrepresented groups.
- Nominate chemists from underrepresented groups for membership on ACS governance committees and other ACS organizing groups including editorial boards.
- Provide input into the Enterprise 2015 report on the near future of chemistry being compiled by Bill Carroll.

The Division of Chemical Education vs the ACS Education Division

One of the abiding sources of confusion among educators, ACS members and sometimes even members of governance, is the difference between the Division of Chemical Education and the ACS Education Division.

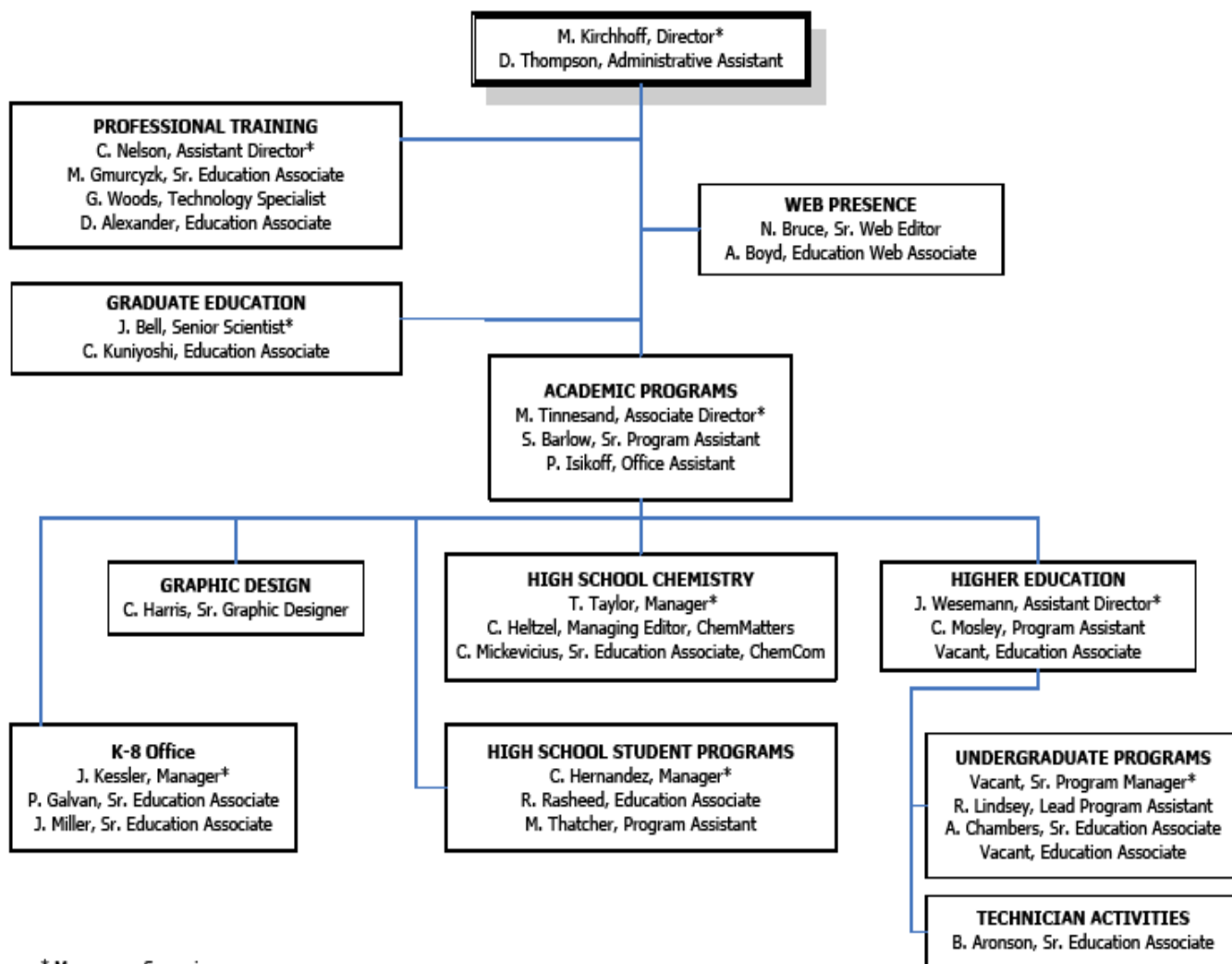
The Education Division is a staff unit of the ACS in Washington, D.C. There are some 30 staff members working in a half dozen units, mostly divided by the level of education (K-8, High School, etc.).

The Division of Chemical Education (CHED) is one of 33 specialty divisions of ACS membership. ACS members can elect to belong to as many of these specialty divisions as they wish. Each division has separate membership fees and separate programs and activities. Among the activities of the Division of Chemical Education is the CHED Program Committee, which is responsible for technical programming at the ACS National Meetings. Other activities include the ACS Examinations Institute, the publication of the *Journal of Chemical Education*, and participation in ACS regional meetings.

ACS Education Division Programs

The ACS Education Division has a wide range of programs and products, serving students from kindergarten through graduate school. For more information visit chemistry.org/education.

American Chemical Society Education Division Structure January 2007



Note that Project SEED reports to the Council Committee on Project SEED and the Office of Professional Training governance is the Committee on Professional Training. This chart shows the general organization by department, but does not necessarily reflect staff reporting relationships.

Academic Programs

The Academic Programs department includes all K-12, technician and Higher Education (undergraduate level, excluding the Office of Professional Training) programs. Academic programs support the production and distribution of the ACS Science Teaching Resources catalog. This catalog is distributed to teachers throughout the U.S. and supports our marketing of all ACS Education programs and products.

K to 8 Science

Inquiry in Action – Investigating Matter through Inquiry

A 248-page resource for teachers in grades 3-8, *Inquiry in Action* features seven activity-based investigations that emphasize the development in students of both science process skills and chemistry-related physical science content. *Inquiry in Action* is based on the National Science Education Standards for Inquiry and for Physical Science and covers physical properties, physical change, chemical change, states of matter, density, and mixtures and solutions. The book also includes student activity sheets, science background information for teachers, and assessment tools.

Inquiry Matters – Incorporating Inquiry into Elementary and Middle School Physical Science

A teacher professional development workshop for teachers in grades 3-8, *Inquiry Matters* is a half-day or full-day workshop conducted by K-8 staff that models an inquiry-based teaching approach using activities from the book *Inquiry in Action – Investigating Matter through Inquiry*. During the workshop, teachers conduct investigations they can do with their students, which build both physical science and inquiry knowledge and skill. Participating teachers receive the book, *Inquiry in Action* as part of the workshop.

Chemistry through Inquiry

A five-week online course developed by the K-8 Science Office in collaboration with the JASON Academy, a provider of online science education for elementary and middle school teachers. The course, which is instructed by ACS K-8 staff, takes teachers through investigations from the book, *Inquiry in Action – Investigating Matter through Inquiry*, while developing science content and inquiry-based teaching methods. The course features a very useful discussion board in which teachers can discuss and share their teaching experiences and how different aspects of the course relate to their particular teaching situations. Teachers have the option of receiving CEUs or graduate credit.

K-2 Science Activity Books

Two books for young children, *Apples, Bubbles, and Crystals – Your Science ABC's and Sunlight, Skyscrapers, and Soda-pop – The Wherever You Look Science Book*, encourage children to discover the wonders of science while strengthening reading skills. Fun-to-read poems are combined with fun-to-do hands-on science activities to create a resource for parents, teachers, and children. Short explanations of the science behind the activities are included.

The Best of WonderScience, Vol. 1 and 2

A two-volume compilation of 97 topics containing over 600 hands-on science activities for teachers and students in grades 3-6. Each topic consists of a set of activities that leads students from an introductory investigation through a series of activities that build toward a deeper understanding of the topic. The activities are linked to the National Science Education Standards.

WonderNet – Your Science Place in Cyberspace

An online resource of science activities based on topics from *The Best of WonderScience, Vol. 1 and 2*. Each new topic features three activities along with extensions and science explanations for students and adults. A special interactive “What’s Up?” section applies the science topic to a child’s everyday life. A new topic is added every other month and archived to create a comprehensive science activity resource that currently contains over 30 topics.

Re:Source Chemistry

An online resource of chemistry activities and information for teachers in grades 5-8. Resource Chemistry is based on the former NSF-funded teacher professional development project, Operation Chemistry, and includes activities and information from the modules The Language of Chemistry, Matter and Its Changes, Chemical Reactions, Acids & Bases, the Environment, and Density.

High School Chemistry

Project SEED

This 38-year old ACS program is designed to encourage economically disadvantaged high school students to realize their highest career potential. The ACS Committee on Project SEED provides oversight for the program, which enables students to work in chemistry research labs during a summer, guided by a scientist-mentor. Students who have successfully completed a first SEED summer are eligible for the Summer II program; all SEED high school graduates may apply for SEED college scholarships. Support for Project SEED also comes from an endowed fund.

Secondary Education Outreach

The High School budget also supports ACS education presentations and booths at the NSTA Regional Conventions, some ACS Regional meetings, ChemEd summer conferences, BCCE, and state science education meetings. We sponsor some of the activities for chemistry teachers for the Presidential Awards for Excellence in Science and Math Teaching (PAESMT) awards week celebration. The Office of High School Chemistry sponsors the chemistry awards annually for the International Science and Engineering Fair (ISEF). The office also coordinates with the local section to provide judges for the competition.

Chemistry Olympiads

The U.S. National Chemistry Olympiad (USNCO) program is a multi-tiered competition designed to stimulate and promote achievement in high school chemistry. Students who participate at their local section level can become eligible to sit for the national Olympiad examination, which leads to the selection of 20 students who attend a two-week study camp at the U.S. Air Force Academy. From these 20 students, the "final four" are selected to represent the United States at the International Chemistry Olympiad in July. Additional support for the USNCO also comes from an endowed fund for the Olympiad program, plus individual donations.

ChemMatters

This is a quarterly magazine for high school chemistry students that focuses on articles that reveal chemistry at work in everyday life to help students relate the concepts they learn in school to their daily lives. *ChemMatters* was designed for teachers to use as a supplement to their first-year high school chemistry course. A teacher's guide, available free online, provides additional information on articles, follow-up hands-on activities, classroom demonstrations, and additional resources.

Chemistry in the Community (ChemCom)

This high school chemistry textbook for college-bound students is published by W.H. Freeman and Company. The chemistry in *ChemCom* is organized around societal issues involving science and technology. Students learn more organic and biochemistry than in traditional courses, as well as some environmental and industrial chemistry. The course is very laboratory-based, and features decision-making activities, which give students practice in applying their chemistry knowledge in decision-making situations. This textbook clearly addresses the fundamental concepts and principles found in the *National Science Education Standards*. ACS also offers teacher-training workshops for those using, or interested in using, *ChemCom*.

Science in a Technical World (STW)

Science in a Technical World is a National Science Foundation-supported, tech prep program for students in grades 11 and 12. The 12 STW modules allow students to investigate industry-based problems that science technicians face in a typical workday. Each module consists of a print book for students and teachers, as well as an introductory video and multimedia CD-ROM. *Science in a Technical World* is published by W.H. Freeman and Company.

ACS High School Chemistry Clubs

In the fall of 2005, the Education Division of the ACS initiated a pilot program for launching ACS-sponsored high school chemistry clubs. The initial goal was to identify between 10 and 15 high school teachers willing to sponsor a High School Chemistry Club during the 2005-2006 pilot phase. The Office

of High School Chemistry is supporting the clubs with activities and materials on how to organize the students.

Higher Education

Student Affiliates (SA)

A program for undergraduates majoring in the chemical sciences that provides students with resources to enhance their education, develop their careers, and encourage them to see the benefit of a connection with their professional society. The Education Division magazine for Student Affiliates, *in Chemistry*, is mailed to students 4-5 times a year, and various career materials are provided to students as a benefit of membership. SA develops a program especially designed for undergraduates at national meetings; awards chapter grants for student chapters to organize regional meeting activities; and recognizes chapter activity annually in an awards program at the spring ACS national meeting.

Experiential Programs in Chemistry (EPiC)

The EPiC program provides information on the value of various outside-the-classroom activities for chemistry students—cooperative education, study abroad, internships, and service learning. Information packets are available, workshops and symposia are organized at meetings, and an annual Directory of Experiential Programs is sent to all SA Chapters and made available on the ACS Web.

Two-Year Colleges

This program focuses on two-year (community) college chemistry programs, such as the Chemical Technology Program Approval Service, Guidelines for Two-Year College Chemistry Programs, surveys and information for faculty, etc.

Technician Education

Programs that address the needs of the chemistry-based laboratory technician are the focus of this activity. Many of the current activities were sponsored by a grant from the National Science Foundation, principally, ChemTechLinks, the ACS clearinghouse to support and advance chemical technician education in the United States. The clearinghouse has information on chemical technician educational resources, career outreach materials, the ACS online skills standards database, and many other resources for chemistry-based technology programs.

Office of Graduate Education (OGE)

Collaborates with other Society offices to produce and coordinate programs and projects for graduate students, postdoctoral fellows, and beginning-career chemistry professionals, maintains a Web site, produces and disseminates a biannual *Newsletter*, and organizes meetings of the Advisory Board.

Graduate Education Advisory Board

Joint with the Committee on Professional Training, this board advises the OGE on issues of concern to graduate education.

Academic Employment Initiative (AEI)

The AEI assists graduate students, recent PhDs and post doctoral students seeking academic positions with their job search. A key activity for AEI is organizing poster sessions by the job seekers at the ACS Fall National Meeting SciMix event. During this poster session recruiters from colleges and universities can interview scores of candidates at a single event.

Preparing for Life After Graduate School (PfLAGS)

The PfLAGS project presents two-day workshops for graduate students that highlight what they need to know to prepare for careers after graduation, especially for nonacademic careers in business, industry, government, and so on. These workshops, carried out at university sites, also feature mock interviews and résumé reviews as a follow-up for interested students.

Master's Degree Registry

This online listing contains information about master's degree programs in chemistry and chemistry-related fields. Programs included are those that can be applied to and are not necessarily associated with a doctoral program.

College Curriculum Development

Chemistry: A Project of the American Chemical Society

The most recent textbook project of the ACS Education Division. Developed by a team of scientists and science educators, this book offers a nontraditional, activity-based approach to topics in general chemistry. The concepts in the textbook and accompanying laboratory program are those included in most general chemistry courses, but presented in a different order and context. The content emphasizes understanding principles in the context of biologically important molecules, beginning with water. Principles are introduced through classroom activities that are designed to start discussion among the students and instructor. Understanding and reasoning are stressed and the discussion is supported by models, computer-based materials, and web-based extensions to enhance visualization of important concepts. Published by W. H. Freeman & Co, 2005.

Chemistry in Context (CiC)

CiC is a college textbook for undergraduate non-science majors. Now in its fifth edition, over 500 colleges and universities have used it. The text introduces the phenomena and principles of chemistry within the context of socially significant issues such as global warming, ozone depletion, alternate energy sources, nutrition, and genetic engineering. The chemistry is presented as needed to inform an understanding of the central topics, and the text features student-centered activities designed to promote critical thinking and risk-benefit analysis as well as an understanding of chemical principles. An accompanying laboratory manual provides students an opportunity to examine chemical systems directly. Published by McGraw-Hill.

Green Chemistry

An ACS/EPA Cooperative Agreement enabled the development of a number of green chemistry educational materials, including a set of case studies, a laboratory manual, and an online annotated bibliography.

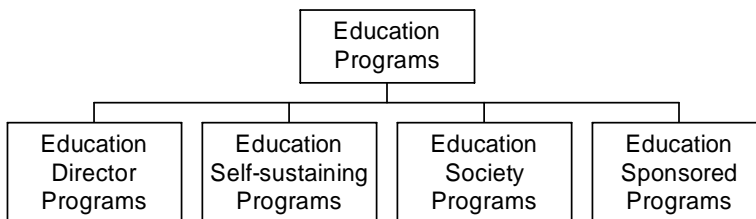
Office of Professional Training (OPT)

The Office of Professional Training works closely with the ACS Committee on Professional Training (CPT). CPT develops guidelines that define high-quality undergraduate chemistry programs and administers the ACS approval process for such programs. CPT produces several publications of interest to chemical educators, including the ACS *Directory of Graduate Research* (DGR), *Undergraduate Professional Education in Chemistry: Guidelines and Evaluation Procedures*, *Planning for Graduate Work in Chemistry*, and *Planning for a Career in Industry*. The *CPT Newsletter*, published twice a year, contains articles on policy issues related to ACS approval, reports of the results of special surveys on postsecondary education topics, and items on innovative courses and teaching methods.

Education Division Budgets

The ACS Education Division budgets are divided into four categories

ACS Education Budgets



Education Director Programs cover division administration and division-wide governance activities involving SOCED.

Education **Self-Sustaining Programs** consist of programs intended to be financially supported by revenue and income from the program activities. Examples include *ChemCom*, *Chemistry in Context*, *General Chemistry*, *STW*, Green Chemistry materials, and *DGR*.

Education **Society Programs** consist of programs supported by dues and ACS internal funding. These programs involve educational activities and services directed toward the elementary, secondary, and tertiary levels of instruction, and include the work of the Office of Professional Training. Examples include Technician Education, Student Affiliates, High School Chemistry, *ChemMatters*, K-8 Science, Two Year Colleges, and Kids & Chemistry.

Sponsored Education Programs include Project SEED and Olympiad endowments, as well as grants and awards from external sources, including the federal government, and private foundations. This schedule varies significantly from year-to-year, depending on the success of fund-raising efforts and grant applications. Other Sponsored programs include the National Science Digital Library and the Pan-American Advanced Studies Institute.

A History of the ACS Education Division

At the time of ACS's founding in 1876, chemical education bore little resemblance to the complex structures we know today. The objects of incorporation of the Society call for a role in the "diffusion of chemical knowledge". ACS's role in chemical education has been substantial and ongoing over the past century, but the history of the Education Division and SOCED is more recent.

A bold experiment

The Arthur D. Little *Report on the Structure, Governance, and Business Management of the American Chemical Society* was released in 1975. One recommendation was to reduce the number of governance committees in education: the Board-Council Committee on Professional Training (CPT), the Board Committee on Education and Students, and the Council Committee on Chemical Education. The three had overlapping portfolios. Additional concerns related to the specific roles of the member Division of Chemical Education, Inc. (CHED), and the staff Department of Educational Activities (then part of the Membership Division).

In 1977 the Council and the Board took action. In 1978, as a three-year experiment, ACS suspended the activities of the Board and Council committees and established an Education Commission (EdCom) under the chairmanship of Peter Yankwich, then at the University of Illinois. EdCom's membership included representation from all cognizant committees and CHED. The experiment was so successful in resolving internal conflicts that, in 1981, when the experimental period ended, ACS established the Society Committee on Education (SOCED) to replace EdCom. CPT, which had continued to operate independently of EdCom, retained its identity as a freestanding Board-Council committee. Unlike EdCom, which had representative membership, SOCED has 12-20 members, two-thirds of whom (including the chair) must be ACS councilors.

SOCED Leadership 1978-Present

	Chair	Subcommittee A Chair	Subcommittee B Chair
1978	Peter Yankwich (EdCom) University of Illinois		
1979	Peter Yankwich (EdCom) University of Illinois	Glenn Crosby Washington State University	Derek Davenport Purdue University
1980	Peter Yankwich (EdCom) University of Illinois	Glenn Crosby Washington State University	Derek Davenport Purdue University
1981	Stanley Kirschner Wayne State University	Glenn Crosby Washington State University	Derek Davenport Purdue University
1982	Stanley Kirschner Wayne State University	Glenn Crosby Washington State University	Derek Davenport Purdue University
1983	Stanley Kirschner Wayne State University	Glenn Crosby Washington State University	Alan Clifford Virginia Polytech University
1984	Stanley Kirschner Wayne State University	Glenn Crosby Washington State University	Ron Archer Univ of Massachusetts
1985	Alan L McClelland Dupont	Glenn Crosby Washington State University	Ron Archer Univ of Massachusetts
1986	Alan L McClelland Dupont	Glenn Crosby Washington State University	Ron Archer Univ of Massachusetts
1987	Ron Archer Univ of Massachusetts	Glenn Crosby Washington State University	Don Jones Western Maryland
1988	Ron Archer Univ of Massachusetts	John Moore Eastern Michigan	Don Jones Western Maryland
1989	Ron Archer Univ of Massachusetts	John Moore Eastern Michigan	Don Jones Western Maryland

1990	Glenn Crosby Washington State University	John Moore University of Wisconsin	Uni Susskind Oakland (MI) Comm Col
1991	Glenn Crosby Washington State University	John Moore University of Wisconsin	Uni Susskind Oakland (MI) Comm Col
1992	Ivan Legg Auburn University	John Moore University of Wisconsin	Uni Susskind Oakland (MI) Comm Col
1993	Ivan Legg Memphis State University	Frank Cardulla Niles North High School	Truman Schwartz Macalester College
1994	Ivan Legg Memphis State University	Frank Cardulla Niles North High School	David Lavallee Hunter College
1995	Stanley Pine California State-LA	Frank Cardulla Niles North High School	David Lavallee Hunter College
1996	Stanley Pine California State-LA	Frank Cardulla Niles North High School	David Lavallee Hunter College
1997	Stanley Pine California State-LA	Frank Cardulla Niles North High School	David Lavallee Hunter College
1998	Don Jones NSF Washington D.C	Frank Cardulla Niles North High School	David Lavallee Hunter College
1999	Don Jones NSF Washington D.C	Frank Cardulla Niles North High School	David Lavallee Hunter College
2000	Don Jones NSF Washington D.C.	George Palladino University of Pennsylvania	David Malik IUPUI
2001	Daryle Busch University of Kansas	George Palladino University of Pennsylvania	David Malik IUPUI
2002	Daryle Busch University of Kansas	George Palladino University of Pennsylvania	David Malik IUPUI
2003	Daryle Busch University of Kansas	George Palladino University of Pennsylvania	David Malik IUPUI
2004	Joseph Heppert University of Kansas	Bryan Balazs Livermore National Lab	Maureen Scharberg San Jose State University
2005	Joseph Heppert University of Kansas	Bryan Balazs Livermore National Lab	Maureen Scharberg San Jose State University
2006	Joseph Heppert University of Kansas	Bryan Balazs Livermore National Lab	Maureen Scharberg San Jose State University
2007	Bryan Balazs Livermore National Lab	Barbara Sitzman LA Unified Schools (CA)	Mary Carroll Union College (NY)

SOCED activities

During the past 30 years, the number and range of ACS educational programs under the aegis of SOCED have grown significantly. This growth has occurred during a period of broad national efforts to reform science, mathematics, and technology education, with emphasis on expanding the audience for science knowledge at all levels of education. In 1989 the American Association for the Advancement of Science (AAAS), as part of Project 2061, published *Science for All Americans*. However "chemistry for all" is a concern that predated the AAAS project by some 10 years. In October 1978 ACS President Anna Harrison held an invitational conference on "Chemistry for the Public" to establish ACS's role in promoting chemistry education for the "general student", who was defined as "the student who does not expect to need technical competence in science for career purposes". The conference recommendations included support for

- the development of science programs for the very young, including preschool children;

- extended interaction between ACS and the high school community, including the establishment of professional development programs for high school teachers; and
- the production of curricular materials for the general student from middle school through adult education.

This conference was followed by a series of invitational conferences organized by SOCED. They produced recommendations to the ACS Board of Directors for the establishment of ACS policies and specific programs and resources addressing needs at all educational levels. These conferences covered a broad range of topics, including

- the cross-fertilization of chemistry and chemical engineering curricula (1980);
- chemistry in the K-9 curricula (1982);
- the content of undergraduate physical chemistry courses (1984);
- critical issues in two-year college chemistry (1985)
- the high school-college interface, with an emphasis on the curriculum (1988);
- implementation of recommendations from previous SOCED conferences (1992);
- articulation issues involving two and four-year undergraduate programs (1995);
- graduate education (1999);
- Exploring the Molecular Vision (2001); and
- Critical Issues and Best Practices in Chemical Lab-Technician Education (2004)

Program growth in the Department of Educational Activities (later the Education Division) has resulted from both the implementation of conference recommendations and the work of numerous SOCED task forces that have come and gone over the past 20 years.

Of particular importance was the SOCED Task Force on the Study of Chemistry Education in the United States, established by then SOCED chair Stanley Kirschner in January 1983. This task force, chaired by Yankwich, produced the seminal *Tomorrow* report (1984) on the status of chemistry nationally, which summarized recommendations for action by ACS, other societies, the chemical industry, and state and local governments. The report was widely circulated to everyone who had a stake in improving the quality of chemistry education nationally and was used within ACS to support efforts to expand Education Division programs. The *Tomorrow* report contained recommendations for action nationwide on elementary school science, high school chemistry and other sciences, two-year college chemistry and chemical technology, university and college chemistry and science, careers in chemistry, and industry and education.

In recent years SOCED has produced a series of white papers that summarize the chemistry and science education policies that the Society will support and promote. *Education Policies for National Survival* (1989, 1991) was replaced by *Science Education Policies for Sustainable Reform* (1997, 2001, 2004). These documents were drafted by SOCED task forces and sent to the Board Committee on Public Affairs and Public Relations and then to the Board of Directors for acceptance as ACS policy statements. The *Science Education Policies for Sustainable Reform* paper has been especially useful to the ACS Office of Legislative and Government

Affairs staff that work with Congress and state legislatures on science education issues.

Staff programming

In 1982 the Department of Educational Activities became an ACS division under the leadership of **Moses Passer** (until 1986) then **Sylvia Ware** (1987 to 2005) and currently **Mary Kirchhoff** (2006- present). As a division, it gave greater visibility and higher status to education programming within the Society. The pace at which programs began to grow in the new division accelerated.

At the beginning of the Society's second century, in 1977, the educational programs administered by professional staff included the approval program of the CPT, Project SEED (Summer Educational Experience for Economically Disadvantaged), Student Affiliates, Technician Activities, Continuing Education, and Career Services. Thirty years later the programs of the Education Division cover all levels of education from preschool to graduate school. They address the needs of the student intending to pursue a science career as well as the general student identified in Harrison's report to EdCom in 1978. The vision of a comprehensive educational program, as described in the *Tomorrow* report and in reports from the various SOCED invitational conferences, has become a reality.

The ACS Board of Directors took major steps in 1977-78 to promote educational activities in the Society. The Board gave a grant to CHED to support the addition of a high school component to the *Journal of Chemical Education* and approved staffing for an Office of High School Chemistry within the Department of Educational Activities. By February 1979 staff had been hired and began developing programs of interest to high school teachers. This work represented collaboration not only between EdCom and later SOCED but also between the Office of High School Chemistry staff and the High School Chemistry Committee of CHED under the leadership of James DeRose. In fact, programs in the Education Division have grown with the active participation and leadership of many members of CHED, particularly during the past 20 years.

When the new Office of High School Chemistry was established, one of the first actions was to survey high school teachers who were ACS members to determine what services and programs they wanted. From this survey, the seeds of the new initiative grew. The office began to publish *Chemunity*, a newsletter for high school teachers, and arranged a series of demonstration workshops that were held across the nation. The Expert Demonstrator Training Activity (the EDTA program), which was led by Bassam Shakhshiri of the University of Wisconsin, proved to be an immediate success. Together with CHED, programs for high school teachers were put in place at national and regional meetings, with the teachers paying a special lower rate to attend. In 2006 the Task Force for High School Day Programming was established to help with the activities during the high school program. Efforts were made to encourage interaction among high school teachers and ACS local sections through the promotion of Teacher Affiliate Groups aligned with local sections.

Late in 1981 ACS received the first in a series of grants from the National Science Foundation (NSF) to support the development of a new chemistry course for the general student at the high school level. Thomas W. Lippincott, then at the University of Arizona, was the principal investigator for the first edition of the *Chemistry in the Community (ChemCom)* text; Anna Harrison chaired the Steering Committee; Henry Heikkinen, then at the University of Maryland, was chief editor; Dwaine Eubanks, then at Oklahoma State University, was field test director; and Sylvia Ware was project manager. Considered a cutting-edge course 20 years ago,

ChemCom, now in its fifth edition, continues to include the most promising practices in teaching science as identified by research in chemical education.

ChemCom has pioneered a new way to teach high school chemistry by introducing chemistry from a societal context. The term "teaching chemistry on a need-to-know basis" originated with *ChemCom*. In 1997 the quality of the program was recognized by the publication of a history of *ChemCom* in an Organization for Economic Cooperation and Development (OECD) study of innovations in mathematics, science, and technology education. *ChemCom* was the only secondary school chemistry course so recognized, and it has been translated into Russian, Japanese, and Spanish. The publication of *ChemCom* led to the development of other chemistry and science courses that shared a similar approach to teaching, notably a science/technology/society emphasis and a focus on inquiry-based instruction. For college nonscience majors, ACS developed *Chemistry in Context*; for 6th-, 7th-, and 8th grade students, there is *FACETS (Foundations and Challenges to Encourage Technology-based Science)*; and for secondary school students in technical education, *Science in a Technical World (STW)*, a two-year modular program that focuses on the work of technicians in various industries. In addition to student and annotated teacher units (12 of each), *STW* includes 12 videos and 12 interactive CD-ROMs that simulate the work of technicians in the 12 industries featured. One of the most recent curriculum projects is an undergraduate text for science majors titled *Chemistry*. This text is organized around a series of activities and strategies that call for a very interactive style of teaching, a relatively uncommon approach to teaching at the college level. The Division also developed a number of instructional materials in green chemistry for high school, undergraduate, and graduate students.

Also during the past 30 years, ACS published a magazine for elementary school students, *WonderScience* (now only available as the two-volume set, *The Best of WonderScience*); *ChemMatters*, a magazine for high school students; and *in Chemistry*, a magazine for undergraduate ACS student affiliates. There are also two activity books for first-time readers. With the changing times, the emphasis on production of educational materials is shifting from paper to the web. In 2006 a Society-wide effort to reinvent the ACS web presence was initiated, with work continuing over three years. In 2006 the Education Division was part of an NSF award to develop a National Science Digital Library Pathway in Chemistry.

In addition to the growth in materials development, the past 30 years have seen increased emphasis on professional development at all levels. The NSF-funded Operation Chemistry program developed materials and held workshops to train teachers in grades 4-8 in ways to introduce chemistry concepts into middle school general science programs, using a "train-the trainers" model. This same model of using expert teachers to work on professional development activities for their peers has been used for *ChemCom*, *Chemistry*, *Chemistry in Context*, *FACETS*, and *STW*. The success of these programs, especially *ChemCom*, has very much depended on the extensive professional development workshops with teachers offered by the Society.

Although it is now administratively in a separate division, Continuing Education for professional chemists was a major focus of the Education Division over the past 35 years. The program began at the Detroit national meeting in 1965 with the first short course on Interpretation of Infrared Spectra, attended by 55 people. The Short Courses program has enjoyed steady growth and now includes more than 200 sessions attended by almost 5000 scientists every year. In addition, the Society has vigorously experimented with a wide variety of distance education methods to increase the scope of the audience for continuing education.

The traditional two-to-five-day public sessions of short courses are still popular, as are in-house short courses provided to individual companies on demand. The Short Courses program has served primarily industrial chemists and technicians, with a small percentage of participants coming from academe and government.

Courses on synthetic organic chemistry, surface chemistry, gas chromatography, mass spectrometry, polymer chemistry, chemical engineering fundamentals, and high-performance liquid chromatography have always been well attended. The development of new technologies in pharmaceutical research, such as combinatorial chemistry and molecular modeling, has provided fertile opportunities for new courses to serve researchers who use these techniques. Courses are now being offered in antibiotics, combinatorial chemistry, organic chemistry of drug design, formulation development of protein and peptide drug products, computational chemistry, and computer-assisted drug design. For the immediate future, the focus of the program will shift increasingly to this market sector.

In distance education, ACS has diligently experimented with using different delivery systems, including computer-based instruction; correspondence, film and audio and video courses; and satellite television

Each program has enjoyed some degree of popularity. For example, thousands of audio and videotapes were distributed on subjects ranging from atomic absorption to safety to X-ray diffraction, and thousands of scientists and students participated in live satellite television broadcasts of presentations from noted chemists, including several Nobel laureates. However, because the high cost of developing courses in these media was never offset by the revenues they generated, each was eventually abandoned. Over the past five years, Continuing Education has developed a catalog of web-based courses, offered as both live webcasts and asynchronous learning opportunities. At present, the Continuing Education program is part of the Society's new business development unit under the Treasurer's office. It was combined with the ACS Prospectives Conferences in 2005.

The past 30 years have seen a healthy growth in programs for different groups of students. Founded in 1968 as one of several social action projects of the ACS, Project SEED places economically disadvantaged high school students in a chemistry research laboratory for a summer learning experience. By the 1980's it was a struggling program. By the turn of the millennium however, Project SEED had become a one or two-summer growth opportunity for more than 400 students each summer. Of these students, each year some 60-70% are female and 80-90% are from an underrepresented minority group. Project SEED now also offers some 30 college scholarships a year to former SEED students. Also remarkable is that Project SEED, a program in great financial difficulty in 1982, now has an endowment of over \$5 million.

The Chemistry Olympiad, a program intended to identify the best and brightest of our high school chemistry students through outreach activities involving ACS local sections, was initiated in 1984. High school students identified by local sections take a national Chemistry Olympiad examination developed for the program in association with the ACS Examinations Institute. The top 20 students attend a 10-day training camp at the U.S. Air Force Academy, where the top four students are selected to represent the United States at the International Chemistry Olympiad. In 1992, the International Olympiad was held in the United States for the first time, under the aegis of ACS. The Pittsburgh Local Section played a major role in hosting the competition.

The Student Affiliates program for undergraduates was begun in 1937 and is still successful today. In recent years the program has attracted large numbers of student affiliates to ACS national and regional meetings. In the early 1990s a SOCED task force was appointed to organize a special three to four-day program for student affiliates at both ACS national meetings. The program now includes career-related symposia and workshops; a research poster session, which may have as many as 1000 papers; an eminent chemist's lecture; a chapter awards ceremony; a graduate school fair; and numerous social events. Typically, the program attracts some 1500 students at the spring national meeting and 500 at the fall meeting.

Another new Student Affiliates activity is the Community Interaction-Student Affiliates (CISA) award program, which annually distributes 15-18 small grants to Student Affiliate chapters to support career outreach to pre-college minority students. The Student Affiliates program also provides Innovative Activities grants to support creative programming of chapters at the local level. Finally, the program strongly promotes experiential learning, including internships, study abroad, and service learning.

For 18 months during 1993-94, ACS participated in a partnership with *USA Today* to bring science activities to its readership. Every other Tuesday, ACS staff wrote a half-page column of science activities and information for children and the adults in their lives. The newspaper featured a "hard science" story on the other half of the page. Readers could write to ACS for small science kits, copies of *WonderScience* magazine, and career and science information. More than 17,000 requests were received, including many from proud grandparents working with future Nobel laureates! Readers could also participate in a program of competitive grants, Parents and Children for Terrific Science (PACTS), to run science workshops for children and adults in their communities. The ongoing Kids & Chemistry program trains chemists, other scientists, and college students to promote hands-on science in elementary school classrooms. The experiments are tied directly to the National Science Education Standards and the individual school science curriculum. They introduce students to chemistry and the work of chemists in a very lively fashion.

Since 1976 the ACS Technicians program has grown steadily. Catalyzed by the SOCED invitational conferences mentioned earlier, the Chemical Technology Program Approval Service (CTPAS) was established in 1990. This service approves two-year chemical technology programs using ACS guidelines for laboratory technician programs. The current guidelines are supported by a set of voluntary industry standards for all chemical-based technicians in the chemical process industries. ACS has also been involved in establishing and promoting local alliances between industries and two-year colleges to improve the quality of the technical workforce at the local level. Most recently, ACS was established as a clearinghouse for chemical lab technician education through a series of NSF-supported Advanced Technological Education (ATE) grants.

Funding the growth in educational programming

Over the past 20 years in particular, the Education Division has made a concerted effort to raise funds for program development from groups external to ACS, including federal government agencies, private foundations, and business and industry. This effort has been so successful that, since 1981, the division has received funding from the NSF Education and Human Resources Directorate of slightly more than \$11 million. During the same period, an additional \$2.4 million was received in competitive grant awards from the Department of Education, the Department of Energy, the Environmental Protection Agency, the National Air and Space Administration, and the National Skill Standards Board.

Federal funding paid for the development of *ChemCom*, *FACETS*, *STW*, and the "Doing Chemistry" videodiscs. These funds have subsidized the International Chemistry Olympiad in the United States, provided stipends for Project SEED students and supported professional development for teachers through both *ChemCom* and Operation Chemistry. The voluntary industry standards for technicians in the chemical process industries were developed with government monies, as were efforts to promote alliance building between industry and academia in support of technician education. Of the more than \$13 million received from the federal government since 1981, \$5.3 million went to support educational materials development, \$3.9 million to professional development, \$1.04 million to student programs, and \$2.7 million to support chemistry institutions, both in academe and industry.

In addition to government funding, significant contributions were received from individuals, business and industry, and private foundations as part of the ACS fund-raising Campaign for Chemistry. Between 1986 and 1991 the campaign raised some \$7.2 million for its "Chemistry Education for Life" component of the campaign. These funds supported *ChemCom* teacher workshops, the development of the *Chemistry in Context* textbook, the distribution of *WonderScience* magazine, the International Chemistry Olympiad, and the *USA Today* inserts. In addition, the campaign provided the initial funds to establish two endowed programs, one for Project SEED and one for the Chemistry Olympiad. Other individuals and companies have also donated to these programs, providing an additional sum of about \$3 million. Thus, over the past 20 years, nearly \$24 million in external funds, obtained mostly via competitive grants, has gone into the development of programs in the Education Division.

The Committee on Professional Training

The ACS Council established CPT in 1936 to develop guidelines for the education of professional chemists. This action was taken in response to serious concerns raised by industrial employers that the credential of a bachelor's degree in chemistry did not represent a predictable knowledge base or set of laboratory skills. The guidelines, first published in *Chemical & Engineering News* in 1939, were adopted by the Council in 1940. Since then, they have been the basis for the ongoing evaluation of undergraduate chemistry programs in colleges and universities across the United States. During the past 25+ years, the number of approved schools has grown from 514 to 639 (as of January 2007).

ACS guidelines have been updated periodically over the years, most recently in 2003. However, the central elements of those original standards still form the basis of the evaluation policies and procedures described in the most recent publication of *Undergraduate Professional Education in Chemistry: Guidelines and Evaluation Procedures* (2003). Naturally, the guidelines address the content of the chemistry curriculum; but equally important are the faculty, facilities, laboratory instrumentation, library resources, and funding available to support the undergraduate program.

The guidelines have always provided only general advice on the curriculum required for ACS approval, leaving the details of course content and structure to the departments. However, many chemistry departments, especially those seeking to gain approval for the first time, have requested more specific advice on the range and level of topics that should be taught in the core curriculum. Thus, in 1983, CPT developed a set of topical supplements to the guidelines with the assistance of the relevant ACS technical divisions.

These supplements are reviewed and updated regularly to ensure that they keep pace with the rapid advances in chemistry.

Research has long been a hallmark of excellence in undergraduate chemistry programs, and this valuable component of a student's education has assumed an increasingly prominent role during the past 30 years. The current ACS guidelines describe the expectations for a successful undergraduate research program and the institutional commitment necessary to conduct research at this level. As the practice of chemistry became increasingly interdisciplinary, CPT responded by developing guidelines for the approval of options in closely related fields of study. The first requirements for approved options in biochemistry, chemistry education, and polymers were published in 1988. Since then, ACS has published guidelines for approval in materials science, chemical physics, and environmental chemistry. In 1998 CPT embarked on a review of the success of each option, with the goal of determining the course of the option approval process. Clearly, the biochemistry and environmental options have been the most popular and appear to serve a useful function for those schools that have sought program approval. The polymers option provides ACS recognition of those departments that have the specialized faculty and facilities needed to offer a modern course of undergraduate study in this area. The chemistry education option has been identified as needing further development or substantial revision in order to offer useful guidance on the education of the next generation of high school chemistry teachers.

Over the past 30 years, CPT members have become increasingly aware of the need to share ideas, trends, and data with a broader academic population than just the chemistry department chairs and heads at ACS-approved schools. Accordingly, in spring 1985, the first CPT newsletter was published and distributed to all chemistry faculty members involved in ACS-approved programs. Over time, the newsletter has developed into a biannual publication containing articles on emerging issues of importance to the academic chemistry community and reports on the policy changes under consideration by CPT. The CPT website was launched in August 1996 and has grown to become a valued repository of all CPT documents. In the 1990s CPT organized symposia at various national meetings to inform chemistry faculty and involve them in the continuing process of refining the guidelines. One of the goals of the approval program is to collect and make available information on trends and developments in modern chemical education. The annual report of chemistry and chemical engineering degrees granted by ACS approved chemistry programs and engineering programs accredited by the Accreditation Board for Engineering and Technology offers the opportunity for long-term analysis of the productivity of chemical education in the United States. The newly implemented electronic system for collecting annual report data will allow more rapid dissemination of this information than in the past and more complete analysis of all of the data collected through these reports. The surveys conducted by CPT since the mid-1970s include an assessment of the early use of computers in chemistry programs, faculty mobility from industry to academe, a multiyear study of enrollments in chemistry courses, and construction and renovation of chemistry and science buildings. Historically, CPT performed detailed surveys of graduate education every decade from 1940 to 1980. In the 1990s CPT resumed this activity and has published four reports on various aspects of master's and doctoral education.

The biennial publication of the *Directory of Graduate Research (DGR)* began in 1953. Since then, the *DGR* has grown to include Canadian universities and programs in chemical engineering, biochemistry, and nine other disciplines with a solid chemistry base. In 1984 the *DGR* was released through an external vendor

as a searchable database. However, because the database was not widely used, it was discontinued in 1987. In 1997 the searchable database format was revamped with the assistance of the ACS Publications Division and released as an electronic product. In 2006 DGRweb was revised and updated, recreating a new release that was offered free of charge for the first time.

Among the current challenges for the ACS approval program and the quality of chemical education are the increasing reliance on part-time faculty and the evolution of access to the chemical literature. The 1999 ACS guidelines specifically address the role of part-time faculty and the importance of their integration into the full range of departmental activities, including professional development opportunities. In 2000 CPT surveyed the approved schools to define more contemporary guidelines for library resources and to assess student usage of chemical literature.

The approval program was designed to be, and has remained, an entirely voluntary effort, with all cost borne by the Society. The international academic community recognizes the program as a valuable model for defining educational standards and evaluating compliance with those standards. The impact of the approval program is reflected in the strong position that chemistry departments typically hold within their colleges or universities relative to other science programs and in the consistency of the preparation received by ACS-certified chemistry graduates as they advance in graduate school or in professional employment as chemists.

Graduate Education

In 2000 the ACS established an Office of Graduate Education (OGE) within the Division of Education. The Graduate Education Advisory Board (GEAB) was formed under joint jurisdiction of SOCED and CPT to guide the development of the office. Since many Society-wide activities are germane to graduate education, one of the OGE's initial directives was to collect and disseminate information about these activities and to serve as a general clearinghouse of information on topics related to graduate education. More recently the Office of Graduate Education developed the popular Academic Employment Initiative, a poster session held during the ACS fall national meeting that provides a venue for candidates for academic positions to interact with recruiters in an informal setting.

ACS Acronyms

ACS – General	ACS – Education
<p>ACS American Chemical Society ATE Advanced Technological Education (A program of the National Science Foundation) C&EN Chemical and Engineering News CAS Chemical Abstracts Service CCED Chemists Celebrate Earth Day CIL Chemists in the Library ED Education Division GCI Green Chemistry Institute IChC International Chemistry Celebrations NCW National Chemistry Week NSF National Science Foundation PRF Petroleum Research Fund TAGs Technician Affiliate Groups 2YC3 Two-Year College Chemistry Conferences</p>	<p>AEI Academic Employment Initiative BCCE Biennial Conference on Chemical Education CEU Continuing Education Unit CHED Division of Chemical Education ChemCom .. Chemistry in the Community, ACS high school textbook. ChemEd A summer chemical education conference which is held every other year. CPT Committee on Professional Training CTL ChemTechLinks-Technician clearinghouse CTPAS Chemical Technology Program Approval Service DGR Directory of Graduate Research DivCHED Division of Chemical Education GEAB Graduate Education Advisory Board ICCE International Conference on Chemical Education IChO International Chemistry Olympiad <i>J.ChemEd</i> .. The Journal of Chemical Education K-12 Kindergarten through 12th grade NRC National Research Council NSES National Science Education Standards NSTA National Science Teachers Association OGE Office of Graduate Education OLGA Office of Legislative and Government Affairs OPT Office of Professional Training POLY-ED ... Education committee of the ACS Division of Polymer Chemistry SAACS Student Affiliates of the ACS SEED (Project SEED) ACS programs for economically disadvantaged students. USNCO U.S. National Chemistry Olympiad</p>

ACS – Committees	ACS – Divisions
<p>B&F Budget and Finance Committee CA Corporation Associates CAS Chemical Abstracts Advisory Board C&B Constitution and Bylaws CCA Committee on Community Activities CCPA..... Chemistry and Public Affairs CCPR..... Council Committee on Public Relations CCS Committee on Chemical Safety CEI..... Committee on Environmental Improvement CEPA Committee on Economic and Professional Affairs CHAS Chemical Health and Safety CMA..... Committee on Minority Affairs COMSCI .. Committee on Science CONC Committee on Committees CPC Council Policy Committee CPRC..... Committee on Public Relations and Communications CPT..... Committee on Professional Training CTA..... Committee on Technician Affairs CWD Committee on Chemists with Disabilities DAC Divisional Activities Committee G&A Committee on Grants & Awards IAC..... International Activities Committee LSAC Committee on Local Section Activities M&E Meetings and Expositions Committee MAC Membership Affairs Committee N&E Nominations and Electronics Committee P&MR Professional and Member Relations PA&PR..... Committee on Public Affairs and Public Relations SOCED Society Committee on Education WCC Women Chemist Committee YCC Younger Chemists Committee</p>	<p>AGFD..... Agricultural & Food Chemistry AGRO Agrochemicals ANAL Analytical Chemistry BIOT BioChemical Technology BIOL Biological Chemistry BMGT Business Development & Management CARB..... Carbohydrate Chemistry CELL..... Cellulose, Paper, & Textile CHED Chemical Education CHAL Chemistry & The Law CHAS..... Chemical Health & Safety CINF Chemical Information COLL Colloid & Surface Chemistry COMP Computers in Chemistry ENVR..... Environmental Chemistry FERT Fertilizer & Soil Chemistry FLUO Fluorine Chemistry FUEL Fuel Chemistry GEO..... Geochemistry HIST History of Chemistry I&EC Industrial & Engineering Chemistry INOR..... Inorganic MEDI..... Medicinal Chemistry NUCL..... Nuclear Chemistry & Technology ORG Organic Chemistry PETR Petroleum Chemistry PHYS..... Physical Chemistry POLY Polymer Chemistry PMSE Polymeric Materials: Science & Engineering PROF..... Professional Relations RUBB..... Rubber SMCB Small Chemical Businesses TECH..... Chemical Technicians TOXI..... Chemical Toxicology</p>

Future ACS National Meetings

<ul style="list-style-type: none">• 234th - ACS National Meeting & Exposition August 19-23, 2007, Boston, MA• 235th - ACS National Meeting & Exposition April 6-10, 2008, New Orleans, LA• 236th - ACS National Meeting & Exposition August 17-21, 2008, Philadelphia, PA• 237th - ACS National Meeting & Exposition March 22-26, 2009, Salt Lake City, UT• 238th - ACS National Meeting & Exposition August 16-20, 2009, Washington, DC• 239th - ACS National Meeting & Exposition March 21-25, 2010, San Francisco, CA• 240th - ACS National Meeting & Exposition August 22-26, 2010, Boston, MA• 241st - ACS National Meeting & Exposition March 27-31, 2011, Anaheim, CA	<ul style="list-style-type: none">• 242nd - ACS National Meeting & Exposition August 28 - September 1, 2011, Chicago, IL• 243rd - ACS National Meeting & Exposition March 25-29, 2012, San Diego, CA• 244th - ACS National Meeting & Exposition September 9-13, 2012, New York, NY• 245th - ACS National Meeting & Exposition April 7-11, 2013, New Orleans, LA• 246th - ACS National Meeting & Exposition September 8-12, 2013, Indianapolis, IN• 247th - ACS National Meeting & Exposition March 16-20, 2014, Washington, DC *• 248th - ACS National Meeting & Exposition September 7-11, 2014, San Francisco, CA *
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Listed here are some staff members who can help you with product information or update you on the Division's varied projects in support of science education.

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