GSA ANNUAL MEETING & EXPOSITION ISSUE

GSA TODAY

VOL. 16, No. 6 A PUBLICATION OF THE GEOLOGICAL SOCIETY OF AMERICA JUNE 2006

Philadelphia 2006:

The Pursuit of Science

Building on a Foundation of Discovery

Inside:

New!

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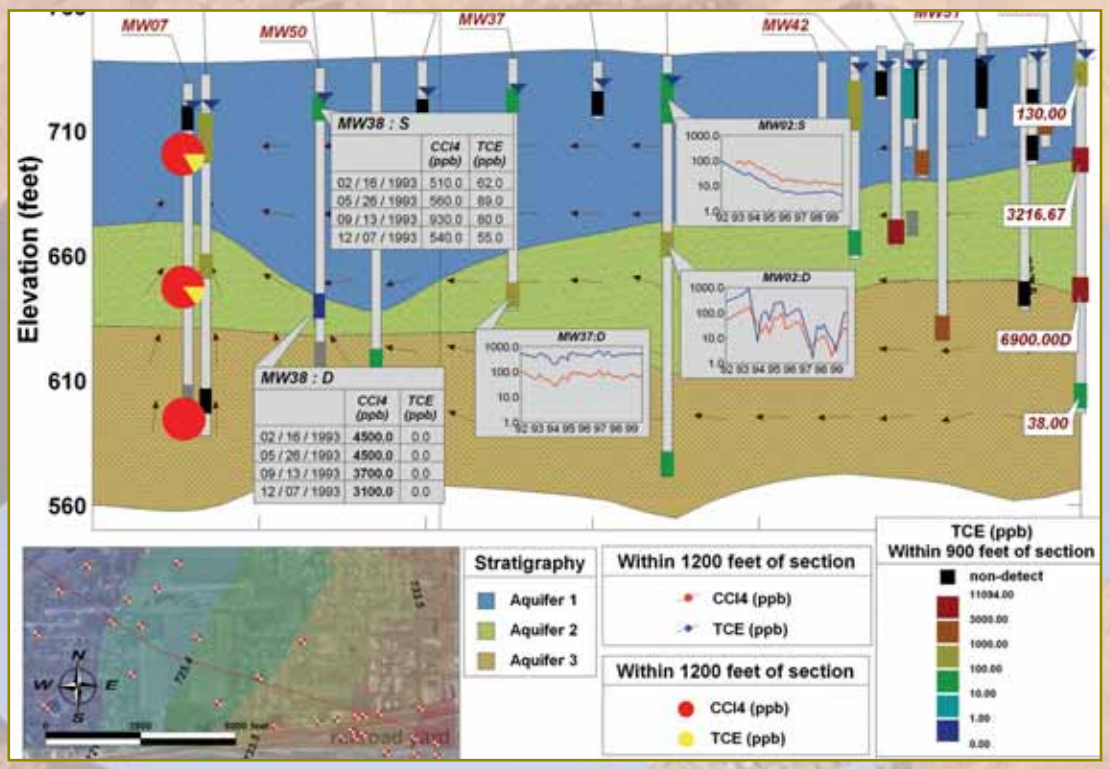

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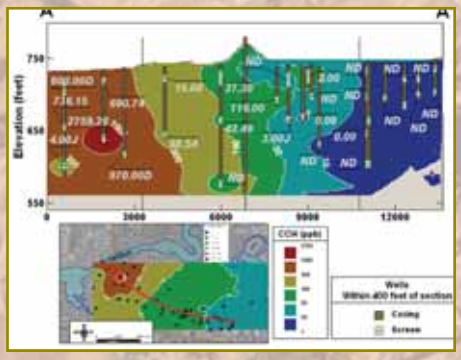

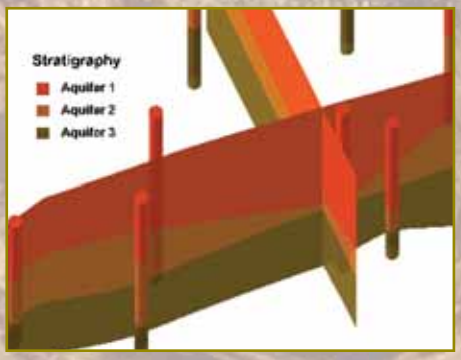

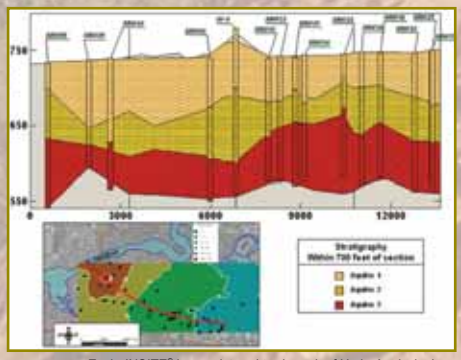

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VOLUME 16, NUMBER 6

JUNE 2006

Cover: Philadelphia, the Appalachians, and Long Island. Image courtesy of Earth Sciences and Image Analysis Laboratory, NASA Johnson Space Center. Mission: ISS006 Roll: E Frame: 35659, http://eol.jsc.nasa.gov.

Philadelphia 2006: The Pursuit of Science—Building on a Foundation of Discovery GSA Annual Meeting & Exposition

Erratum: Peter Lipman's name was inadvertently left out of the Foundation Board of Trustees list in the Foundation Update for the April/May *GSA Today*.

GSA TODAY

GSA TODAY publishes news and information for more than 20,000 GSA members and subscribing libraries. *GSA Today* lead science articles should present the results of exciting new research or summarize and synthesize important problems or issues, and they must be understandable to all in the earth science community. Submit manuscripts to science editors Keith A. Howard, khoward@usgs.gov, or Gerald M. Ross, lavaboy@verizon.net.

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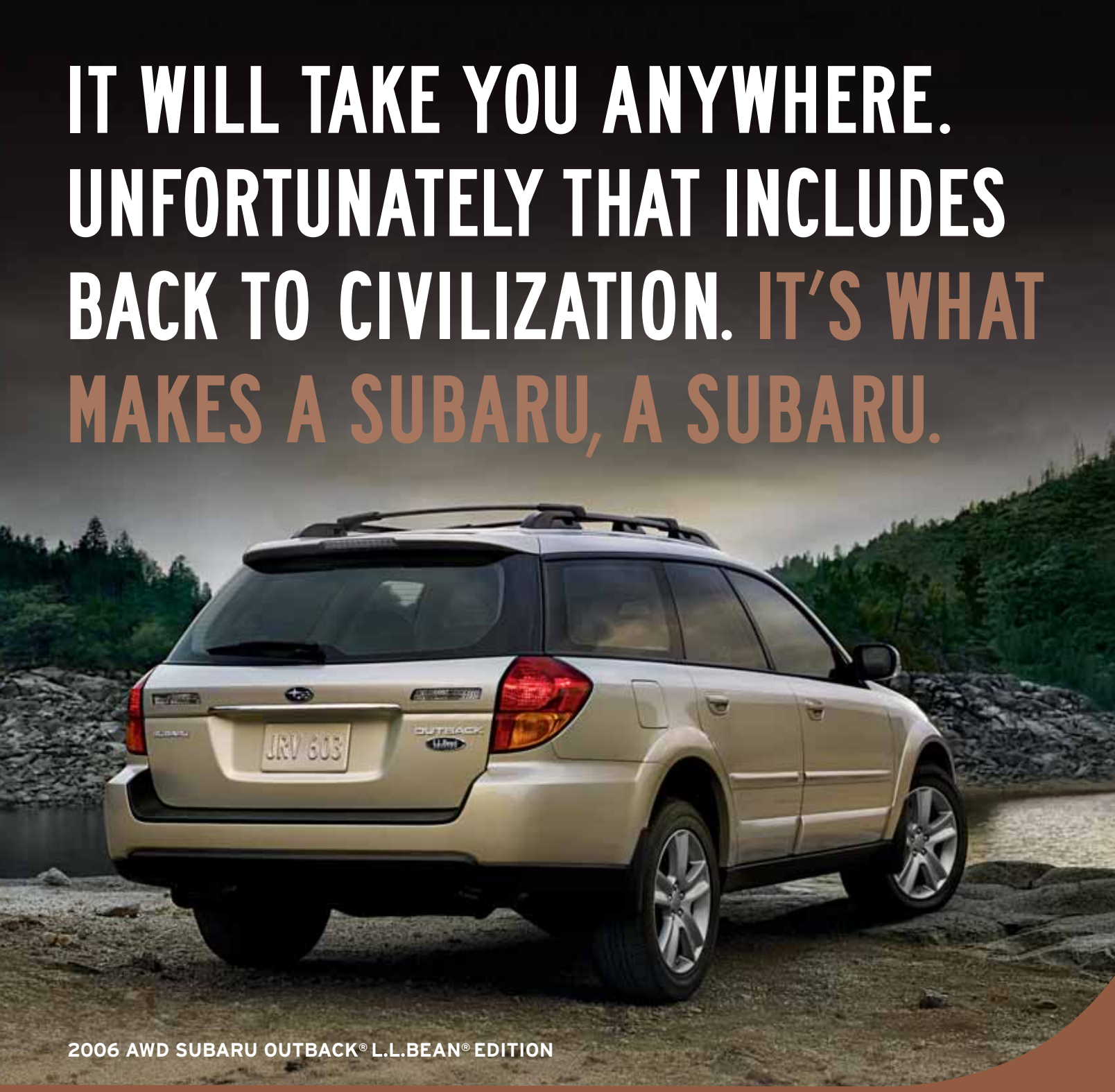

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The Pursuit of Science

PHILADELPHIA 2006

Building on a Foundation of Discovery

Recent responses to devastating natural disasters and escalating pressures on natural resources remind us of the need for the pursuit and distribution of objective, timely, and peer-reviewed scientific information. The 2006 GSA Annual Meeting will convene in Philadelphia and address this challenge under the theme of *The Pursuit of Science: Building on a Foundation of Discovery.*

The 2006 annual meeting will be an exciting and historic event that corresponds with the 300th birthday of Benjamin Franklin, one of the nation's most celebrated scientists and a visionary leader in the integration of science, public policy, and the open exchange of information. Philadelphia is widely known for its historic buildings and was the site of the signing of the Declaration of Independence, the Constitutional Congress, and the nation's first capital. Philadelphia was also the center of natural science in the colonies and the fledgling nation; many of the city's oldest museums, libraries, and scientific collections date from the era, and the efforts, of Benjamin Franklin. Today, the Philadelphia area supports over 100 museums, arboreta, and other scientific collections, including the Academy of Natural Sciences, the home of the first dinosaur skeleton discovered in the Americas; the first zoo in the western hemisphere; and the recently opened Fairmount Water Works Interpretive Center, a museum of watershed dynamics and history of the first modern municipal water-supply facility in the New World.

Many of North America's first geologists traveled regularly to Philadelphia to exchange information and share recent discoveries. Our 2006 annual meeting will carry on that tradition of the open exchange of scientific information and ideas through field trips, sessions, special symposia, and the public forum. Please engage in this information exchange and the excitement of discovery by submitting abstracts and encouraging your colleagues to submit abstracts by 11 July 2006.

We look forward to welcoming many thousands of you to the City of Brotherly (and Sisterly) Love.

Robert Giegengack and Fred Scatena, University of Pennsylvania

2006 Annual Meeting General Co-Chairs

Important Dates, Events & Deadlines

Registration Opens	Early June
Space Request Deadline	21 June
Abstract Deadline	11 July
Standard Registration Deadline	18 Sept.
Cancellation Deadline	25 Sept.
Premeeting Field Trips	18–21 Oct.
Short Courses & Workshops	Sat.–Sun., 21–22 Oct.
Presidential Address & Awards Ceremony	Sat., 21 Oct., 7–9 p.m.
Welcoming Party & Exhibits Opening	Sun., 22 Oct., 5:30–7:30 p.m.
Technical Program	Sun.–Wed., 22–25 Oct.
Pardee Keynote Symposia	Sun.–Wed., 22–25 Oct.
Private Alumni Receptions	Mon., 23 Oct., 5:30 p.m.–1 a.m.
Group Alumni Reception	Mon., 23 Oct., 7–9:30 p.m.
Exhibit Hall Hours	Sun., 22 Oct., 5:30–7:30 p.m.
	Mon.–Tues., 23–24 Oct., 9 a.m.–5:30 p.m.
	Wed., 25 Oct., 9 a.m.–2 p.m.
Hot Topics	Sun.–Wed., 22–25 Oct., 12:15–1:15 p.m.
Postmeeting Field Trips	25–28 Oct.

THE GEOLOGICAL SOCIETY OF AMERICA

Annual Meeting & Exposition

22–25 October 2006
Philadelphia, Pennsylvania

2006 Annual Meeting Local Committee

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gieg@sas.upenn.edu

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Image: Ben Franklin National Memorial at the Franklin Institute Science Museum. Photo by Rich Dunoff, courtesy of the Philadelphia Convention and Visitors Bureau.

Special Events

GSA PRESIDENTIAL ADDRESS & AWARDS CEREMONY

Sat., 21 Oct., 7–9 p.m.

Pennsylvania Convention Center

Join us Saturday evening when GSA President Stephen G. Wells gives his Presidential Address and presents the 2006 Awards and Medals. Recipients of the Penrose Medal, the Arthur L. Day Medal, the Young Scientist Award (Donath Medal), the GSA Public Service Award, the GSA Distinguished Service Award, and the American Geological Institute (AGI) Medal in Memory of Ian Campbell will be honored. The newly elected Honorary Fellows, the Subaru Outstanding Woman in Science Awardee, the GSA Divisions Awardees, and the GSA newly elected Fellows will also be announced. A reception will immediately follow the ceremony. The 2006 awardees will also be listed in the July issue of *GSA Today*.

EXHIBITS OPENING & WELCOME PARTY

Sun., 22 Oct., 5:30–7:30 p.m.

Pennsylvania Convention Center

Come enjoy the opening of the Exhibit Hall on Sunday evening, immediately following the technical sessions. The welcoming party proves to be a great networking time with colleagues and friends as well as a good opportunity to view the exhibits and enjoy a beverage.

AWARDS LUNCHEONS AND OTHER TICKETED GROUP FUNCTIONS

GSA Associated Societies and GSA Divisions invite their members and other interested guests to join them for their annual meeting meal functions, special addresses, and awards ceremonies. Only a few tickets will be available on-site, so please register early for ticketed functions. The location and time of events will appear on your ticket and in the 2006 Annual Meeting Program. You can also find more details at www.geosociety.org/meetings/2006.

GROUP ALUMNI PARTY

Mon., 23 Oct., 7–9:30 p.m.

Join your former classmates and colleagues at this year's Group Alumni Party. The location will be posted on GSA's official meeting Web site, www.geosociety.org/meetings/2006, and listed in the 2006 Annual Meeting Program.

To include your school in the Group Alumni Party, go to https://rock.geosociety.org/Space_Request and complete the space request form, or contact Lisa Smith, lsmith@geosociety.org, 1+303-357-1041.

PRIVATE ALUMNI RECEPTIONS

Mon., 23 Oct., 5 p.m.–1 a.m.

Plan to join your fellow alumni for an evening of memories and renewed connections. Please see GSA's official meeting Web site, www.geosociety.org/meetings/2006, or the 2006 Annual Meeting Program for a list of schools holding individual alumni receptions and the event locations.

If you would like to hold a private alumni reception, check with your department head, who may have already arranged this with GSA, or go to https://rock.geosociety.org/Space_Request and complete the space request form, or contact Lisa Smith, lsmith@geosociety.org, 1+303-357-1041.

BEER & GEOLOGY SESSION

Sun., 22 Oct., 7:30–9:30 p.m.

Pennsylvania Convention Center

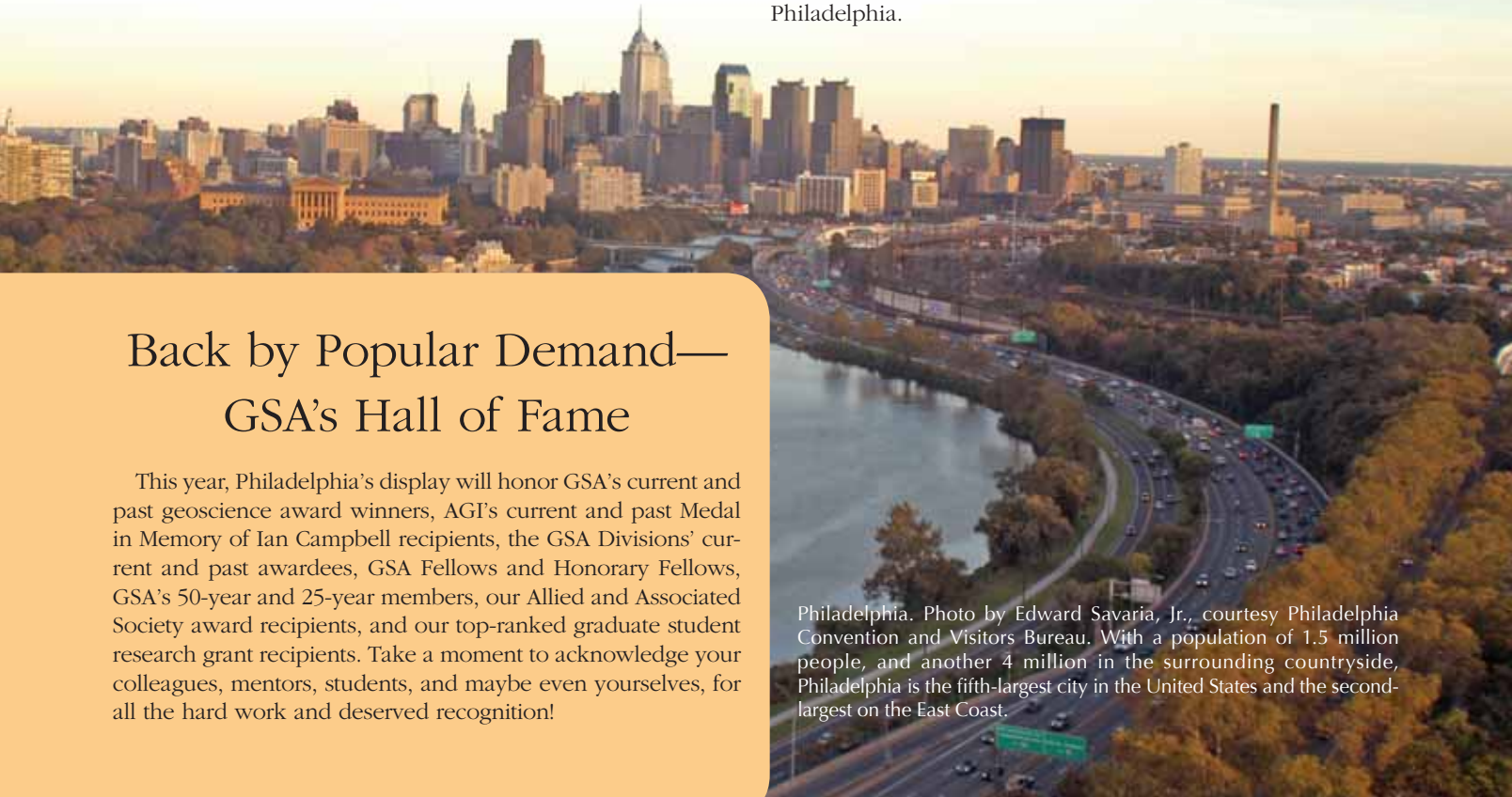
Come explore the effects of geology on the brewing process! *You must be 21 years of age with proper identification to participate in the beer sampling portion of this session.* For details go to www.geosociety.org/meetings/2006/.

THINGS TO DO IN PHILADELHPHIA

Please see GSA's official meeting Web site, www.geosociety.org/meetings/2006, for additional things to do while in Philadelphia.

Back by Popular Demand—GSA's Hall of Fame

This year, Philadelphia's display will honor GSA's current and past geoscience award winners, AGI's current and past Medal in Memory of Ian Campbell recipients, the GSA Divisions' current and past awardees, GSA Fellows and Honorary Fellows, GSA's 50-year and 25-year members, our Allied and Associated Society award recipients, and our top-ranked graduate student research grant recipients. Take a moment to acknowledge your colleagues, mentors, students, and maybe even yourselves, for all the hard work and deserved recognition!



Philadelphia. Photo by Edward Savaria, Jr., courtesy Philadelphia Convention and Visitors Bureau. With a population of 1.5 million people, and another 4 million in the surrounding countryside, Philadelphia is the fifth-largest city in the United States and the second-largest on the East Coast.

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Go to http://www.geosociety.org/meetings/2006/sponsorship.htm for information on GSA Annual Meeting sponsorship opportunities.

To become a sponsor, contact William Cox at +1-303-357-1013, wcox@geosociety.org.

Nominate Your Next Officers and Councilors!

Nominations Accepted until 1 August 2006

The GSA Committee on Nominations requests nominations for officers (vice president and treasurer) and councilors to serve on GSA Council beginning in 2007. Each nomination should be accompanied by basic data and a description of the qualifications of the individual for the position recommended.

The online nomination form is available at www.geosociety.org/aboutus/commtees/, or you may send materials for officer and councilor nominations to Pamela Fistell, GSA, P.O. Box 9140, Boulder, CO 80301-9140, pfistell@geosociety.org.

2006 Exhibitors

Exhibitors are listed by category as registered by press copy deadline. See up-to-the-minute listings of exhibitors at www.geosociety.org/meetings/2006/xinfo.htm.

Computer Software
ESRI
GEON
iGage Mapping
Leica Geosystems Geospatial Imaging
RockWare Inc.

Gems/Minerals Dealers, Jewelry/Gifts
Gems & Crystals Unlimited
Howard Minerals
IKON Mining & Cal Graeber
Komodo Dragon
Nature's Own

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IRIS Consortium
Ward's Natural Science Est., LLC

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Armfield
Forestry Suppliers Inc.
Rite in the Rain

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ASC Scientific
Bruker AXS
Cameca Instruments Inc.
Campbell Scientific Inc.
CETAC Technologies
DeltaNu LLC
EmCal Scientific Inc.
Gatan Inc.
Geophysical Survey Systems Inc.
GV Instruments Inc.
HORIBA Jobin Yvon Inc.
Leica Microsystems
Marks Products Inc.
Meiji Techno America
New Wave Research
Panalytical
Rigaku
Sensors & Software Inc.
Soilmoisture Equipment Corp
Thermo Electron

Government Agencies (Federal, State, Local, International)
Geoscience Laboratories
NASA—Earth System Science
National Park Service
National Science Foundation
Oklahoma Geological Survey
U.S. Bureau of Land Management
U.S. Geological Survey
USDA Forest Service

Other
Earth Science-Cyberinfrastructure (ES-CI) Forum
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EarthScope
Environmental Careers Organization
Gemological Institute of America
Geosystems
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Association of American State Geologists
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Geoscience Information Society
GeoScienceWorld
GSA History of Geology Division
History of Earth Sciences Society (HESS)
International Association of GeoChemistry
Mineralogical Association of Canada
Mineralogical Society of America
National Association of Geoscience Teachers
National Cave & Karst Research Institute
National Earth Science Teachers Association
The Paleobiology Database
The Paleontological Society
Sigma Gamma Epsilon
Society for Advancement of Chicanos and Native Americans in Science (SACNAS)
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Society of Economic Geologists
Southern California Earthquake Center

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Attention Annual Meeting attendees! Come see the exhibits and support our GSA exhibitors. Join a community of over 6,000 geoscientists mingling with exhibitors at the Pennsylvania Convention Center. We have a lot of new and exciting exhibitors this year, so stop by to visit, purchase, inquire, sign up, and catch up!

EXHIBITS OPENING & WELCOMING PARTY
Sun., 22 Oct……..5:30–7:30 p.m.

EXHIBIT HALL HOURS
Mon.–Tues., 23–24 Oct……..9 a.m.–5:30 p.m.
Wed., 25 Oct……..9 a.m.–2 p.m.

2006 Tyler Prize

David W. Schindler

Killam Memorial Chair & Professor of Ecology
University of Alberta, Edmonton
Alberta, Canada

Igor A. Shiklomanov

Director
State Hydrological Institute (SHI)
St. Petersburg, Russian Federation

Tyler Prize

The late John and Alice Tyler established the Tyler Prize in 1973 as an international award honoring achievements in environmental science, policy, energy and health of worldwide importance conferring great benefit on humanity. The Tyler Prize consists of a cash award of $200,000 and a gold Tyler Prize medallion.

The Tyler Prize Executive Committee announces the awarding of the 2006 Tyler Prize for Environmental Achievement on its thirty-third anniversary to Dr. David W. Schindler, and Prof. Dr. Igor A. Shiklomanov. Drs. Schindler and Shiklomanov have each made fundamental contributions to understanding and protecting aquatic resources through research, education and the influence of their work on national and global environmental policy.

David W. Schindler is recognized for his discoveries, made through interdisciplinary experimental research and ecological hypothesis testing, that contribute to understanding how anthropogenic stressors affect the health of freshwater ecosystems. Insights from his work have provided guidance for mitigation of these adverse affects. He has been a leader in documenting the impacts of global climate change on aquatic ecosystems and their resources.

Igor A. Shiklomanov is recognized world wide as an international authority in the field of hydrology and water resources and for the development of methods for the assessment and forecasting of human impacts on river runoff, the dynamics of water use and water availability and the linkages between humanity and the world's freshwater resources. His work has affected the way in which we think about water usage worldwide, and the way in which international water projects are designed.

Recent Laureates

2000 John Holdren, for Energy and Environmental Security Policy
2001 Jared Diamond and Thomas Lovejoy, for Conservation Biology
2002 Wallace Broecker, for Ocean Chemistry and Tungsheng Liu, for Paleoclimatology
2003 Sir Richard Doll, Hans Herren, and Yoel Margalith, for Environmental Medicine and Public Health
2004 The Barefoot College, and Red Latino Americana de Botanica (RLB) for Environmental Education
2005 Charles David Keeling and Lonnie Thompson, for Atmospheric Chemistry and Glaciology related to Climate Change

For additional information and nominations contact:

Dr. Linda E. Duguay, Executive Director, The Tyler Prize
Phone (213)-740-9760, Fax 213-740-1313
Email: tylerprz@usc.edu | www.usc.edu/tylerprize
The Tyler Prize is administered by the University of Southern California

Members of the Tyler Prize Executive Committee

Dr. Owen T. Lind, Chair, *Baylor University*
Dr. Rosina M. Bierbaum, *University of Michigan*
Dr. Joel E. Cohen, *Rockefeller & Columbia Universities*
Dr. Robert A. Frosch, *Harvard University*
Dr. Arturo Gómez-Pompa, *University of California, Riverside and Universidad Veracruzana*
Dr. James V. Maloney, Jr. M.D., *University of California, Los Angeles*
Dr. Judith E. McDowell, *Woods Hole Oceanographic Institution*
Dr. Ralph Mitchell, *Harvard University*
Dr. F. Sherwood Rowland, *University of California, Irvine*
Dr. Jonathan M. Samet, *The Johns Hopkins University*
Dr. Cornelius W. Sullivan, *University of Southern California*

GSA MENTOR PROGRAMS

2006 GSA Annual Meeting & Exposition

Philadelphia, Pennsylvania

Seeking Employment? Plan to attend the Careers Roundtable Discussions
Sun., 22 Oct. 2006, 10 a.m.–noon

Don't miss this opportunity to talk with geoscience professionals who are willing to share their insight about the job market. These mentors—all offering one-on-one career advice—hail from a broad range of geoscience-related career choices, representing academics, industry, and government agencies. If you are seeking employment, or will be in the future, join this group for networking opportunities and job-market perspectives. This FREE come-and-go event is **open to everyone;** registration is not required. Pennsylvania Convention Center, GSA Employment Services area.

Attention Students Pursuing a Hydrogeology Career Path!

The Mann Mentors in Applied Hydrogeology Program makes it possible for up to 25 students to attend the distinguished GSA Hydrogeology Division awards presentation luncheon, without cost to the students. Eligible students will have the chance to meet some of the nation's top hydrogeologists and witness the presentation of the Hydrogeology Division's coveted awards. **Eligible students are those who checked the box on their membership application indicating their professional interest in hydrology/hydrogeology and who have registered for the Annual Meeting by 11 September 2006.** FREE tickets will be awarded to the first 25 students who respond to an **e-mail invitation**, based on the eligibility criteria above. Registration required.

Students, Check Out the GEOLOGY IN GOVERNMENT Mentor Program!
Mon., 23 Oct. 2006, 11:30 a.m.–1:00 p.m.

Plan to arrive early for this FREE lunch for undergraduate and graduate students to be held at GSA's Philadelphia meeting. This popular annual event will feature a select panel of mentors representing various government agencies. Mentors will invite questions from students, offer advice about preparing for a career, and comment on the prospects for current and future job opportunities with their agencies. **Registration is not required;** every student registered for the annual meeting will receive a ticket to this event along with their badge. Attendance is limited, however, so please arrive early!

Times and exact locations will be noted in the annual meeting program.

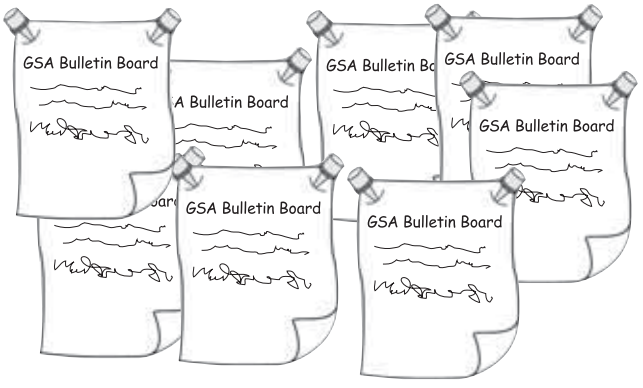
For more information about GSA's Mentor Programs, contact kblythe@geosociety.org.

VISIT THE GSA MEETINGS BULLETIN BOARD

Use the GSA Bulletin Board to help plan your travel and accommodations at the GSA Annual Meeting and all official GSA meetings. Save money by sharing travel and lodging expenses with other meeting attendees.

It's Free! Just go to http://rock.geosociety.org/forumstudenttravel/ to get started.

See you in Philadelphia!



Geoscience Educators' SOCIAL RECEPTION

Saturday, 21 Oct., 5–7 p.m.

The GSA Education Committee, the National Association of Geoscience Teachers (NAGT), the GSA Geoscience Education Division, Cutting Edge, the Digital Library for Earth System Education (DLESE), the IRIS Consortium, the American Geological Institute (AGI), Earthscope, the National Earth Science Teachers Association (NESTA), and UNAVCO would like to invite all educators to a relaxing forum for socializing, sharing ideas, and meeting other geoscience community members interested in education.

Come meet the GSA Education Staff.
Appetizers and cash bar provided.

President's Student Breakfast Reception

Sunday, 22 Oct., 7–8:30 a.m.
Sponsored by

ExxonMobil

Hosted by GSA

GSA President Stephen G. Wells invites all students registered for the meeting to attend a free breakfast buffet sponsored by ExxonMobil Corporation. Stephen Wells and members of GSA leadership, along with ExxonMobil staff members, will be on hand to answer questions and address student issues. This will also be a time to recognize the Subaru Outstanding Woman in Science awardee, the top-ranked graduate student research grant recipients, as well as to acknowledge other student research grant recipients and all student Division awardees.

Each student registered for the meeting will receive a complimentary ticket for the breakfast buffet. This is one of the most popular events at the meeting for students, and with good reason! Take this opportunity to network with fellow students, meet the officers of GSA, and recognize fellow student award recipients!

Student Scholarships For Field Trips

As part of the Roy J. Shlemon Meeting Awards Program, GSA's **Engineering Geology Division** provides funding to graduate and undergraduate students attending GSA field trips. The only criteria are that you must be a student member of the Engineering Geology Division and that you are making satisfactory progress toward your degree. For a detailed description of this program, you can visit http://rock.geosociety.org/egd/index.html and click on "Scholarships." If you need more information, you can reach Rob Larson at ralarson1@dslextreme.com. **Deadline for applications:** 1 Aug. 2006.

GSA's **Structural Geology and Tectonics Division** is offering scholarships to Division-affiliated student members for division-sponsored field trips. Apply in writing, by e-mail, giving your name, institution, class, specialty, poster or talk title, field trip title, and a one-paragraph rationale to Peter Vrolijk, peter.vrolijk@exxonmobil.com. See the Structural Geology and Tectonics Division newsletter for more information.

GSA Section Travel Grants

The GSA Foundation has made $4,500 in grants available to each of the six GSA Sections. The money, when combined with equal funds from the Sections, is used to help GSA undergraduate Student Associates and graduate Student Members travel to GSA meetings. For information and deadlines, go to www.geosociety.org/sectdiv/sections.htm or contact your Section secretary.

GSA Student Travel Fund

GSA is pleased to offer assistance to member undergraduate and graduate students to help cover some of the costs associated with attending the GSA Annual Meeting. A fund has been set up within the GSA Foundation for attendee contributions, and GSA and the Foundation will each contribute US$1,000 for the 2006 Philadelphia Annual Meeting. The number and amount of awards will be solely based on contributions received; 100% of the contributions received will go to help fund student travel. For more information or to apply online, go to www.geosociety.org/meetings/2006.

Student Scholarships Available For Short Courses

If you are planning to attend any of the GSA-sponsored short courses (p. 23 of this issue), check here first!

- GSA's **Geoscience Education Division** will subsidize the first five student registrants who are valid division members. The student must pay the full course fee when registering, but will be reimbursed US$50 after the GSA meeting by the Geoscience Education Division.
- GSA's **Engineering Geology Division** will subsidize the first five student registrants who are valid division members. Students must pay the full course fee when registering, but will be reimbursed US$50 after the GSA meeting by the Engineering Geology Division.
- GSA's **Quaternary Geology and Geomorphology Division** will subsidize the first five student registrants who are valid division members. Students must pay the full course fee when registering, but will be reimbursed US$50 after the GSA meeting by the Quaternary Geology and Geomorphology Division.

For more information, contact Karlon Blythe, kblythe@geosociety.org.

GSA's Third Annual FREE Research Proposal Writing Workshop

If you are interested in improving your chances of receiving a GSA student research grant or are looking for tips to improve your proposal writing for future funding, come join GSA's proposal-writing workshop aimed specifically at graduate students. Led by a member of the GSA Research Grant Committee, this workshop will be based on recent GSA graduate research grant proposals and will put several examples into hypothesis-driven studies to illustrate the dos and don'ts to the proposal-writing process. A brief overview of the review process by the GSA research grant committee will also be outlined. Please check www.geosociety.org/grants in August for updates on the date, time, and location.

ATTENTION STUDENTS!

Raise your hand if you would like to attend the 2006 GSA Annual Meeting & Exposition in Philadelphia.

If your pockets are empty, think about becoming a **student volunteer.**

FREE registration by volunteering 10 hours

FREE *Abstracts with Programs* volume by volunteering 15 hours

To volunteer, you must be a GSA Student Member or Student Associate.

Volunteers will receive a stipend of $25 for every 5 hours volunteered. (Optional partial food stipend available.)

For more information, contact Mollie VanOtterloo, mvanotterloo@geosociety.org, +1-303-357-1060.

Philadelphia 2006 Guest Program

We extend a warm welcome to all guests at the 2006 GSA Annual Meeting & Exposition in Philadelphia, Pennsylvania!

To register as a guest, please complete the registration form online at www.geosociety.org/meetings/2006, or send the registration form in this issue by mail to GSA, P.O. Box 9140, Boulder, CO 80301-9140, USA, or by fax to +1-303-357-1071.

The guest registration fee of US$80 per person (if registered by 18 Sept.; after 18 Sept., the fee is US$85) is for nongeologist spouses, family members, or friends of a professional and/or student registrant. The guest registration fee is required for those attending all guest activities, tours, seminars, access to the Exhibit Hall, and for refreshments in the Guest Hospitality Suite. The guest registration fee will not provide access to technical sessions; however, guests can sign in with the hostess in the Guest Hospitality Suite to get a visitor badge, allowing entrance to specific presentations. Formal guest tours, listed in the following section, are at an additional cost and include professional tour guides, round-trip transportation, admission fees, and gratuities.

TOURS

All GSA Annual Meeting guests are welcome to register for the following guest program tours. Reservations for all tours will be accepted on a first-come, first-served basis. The tour operator requires a final guarantee weeks in advance. Most tours have attendance minimums as well as maximums. **Tours may be canceled if minimum attendance is not met. Please register early to guarantee your spot.**

On the day of the tour, guests should check in at the Guest Hospitality Suite; they will then be directed to the departure location at the Pennsylvania Convention Center. **Plan to arrive at the departure location 15 minutes before the scheduled departure time to make sure you don't miss the bus.**

The Philadelphia area has a great deal to offer and the formal tours can only cover a small portion of what is available for you to see and do. You may enjoy visiting other area attractions with fellow guests or go it alone on a self-guided tour. The Guest Hospitality Suite hostess can provide you with more information and activity suggestions.

Philadelphia Mural Tour [101]
Sun., 22 Oct., 1 p.m.–3 p.m.

It is a little-known fact that Philadelphia is the Mural Capital of the United States. Home to approximately 2,300 indoor and outdoor murals throughout the city, these murals have brought art to the cityscape. This tour, led by docents, many of whom are mural artists, offers a "behind the scenes" look at how and why murals are created. Filled with anecdotes and stories, the tour will leave guests with a deeper appreciation for the complexities of mural making and an empowering notion that art has the power to transform lives and communities. Cost: US$53. Minimum: 25 guests.

Best of Philadelphia Half-Day Tour [102]
Sun., 22 Oct., 1 p.m.–4 p.m.

Guests will enjoy an overview of Philadelphia's highlights. Traveling via Victorian Trolley, guests will have the opportunity to explore Philadelphia's heritage and get a taste for the flavor of Philly. Stops include the Betsy Ross House, Elfreth's Alley, Christ Church, the Liberty Bell, and Independence Hall. This tour offers guests an all-encompassing view of Philadelphia's architecture, history, and culture. A knowledgeable guide will lead guests through the cobblestone streets where our founding fathers once walked among the sights and sounds unique to Philadelphia. Cost: US$43. Minimum: 25 guests.

Picnic and History Tour of Laurel Hill Cemetery [103]
Mon., 23 Oct., 10 a.m.–1 p.m.

Abutting Fairmount Park is Laurel Hill Cemetery, whose tombstones, monuments, and mausoleums can be seen from Kelly Drive. A walk along its paths will enable guests to see a vanishing piece of America—the Gothic, cluttered cemetery, which is fast disappearing. Planned as early as 1835 and laid out by John Notman, the site was once the country seat of Joseph Sims, called Laurel. Laurel Hill is truly a necropolis, a city of the dead, yet is situated in one of the most romantic spots in Philly, overlooking Kelly Drive and the Schuylkill. October is the perfect time to explore the rich history and beauty of this magnificent local cemetery. Cost: US$53. Minimum: 25 guests. Boxed lunches provided.

Best of Philadelphia Tour with Lunch on Your Own at the City Tavern [104]
Mon., 23 Oct., 9 a.m.–3 p.m.

Guests will travel via Victorian Trolley from the Delaware River to the Schuylkill River and have the opportunity to explore Philadelphia's heritage as well as its contemporary magnificence. From stops at the Betsy Ross House, Elfreth's Alley, and Christ Church to a run up the famous "Rocky" steps, this tour offers guests an all-encompassing view of Philadelphia's architecture, history, and culture. A knowledgeable guide will lead guests through the cobblestone streets where our founding father's once walked. The tour will visit an often-missed Quaker Meeting House as well as Carpenter's Hall, where the meeting of the first Continental Congress took place. Guests will enjoy the Georgian and Federal style houses as they walk along Pine Street and Philly's antique row. Lunch will be enjoyed on your own on the porch of the very charming City Tavern. After lunch, guests will make their way to Center City to discover some of Philly's newer traditions, such as the Kimmel Center for Performing Arts along the Avenue of Arts and the Philadelphia Museum of Art along the Benjamin Franklin Parkway. Cost: US$58. Minimum: 25 guests.

Amish Countryside Tour [105]
Mon., 23 Oct., 8 a.m.–4 p.m.

Guests will visit a simpler way of life as they tour the bucolic countryside of Lancaster County, only a short ride from Philadelphia. Guests will enjoy the scenery as well as the culture and way of life of the Amish. From roadside horse and buggies to one-room schoolhouses and expansive farmland, the natural beauty of the landscape, charming homesteads, and working farms are enchanting. Stopping at roadside stands, guests will

enjoy shopping, the area's unique allure. Handmade quilts, hex signs, and homemade jams are all part of Lancaster's shopping experience. Guests will stop for lunch at Lancaster's original family-style dining room, Plain and Fancy Farm, where everyone is told to "eat yourself full" of mouth watering, all-you-can-eat platters of Amish cuisine, including the Pennsylvania Dutch specialty, Shoofly Pie. After lunch, guests will learn more about Amish culture as they enjoy the viewing of "Jacob's Choice," a critically acclaimed movie presented in the F/X theater. This dramatic tale of an Amish family's effort to preserve their lifestyle and culture is unforgettably told through a high-tech, multi-media production conceived in the finest tradition of Hollywood or Orlando-themed attractions. After this moving presentation, guests will have the opportunity to tour a working farm and Amish homestead prior to returning to Philadelphia. Cost: US$118. Minimum: 25 guests. Lunch included.

Fairmount Park Houses Tour [106]
Tues., 24 Oct., 9 a.m.–noon

Guests will visit Philadelphia's colonial past. Amid 8000 acres of wooded hills lie some of the city's greatest treasures: seven eighteenth- and nineteenth-century historic houses that were once homes of eminent Philadelphians. Guests will discover the history, architecture, culture, and decorative art of three original estates, including Mount Pleasant and Cedar Grove. On the banks of the Schuylkill River, these homes functioned as working farms as well as elegant, fashionable, and healthy retreats from Philadelphia's urban environment, summer heat, and periodic epidemics. Cost: US$40. Minimum: 25 guests.

The Academy of Natural Sciences & Museum of Archaeology and Anthropology: Natural History Museum Tour [107]
Tues., 24 Oct., 9 a.m.–3 p.m.

Located at Logan Circle and the Benjamin Franklin Parkway, The Academy of Natural Sciences houses a world-renowned natural history collection. The museum offers a special opportunity to explore North American animals in their natural habitats as well as dinosaur mounts and live butterflies. After visiting this long-standing natural history museum, guests will head to University City to view the Museum of Archaeology and Anthropology. Founded in 1887, this outstanding museum offers visitors a glimpse into the past and around the world. During the past 100 years, the museum has conducted more than 350 research expeditions around the world and has collected more than one million objects, many obtained directly through its own field excavations or anthropological research. These are exciting projects, and the discoveries are revealing, sometimes mysterious, and almost always quite beautiful. Best of all, visitors do not have to brave the perils of remote deserts and jungles to see them. Stopping for lunch between museum visits, guests will enjoy a visit to World Café Live, Philadelphia's newest music venue. Here, guests can enjoy lunch on their own at the café while listening to live music performed by a local singer-songwriter. Cost: US$58. Minimum: 25 guests.

Winterthur and Longwood Gardens Tour [108]
Tues., 24 Oct., 8 a.m.–4 p.m.

Enjoy a beautiful day among the grand gardens of the DuPonts. Created by industrialist Pierre S. DuPont, Longwood Gardens is sure to delight those who love exquisite flowers, majestic trees, and opulent architecture. The garden's 1,050 acres of woodlands, meadows, and heated greenhouses include over 11,000 varieties of plants, spectacular fountains, and beautiful walking paths. Stroll through the conservatory, reflect at the water garden, and enjoy amazing topiary sculptures. Guests will have an opportunity to enjoy lunch on their own at Longwood Gardens' Terrace Restaurant prior to visiting Winterthur. Upon visiting Winterthur, guests will immerse themselves in the breathtaking beauty of the Winterthur Estate. Wandering through this 60-acre naturalist garden landscape, guests learn about the workings of this 1800s American Country Estate and rediscover America's heritage through the unparalleled collection of antiques. Cost: US$73. Minimum: 20 guests.

Morris Arboretum and the Valley Green Inn [109]
Wed., 25 Oct., 9 a.m.–2 p.m.

Traveling through the boutique town of Chestnut Hill, guests will visit the Morris Arboretum. Here, thousands of rare and lovely plants, including many of Philadelphia's oldest and largest trees, are set among a romantic Victorian landscape of gardens, winding paths, streams, flowers, and wildlife. Relax and walk the paths of this University of Pennsylvania–run arboretum. After walking the gardens, guests will ride a Victorian trolley to the Forbidden Drive. Here, guests will take a horse-drawn carriage to the Valley Green Inn for a quick lunch on their own. Walk the grounds and enjoy this quaint 150-year-old Philadelphia dining establishment and its charming flock of ducks. Cost: US$73. Minimum: 25 guests.

Philadelphia 2006 Field Trips

Students, spouses, and interested guests are cordially encouraged to attend these GSA field trips. The trips this year offer a wide range of technical content and physical rigor. Interested participants are encouraged to read the trip summaries carefully and contact trip leaders for specifics, and should also be prepared for a variety of weather conditions. Trips are one to three days in duration and are led by active field researchers.

If you register for only a field trip, you must pay a nonregistrant fee of US$40 in addition to the field trip fee. This fee may be applied toward meeting registration if you decide to attend the meeting. Trip fees include transportation during the trip and a guidebook. Other services, such as meals and lodging, are noted by the following symbols: B—breakfast, L—lunch, R—refreshments, D—dinner, ON—overnight lodging.

All trips begin and end at the Pennsylvania Convention Center in Philadelphia unless otherwise indicated. Upon return, some post-meeting trips can stop at the Philadelphia International Airport to discharge participants who have evening flights or would prefer to spend the night in a hotel closer to the airport. Trip itinerary details will be provided upon registration and can also be obtained directly from the field trip leaders; however, participants are cautioned against scheduling any tight travel connections with field trip return times, as those time estimates and delays in the field may occur. For a list of hotels near the airport, contact Mollie VanOtterloo, +1-303-357-1060, mvanotterloo@geosociety.org.

A true-color view of the northeastern United States, taken from the National Aeronautics and Space Administration's Multi-angle Imaging SpectroRadiometer (MISR). Larger cities, including Philadelphia, are visible. Image courtesy Earth Observatory, http://earthobservatory.nasa.gov/Newsroom/NewImages/images.php3?img_id=15289.

PREMEETING

1. Along-Strike Changes in the Architecture of a Fold-Thrust Belt: An Example from the Hudson Valley, New York [401]

Thurs.–Sun., 19–21 Oct. Kurtis C. Burmeister, Dept. of Geosciences, University of the Pacific, 3601 Pacific Ave., Stockton, CA 95211-0110, USA, +1-217-369-2733, fax +1-213-740-8801, kburmeister@pacific.edu; Steve Marshak. Max.: 30; min.: 12. Cost: US$245 (2ON, vans).

This trip will visit classic exposures of the Hudson Valley Fold-Thrust Belt in the region between the towns of Catskill and New Paltz. This region has been called a "fold-thrust belt in miniature" because of the dimensions of the structures. The dimensions and character of structures change along strike due to changes in predeformational stratigraphy. The drive to and from the field area will provide an opportunity to see the overall structural framework of the Appalachians in the heart of the New York Recess. Outcrops visited during the trip will allow examination of lithologic controls on pressure-solution cleavage development and discussion of factors controlling the development of map-view curves (e.g., oroclines) in fold-thrust belts. The nature of the transition between the Hudson Valley mini-thrust belt and the Pennsylvania Valley and Ridge megathrust belt will be discussed.

2. Behind the Scenes at the American Philosophical Society, the Library Company, and the Academy of Natural Sciences: Research Collections in the History of Geology and Paleontology [402]

Fri., 20 Oct. Cosponsored by *GSA History of Geology Division*. Gary Rosenberg, Dept. of Geology, Indiana University–Purdue University, 723 W. Michigan St., Indianapolis, IN 46202-5191, USA, +1-317-274-7468, fax +1-317-274-7966, grosenbe@iupui.edu; Sally Newcomb. Max.: 30; min.: 5. Cost: US$79 (L, R, vans).

A day-tour behind the scenes at the American Philosophical Society (APS), the Library Company, and the Academy of Natural Sciences. The APS is America's first learned society, founded by Benjamin Franklin in 1743 for the pursuit of "all philosophical Experiments that let Light into the Nature of Things." The Library Company was founded in 1731 by Franklin and his colleagues, with the motto, "To pour forth benefits for the common good is divine." The Academy is the oldest natural sciences institution in the Western Hemisphere, founded in 1812 by artist and inventor Charles Willson Peale "for the encouragement and cultivation of the sciences." Among the highlights: Thomas Jefferson's fossil collection; William Parker Foulke's papers on America's first dinosaur, Hadrosaurus; the rediscovered copy of Nicholas Steno's first publication, *De Thermis*; Konrad Gesner's *De rerum fossilium*; and William Smith's first map of the geology of England.

3. Buried Holocene Streams and Legacy Sediment: Late Pleistocene to Historical Changes in Stream Form and Process and Implications for Stream Restoration, Mid-Atlantic Piedmont Region [403]

Sat., 21 Oct. Dorothy Merritts, Dept. of Earth & Environment, Franklin and Marshall College, P.O. Box 3003, Lancaster, PA 17604-3003, USA, +1-717-291-4398, fax +1-717-291-4186, Dorothy.merritts@fandm.edu; Robert Walter; Ward Oberholtzer. Max.: 35; min.: 10. Cost: US$89 (L, R, bus).

A one-day trip centered in beautiful Lancaster County to observe examples of the depositional and erosion record of Piedmont stream channel changes over the past 300 years revealed in natural and artificial exposures. The historic record of channel form and process will be used to showcase examples of successful stream restoration techniques. Includes one stop in Valley Forge National Park to observe an in-progress restoration project.

4. Coastal Hydrology and Processes of Atlantic Barrier Islands [404]

Sat., 21 Oct. Rip Kirby, Coastal Research Lab, University of South Florida, 4202 E. Fowler Ave., SCA520, Tampa, FL 33620, USA, +1-850-217-1616, jkirby@mail.usf.edu. Max.: 24; min.: 10. Cost: US$89 (B, R, vans).

Roundtrip travel to Cape May, New Jersey, and the Atlantic barrier islands on the New Jersey shore with presentations and discovery in the field. The field trip is arranged to explore by boat during the morning high tide the estuarine hydrologic and tidal processes surrounding Cape May that affect the flux of sediment seaward to the barrier island coastlines.

5. Effects of Metasomatism and Fusion of Host Rock on the Chemistry of Early Jurassic Palisades Diabase in the Newark Basin [405]

Sat., 21 Oct. Alan Benimoff, Dept. of Engineering Science & Physics, City University of New York, College of Staten Island, 2800 Victory Blvd., Staten Island, NY 10314-6609, USA, +1-718-982-2835, fax +1-718-892-2830, benimoff@mailcsi.cuny.edu; John Puffer. Max.: 12; min.: 6. Cost: US$129 (L, R, vans).

Our field trip will offer an examination of sites where fusion of host rock has occurred below and within the Palisades sill and a comagmatic intrusion at Laurel Hill. The effects of metasomatic exchange reactions will be observed at contacts between sodic hornfels and Palisades diabase. In general, the intermediate-Ti (ITi) basalt population of early Jurassic Central Atlantic Magmatic Province continental flood basalt is remarkably homogenous. However, important new data indicates that significant and widespread contamination of ITi magma has occurred due to two different processes (metasomatism and fusion). Metasomatism near the contacts of a major ITi intrusion (the Palisades sill) has resulted in K_2O enrichment and Na_2O depletion of the chill zone compared with extrusive comagmatic ITi basalt (Orange Mountain Basalt). Fusion of xenoliths of country rock together with some magma mixing best explain the chemistry of some diabase layers within the Palisades sill that have been interpreted as the result of extreme fractionation. When the chemical composition of host rock hornfels is compared with these diabase layers, similar compositions are seen. Fusion of xenoliths is offered as a simplified mechanism in explaining the composition of these anomalous layers.

6. Journey into Anthracite [406]

Sat., 21 Oct. Aaron R. Frantz, CDM, One Cambridge Place, 50 Hampshire Street, Cambridge, MA 02139, USA, +1-610-293-0450, frantzar@cdm.com; Ed Simpson; Dale Freudenberger. Max.: 33; min.: 12. Cost: US$69 (L, R, vans).

Three transects into the Southern Anthracite field will be made on this trip. The first and second transects will begin at the Mauch Chunk Formation, extend through the Pottsville Formation, and end at the Llewellyn Formation. These two transects will be made at Pottsville and Tamaqua, Pennsylvania, respectively. The third transect will be into the Llewellyn Formation at the renovated Number 9 Coal Mine in Lansford, Pennsylvania. The mine tour will transport participants 1600 ft into the subsurface; a 900-ft-deep mine shaft, among other features, will be viewed during the tour.

7. Lacustrine Cyclicity and the Triassic-Jurassic Transition [407]

Fri.–Sat., 20–21 Oct. Cosponsored by *GSA Sedimentary Geology Division; GSA Limnogeology Division*. Paul Olsen, Lamont-Doherty Earth Observatory, Columbia University, P.O. Box 1000, 61 Route 9W, Palisades, NY 10964-1000, USA +1-845-365-8491, fax +1-845-365-8163, polsen@ldeo.columbia.edu; Jessica Whiteside. Max.: 40; min.: 5. Cost: US$245 (2L, R, ON bus).

Combined field trip and workshop to the Newark basin of Pennsylvania to observe the Triassic-Jurassic mass-extinction level within the context of the famous Milankovitch cyclicity of the Newark Supergroup and explore the lacustrine facies in a modern limnological context.

8. Late Pleistocene to Modern Lacustrine Processes and Paleoclimatic History in the Finger Lakes, New York [408]

Fri.–Sat., 20–21 Oct. Cosponsored by *GSA Sedimentary Geology Division; GSA Limnogeology Division*. John Halfman, Dept. of Geosciences & Environmental Studies, Hobart and William Smith College, 4002 Scandling Ctr, Geneva, NY 14456-3322, USA, +1-315-781-3918, fax +1-315-781-3860, halfman@hws.edu; Tara Curtin; Neil Laird; Pete Knuepfer. Max.: 40; min.: 21. Cost: US$299 (2L, D, 2R, bus).

The Finger Lakes of central and western New York State provide an excellent natural laboratory to investigate modern limnological, hydrogeochemical, and sedimentological processes, to decipher records of paleoclimatic change through the Holocene, and to investigate the deglacial history of the region and its influence on the rapidly growing winery industry. This field trip will explore modern sediments and modern meteorological events that influence sedimentation patterns, look at the record of climate change preserved in the Holocene sediments, and examine evidence of the deglacial and proglacial lake history preserved within the watershed. We anticipate two excursions, one on Seneca Lake using our 65-ft research vessel to investigate modern processes with our seismic and coring equipment and the second within the watershed to investigate the record of deglaciation and its influence on the winery industry. A gathering during the evening will provide an opportunity to discuss modern limnological, hydrogeochemical, and meteorological events and the paleoclimatic history preserved in the lake sediments.

9. New Insights to an Old Fold-Thrust Belt [409]

Fri.–Sat., 20–21 Oct. Steven Wojtal, Dept. of Geology, Oberlin College, 52 W. Lorain St., Oberlin, OH 44074-1044, USA, +1-440-775-8352, fax +1-440-775-8038, steven.wojtal@oberlin.edu; Patricia Campbell; Tom Anderson. Max.: 30; min.: 15. Cost: US$185 (2L, 2R, ON, vans).

In western Maryland (and adjacent Pennsylvania and West Virginia), Paleozoic strata were detached from underlying Grenville basement and transported to the north and west during the Alleghanian orogeny. Recent structural studies in the Blue Ridge and Valley and Ridge Provinces in Pennsylvania, Maryland, and West Virginia provide insight into the kinematics of deformation in this classic transect across the Appalachian fold-thrust belt. This trip will examine evidence for an early detachment near the base of the Paleozoic strata, now exposed in the NW-dipping limb of the major South Mountain anticline. Farther to the west, we will examine suites of minor structures in deformed cover strata, including sites like the classic Roundtop exposures near Hancock, Maryland, and the Sideling Hill syncline, that (1) contain evidence for an early deformation consisting of layer-parallel shortening and shearing along a NNW axis, and (2) later macroscopic folding and thrusting along a WNW axis. Strain analyses in these strata indicate that both deformation stages are required to match the total shortening estimated within the lower Paleozoic duplexes.

10. Plant Paleoecology and Geology of the Southern Anthracite Field, Pennsylvania [410]

Fri., 20 Oct., Hermann Pfefferkorn, Dept. of Earth & Environment Science, University of Pennsylvania, 240 S. 33rd St., Philadelphia, PA 19104-6316, USA, +1-215-898-5156, fax +1-215-898-0964, hpfeffer@sas.upenn.edu; Rudy Slingerland; William Kochanov. Max.: 44; min.: 17. Cost: US$69 (L, R, bus).

The Southern Anthracite Field is a classic area for paleobotany and Carboniferous stratigraphy that is very unusual in many respects. Plant fossils are preserved in anchimetamorphic rocks and are often replaced by the white mineral pyrophyllite. The plants occur predominantly in the bottom rock ("underclay") of coal seams rather than in the roof shale. Paleosols occur throughout the section, formed under widely different conditions at different times. The stratigraphic sections are largely continuous in spite of intense tectonism. This field trip will visit the classic Pottsville section that shows >1 km of section in slightly overturned, near vertical position. Late Mississippian through early Late Pennsylvanian stratigraphy, biostratigraphy, sedimentology, paleoclimatology, coal geology, paleosols, rooting structures, and plant fossils will be seen and discussed. The famous St. Clair locality will be visited, which is otherwise inaccessible.

11. Prehistoric and Urban Landscapes of the Middle Atlantic Region: Geoarchaeological Perspectives [411]

Sat., 21 Oct. Cosponsored by *GSA Archaeological Division.* Joseph Schuldenrein, Geoarcheology Research Associates, 5912 Spencer Ave, Riverdale, NY 10471, USA, +1-718-601-3861, fax +1-718-601-3864, geoarch@aol.com. Max.: 50; min.: 30. Cost: US$85 (L, R, bus).

Contemporary and buried landscapes of the urban Northeast preserve evidence of complex land use and sedimentation patterns in conjunction with Holocene and historic human occupation. While industrialization and development has destroyed much of the pristine surfaces and landscapes, geoarchaeological investigations over the past 20 years have produced reconstructions of the landscape history that are tied to changing settlement and land utilization. This trip will sample a variety of the geoarchaeological environments that have been investigated as a result of historic preservation projects. The trip will begin in Philadelphia and extend northward up and across the Delaware Valley, spanning the margins of the Woodfordian glacial boundary, and it may extend as far north as northern New Jersey or even New York City.

12. Refining the Metamorphic and Tectonic History of the Southeastern Pennsylvania Piedmont: Recent Results from Monazite and Zircon Geochronology and Accessory-Phase Thermometry [412]

Fri.–Sat., 20–21 Oct. Joe Pyle, Rensselaer Polytechnic Institute, 110 8th St., Troy, NY 12180-3522, USA, +1-518-276-4899, fax +1-518-276-2012, pylej@rpi.edu; Hal Bosbyshell; Gale Blackmer. Max.: 25; min.: 7. Cost: US$245 (B, 2L, D, 2R, ON, vans).

This field trip crosses the metamorphic core of the SE Pennsylvania Piedmont, from the Mesoproterozoic Honey Brook Upland (Northern Chester County) to the Ordovician Wilmington Complex (Pennsylvania-Delaware state line). The effects of Proterozoic and Paleozoic orogenic events on the SE Pennsylvania Piedmont are discussed in the context of recent results from monazite and zircon geochronology plus accessory-phase thermometry. Trip stops emphasize: (i) *T-t* history of Grenvillian and Late Paleozoic orogenesis in the Honey Brook Upland; (ii) contrasts in internal (Laurentian) and external (non-Laurentian?) basement massifs of the SE Pennsylvania Piedmont; (iii) age and *P-T* differences in Paleozoic metasediments of the Chester Valley Sequence versus the Wissahickon Schist; (iv) magmatism in the Wilmington Complex; and (v) the extent and significance of Barrovian Devonian metamorphism overprinting earlier Ordovician and Silurian Buchan metamorphism in the Wissahickon Schist.

13. Rivers, Glaciers, Landscape Evolution, and Active Tectonics of the Central Appalachians, Pennsylvania and Maryland [413]

Wed.–Sat., 18–21 Oct. Cosponsored by *GSA Quaternary Geology and Geomorphology Division.* Frank Pazzaglia, Dept. of Earth & Environmental Sciences, Lehigh University, 31 Williams Dr., Bethlehem, PA 18015-3126, USA, +1-610-758-3667, fax +1-610-838-2344, fjp3@lehigh.edu; Duane Braun; Noel Potter; Dru Germanoski; Milan Pavich; Paul Bierman; Dorothy Merritts; Allen Gellis. Max.: 30; min.: 15. Cost: US$375 (3B, 3L, 2D, 3ON, vans). *Begins in Washington, D.C. Participants will be advised on arrival options.*

This trip will travel from the Great Falls of the Potomac to the head of Chesapeake Bay and up the Susquehanna River to the glacial boundary in north-central Pennsylvania, exploring the geologic and geomorphic record of late Cenozoic landscape evolution. The trip will emphasize what new research tells us about erosion, river incision, rock-uplift, and the pace of landscape change for the Appalachians over both geologic and human time scales.

14. Rodinian Collisional and Escape Tectonics in the Hudson Highlands, New York [414]

Thurs.–Sat. 19–21 Oct. Cosponsored by *Highlands Environment Research Institute*. Alexander Gates, Dept. of Earth & Environmental Sciences, Rutgers State University, Newark, NJ 07102-1811, USA, +1-973-353-5034, fax +1-973-353-1965, agates@andromeda.rutgers.edu; David Valentino; Mathew Gorring. Max.: 30; min.: 8. Cost: US$245 (2L, 2D, R, 2ON, vans).

A new multidisciplinary research collaboration (under the Highlands Environmental Research Institute) to study the western Hudson Highlands, New York, has unraveled a complex Rodinian tectonic history. This field trip will visit key locations to illustrate this history. New sensitive high-resolution ion microprobe data demonstrate a cryptic suture between a ca. 1.2–1.1 Ga island arc and sedimentary rocks from a deeply incised craton (Amazonia?). The 1.05 Ga collision between these two terranes produced westward-directed fold nappes, granulite facies metamorphism, and the dominant subhorizontal gneissic foliation. Tectonic surge granite sheets were emplaced into the nappes. Bimodal (diorite and granite) plutons intruded the area prior to the onset of a steeply dipping 35-km-wide dextral shear system that resulted from tectonic escape. Extensive iron remobilization and mineralization accompanied the shearing, and post-kinematic pegmatite plutons mark the end of activity ca. 980 Ma.

15. Stratigraphy and Paleontology of the Chesapeake Group [415]

Wed.–Sat., 18–21 Oct. Luack Ward, Virginia Natural History Museum, 1001 Douglas Ave, Martinsville, VA 24112-4717, USA, +1-276-666-8628, fax +1-276-666-8624, lwward@vmnh.net; Alton C. Dooley Jr., Max.: 20; min.: 5. Cost: US$275 (L, D, 2R, 2ON, vans).

This trip will examine the Calvert, Choptank, and St. Marys Formations along the world-class exposures at Calvert Cliffs. An overnight stay at Westmorland State Park will be followed by examination of the Eastover and Yorktown formations along the James River.

16. Stratigraphy of the Cambrian and Lower Ordovician Carbonates of the Kittatinny Supergroup, Northwestern New Jersey: Special Attention to the Nature and Timing of Silica Diagenesis and the Origin of Nodular Cherts [416]

Fri.–Sat., 20–21 Oct. Philip C. LaPorta, City University of New York and LaPorta Associates, 116 Bellvale Lakes Rd., Warwick, NY 10990-3402, USA, +1-845-986-7733, fax +1-845-988-9988, plaporta@laportageol.com; Margaret Brewer; Scott Minchak. Max.: 12; min.: 6. Cost: US$199 (2L, 2R, ON, vans).

This field trip will focus on the Kittatinny Supergroup, the expression of the Great Valley Sequence in northwestern New Jersey. The Kittatinny Supergroup contains the Cambrian Leithsville, Limeport, and Upper Allentown Formations and the Lower Ordovician Stonehenge, Rickenbach, Epler, and Ontelaunee Formations. Stratigraphic details of the carbonate lithologies will be examined with a focus on the interpretation of depositional environments and the mechanisms and timing of silicification events. Particular attention will be paid to the origin of nodular cherts, silica sources, replacement mechanisms, and usefulness of the cherts as geologic mapping aids. The terrain we will be visiting is moderate; hiking boots are recommended. The weather in October is cool (30 to 50 °F) and possibly rainy; therefore, layered, warm clothing and rain gear are needed.

17. Taconic Orogeny in the Susquehanna Shelf and Foreland [417]

Fri.–Sat., 20–21 Oct. Don Wise, Dept. of Geosciences, University of Massachusetts, Amherst, MA 01003, USA, +1-413-545-0482, fax +1-717-291-4186, dwise@geo.umass.edu; Bob Ganis. Max.: 45; min.: 20. Cost: US$199 (B, 2L, D, R, ON, bus).

This trip examines structures involved in the mostly Ordovician shelf and foreland evolution of a cross section of the Pennsylvania Piedmont. The first day focuses on collapse, thrusting, multiple deformation, and cleavage development near the shelf edge. The second day incorporates many new graptolite dates on progressive emplacement of major allochthons into the Martinsburg and Cocalico Formations and their subsequent infolding with carbonates into vast recumbent folds and nappes of the foreland. The trip visits some famous localities, including the Martic Front, Chickies Rock, Rheems Quarry, and the Hamburg (former) Klippe.

18. Tectonic History of the Blue Ridge, North-Central Virginia [418]

Thurs.–Sat., 19–21 Oct. Christopher (Chuck) Bailey, College of William and Mary, Williamsburg, VA 23187-8795, USA, +1-757-221-2445, cmbail@wm.edu; Scott Southworth; Richard Tollo. Max.: 32; min.: 12. Cost: US$285 (2B, 3L, D, 3R, 2ON, vans).

The Virginia Blue Ridge records a long tectonic history that encompasses the Mesoproterozoic Grenvillian orogen, Neoproterozoic Iapetan extension, Paleozoic ductile and brittle contractional structures, as well as subtle Mesozoic structures. This trip will traverse the Blue Ridge from east to west and includes stops along the scenic Skyline Drive in Shenandoah National Park and in the Shenandoah Valley.

19. The Great Centralia Mine Fire: A Natural Laboratory for the Study of Coal Fires [419]

Sat., 21 Oct. Glenn Stracher, Div. of Science & Mathematics, East Georgia College, 131 College Cir., Swainsboro, GA 30401-3643, USA, +1-478-289-2073, fax +1-478-289-2050, stracher@ega.edu; Melissa Nolter; Daniel H. Vice; Janet L. Stracher. Max.: 45; min.: 12. Cost: US$95 (L, D, R, bus).

We will travel to the famous Centralia Mine Fire in the central Appalachian Mountains of eastern Pennsylvania, where we will discuss the coal stratigraphy and structural geology of the Western Middle coalfield as well as the origin, history, and socio-political-economic impact of the mine fire. Trip participants will see spectacular subsidence features, anthracite smokers (gas vents), and ground fissures associated with underground burning in abandoned coal-mine tunnels. Field techniques for collecting the mineral by-products of coal combustion and for collecting microarthropods from vegetation adjacent to gas vents and fissures will be demonstrated. Gas collection techniques using stainless steel gas canisters, a hand-operated sampler, and Tedlar gas bags will also be demonstrated as will in situ field analysis of select coal gas components using Drager tubes. An interview with one of the few remaining residents of Centralia is planned. Participants should be prepared for light hiking and possible inclement weather. People interested in coal stratigraphy, coal mining, and coal fires will enjoy this trip.

DURING THE MEETING

20. 135 Million Years of History in Southwestern Philadelphia [420]

Sun., 22 Oct. Raymond A. Scheinfeld., Weston Solutions Inc., 1 Weston Way, West Chester, PA 19380-1469, USA, +1-215-841-2019, ray.scheinfeld@westonsolutions.com. Max.: 30; min.: 10. Cost: US$59 (R, vans).

This field trip will showcase the geologic history of the area adjacent to the Philadelphia International Airport. A thick sequence (150+ ft) of Cretaceous age Potomac Group and sediments, unconformably overlain by Quaternary Trenton Gravel and Alluvial silts and clays were investigated as part of the construction planning for a new 5000-ft-long runway (Runway 8-26) over a deleted but deed-restricted U.S. Environmental Protection Agency Superfund site. Trip participants will be able to examine extensive core samples taken during the investigation that illustrate the stratigraphic and hydrogeologic framework of the area. These data were used to overcome numerous engineering design, environmental, and construction challenges during runway development. The trip will visit the groundwater mitigation system installed to address a newly identified contamination plume at the site as well as examine the construction features of the runway. The field trip will also participate in a guided tour of historic Fort Mifflin, the oldest fortification continually used in the United States.

21. Bicycle Tour of the Geology and Hydrology of Philadelphia [421]

Tues., 24 Oct., Raymond A. Scheinfeld, Weston Solutions, 1 Weston Way, West Chester, PA 19380-1469, USA, +1-215-841-2019, ray.scheinfeld@westonsolutions.com. Max.: 25; min.: 5. Cost w/bike rental: US$55. Cost w/o bike rental: US$25 (R, bikes).

Unwind after attending sessions at the conference with this leisurely, geologically oriented bicycle-based field trip along the beautiful and scenic banks of the Schuylkill River and Wissahickon Creek in Philadelphia. The trip will start at the Philadelphia Museum of Art and extend to Valley Green in the Wissahickon Gorge. Cyclists will visit a series of locations that illustrate the complex Paleozoic geology of this area as well as the hydrologic and cultural features that shaped over 300 years of development of what was at one time the center of science, culture, and industry in the United States. The trip will proceed at a pace of 9–12 mi/hr with frequent stops. The entire trip will cover a distance of 18–20 miles, and there will be several opportunities to shorten the trip if desired. The terrain is generally level with a few small (<100 ft) elevation changes. The entire trip is on paved or well-graded gravel bicycle trails. Participants may bring their own bicycles (wide-tired bicycles are best) or may rent bicycles at a location near the start of the trip. Helmets are required for the trip. Trip rain date is the following day.

22. Erosion and the Hickory Run Boulder Field—1st Annual Kirk Bryan Field Seminar [422]

Tues., 24 Oct. Cosponsored by *GSA Quaternary Geology and Geomorphology Division.* Frank Pazzaglia, Dept. of Earth & Environmental Sciences, Lehigh University, 31 Williams Dr., Bethlehem, PA 18015-3126, +1-610-758-3667, fax +1-610-838-2344, fjp3@lehigh.edu; Paul Nierman; Milan Pavich; Dorothy Merritts. Max.: 60; min.: 20. Cost: US$59 (B, L, vans).

This is a one-day linked field trip and seminar to explore recent advances in the quantification of the rates and processes of erosion. The Hickory Run Boulder Field will stand as a thought-provoking backdrop, stimulating conversation on modern and relict processes and landscapes. The trip is designed to complement the Pardee symposium on erosion (P1).

23. Geology of Delaware Water Gap, New Jersey–Pennsylvania [423]

Wed., 25 Oct. Jack Epstein, U.S. Geological Survey, 926-A National Ctr., Reston, VA 20192-0001, USA, +1-703-648-6944, fax +1-703-648-6953, jepstein@usgs.gov; Tim Connors; Denise Cooke-Bauer; Rab Cika. Max.: 40; min.: 15. Cost: US$89 (L, bus).

This one-day trip is meant especially for earth science teachers. It will consist of an overview stop discussing the stratigraphy, structure, geomorphology, and glacial geology of the Delaware Water Gap National Recreation Area and a hike to the top of Kittatinny Mountain to view the abundant geologic features.

24. Philadelphia Urban Hydrology [424]

Wed., 25 Oct. Laura Toran, Dept. of Geology, Temple University, Philadelphia, PA 19122, USA, +1-215-204-2352, fax +1-215-204-3496, ltoran@temple.edu; Chris Crockett. Max.: 45; min.: 5. Cost: US$45 (L, R, bus).

Although America's great industrial centers rose from the banks of rivers that provided cheap power and transportation, Philadelphia was the first large American city to regard the delivery of safe water as a municipal responsibility. This tour of the historic Philadelphia waterworks will highlight some of the earliest hydrologic planning in the United States.

POSTMEETING

25. A Tour of the Peach Bottom Slate—Once the Best Building Slate in the World [425]

Thurs., 26 Oct. Jeri Jones, Jones Geological Services, 276 N. Main St., Spring Grove, PA 17362-1127, USA, +1-717-225-3744, fax +1-717-840-7403, JLJ276@aol.com; Mary Ann Schlegel; Charles Scharnberger; Donald Robinson. Max.: 24; min.: 12. Cost: US$69 (L, R, vans).

This trip to southern Lancaster and York County, Pennsylvania, will look at the mining heritage of the Peach Bottom Slate. This slate was voted the best building slate in the world in 1850 and has been used in such buildings as the Biltmore Mansion in Asheville, North Carolina, and state and federal buildings. Through citizen efforts, this heritage has been well preserved. Stops will include the contact between the Cardiff Conglomerate and Peach Bottom Slate; the Old Line Museum in Delta, including the world famous Slate Clock; the Funkhauser Quarry; the Slateville Presbyterian Church cemetery; the Welsh village of Coulsontown; and the Cardiff Serpentinite "Green Marble" quarry.

26. Arsenic in Groundwater in the Newark Basin [426]
Thurs., 26 Oct. Cosponsored by *GSA Sedimentary Geology Division; GSA Geology and Health Division*. Mike Serfes, New Jersey Geological Survey, P.O. Box 427, Trenton, NJ 08625-0427, USA, +1-609-984-6587, mike.serfes@dep.state.nj.us; Steve Spayd; Paul Olsen. Max.: 40; min.: 10. Cost: US$59 (L, R, bus).

Arsenic concentrations of up to 215 µg/L in groundwater have been measured in the Newark basin in New Jersey. This trip will summarize the findings of past and ongoing research related to the sources, occurrence, mobilization (including microbial-aided), transport, and treatment of arsenic in groundwater in the basin.

27. Central Appalachian Transect along the Potomac River Corridor [427]
Thurs.–Fri., 26–27 Oct. Scott Southworth, U.S. Geological Survey, 1500 Hampton Hill Circle, Reston, VA 20192, USA, +1-703-648-6385, ssouthwo@usgs.gov; Robert Wintsch; Michael Kunk. Max.: 24; min.: 5. Cost: US$259 (2L, 2R, ON, vans).

Rocks exposed along the Potomac River corridor of Washington, D.C., Maryland, Virginia, and West Virginia record Mesoproterozoic, Neoproterozoic, Paleozoic (Ordovician-Silurian-Devonian-Mississippian-Pennsylvania-Permian), and Mesozoic tectonic events related to the formation and destruction of several Wilson Cycles of opening and closing oceans. This field trip will examine rocks from the eastern Piedmont and west across the Blue Ridge–South Mountain anticlinorium. New $^{40}Ar/^{39}Ar$, U-Pb, and fission-track data of the region refine our understanding of the timing of plutonism, deformation, and metamorphism of the Grenvillian, Taconian, Acadian, and Alleghanian orogenies, Mesozoic extension, and Cenozoic contractional faulting affecting the rocks of the region. We will emphasize new data on the Paleozoic amalgamation of the metamorphic rocks of the Piedmont and Blue Ridge provinces and the regional faults (Rock Creek, Plummers Island, Pleasant Grove, Martic fault, Short Hill–South Mountain, and North Mountain).

Angular unconformity, Catskill, New York. Steeply dipping Ordovician shales below moderately tilted Silurian dolomite. This unconformity represents two mountain-building events in the Appalachians: the Taconic event tilted the underlying shale; the later Alleghenian event tilted everything. Photo by Marli Miller.

28. Environmental Issues Associated with Sulfide Occurrences in Pennsylvania [428]
Wed.–Fri., 25–27 Oct. Ryan Mathur, Dept. of Geology, Juniata College, 1700 Moore St., Huntingdon, PA 16652-2119, USA, +1-814-641-3725; David P. Gold, dpgold33@adelphia.net; Ryan Mather; Arnold Doden; Larry Mutti. Max.: 45; min.: 25. Cost: US$225 (B, 2L, 2ON, bus).

We will visit outcrops containing epigenetic and syngenetic pyrite (along with other sulfide minerals) in Paleozoic rocks between Lewistown and State College. The leaders will discuss how mineralization may have occurred and the current problems of and possible resolutions for these acid-generating rocks.

29. From the K-T to the Coast: Paleontology, Stratigraphy, and Coastal Sedimentation from the Late Cretaceous through the Quaternary, Southern New Jersey [429]
Thurs., 26 Oct. William Gallagher, New Jersey State Museum, 205 West State St., CN530, Trenton, NJ 08625-0530, USA, +1-609-292-6330, william.gallagher@sos.state.nj.us; Ken Lacovara. Max.: 45; min.: 25. Cost: US$69 (L, bus).

This trip will make a stop at the Inversand Pit in the New Jersey Coastal Plain where the K-T boundary and Late Cretaceous, Tertiary, and Quaternary deposits are exposed. The trip will then work its way out to the New Jersey shore, visiting several Pleistocene and Holocene strand lines along the way.

30. Geologic, Hydrogeologic, and Biogeochemical Controls on Natural and Enhanced Degradation of Industrial Solvents in Fractured Rocks [430]
Thurs., 26 Oct., Dan Goode, U.S. Geological Survey, 770 Pennsylvania Dr. #116, Exton, PA 19341-1186, USA, +1-717-571-8783, djgoode@usgs.gov; Claire Tiedeman. Max.: 60; min.: 20. Cost: US$65 (L,R, bus).

This trip will entail field examination of geologic conditions and investigative techniques for understanding degradation in fractured sedimentary rocks of the Newark Basin, using the local geology in West Trenton, New Jersey, from outcrop and a core from the former Naval Air Warfare Center (NAWC). Planned field demonstrations at the NAWC include surface geophysics (new rapid-deployment tools); borehole geophysics (with emphasis on detailed correlation using lithology and gamma); water levels and flow directions during pump and treat in highly heterogeneous formations characterized by bed-limited permeability; cross-hole flowmeter testing; monitoring of biogeochemical conditions using packers; diffusion and long-term grab samplers downhole; and monitoring bacteria, substrate, and contaminant concentrations during the Navy's biostimulation and bioaugmentation program.

31. History and Geology of Gettysburg National Battlefield [431]

Thurs., 26 Oct. Roger Cuffey, Dept. of Geosciences, Pennsylvania State University, 412 Deike Bldg., University Park, PA 16802-2713, USA, +1- 814-865-1293, fax +1-814-863-8724, cuffey@ems.psu.edu; Jon Inners. Max.: 42; min.: 15. Cost: US$95 (R, bus).

Enjoy a full-day tour of America's Most Hallowed Ground lead by geologists who are also historians of the Civil War. The tour begins at the railroad cut on McPherson's Ridge, moves to Cemetery Ridge, then concludes on the Roundtops and Seminary Ridge. Visits to the observation tower and visitor's center (under construction) and town are also planned.

32. Karst and Environmental Hydrology in Central Pennsylvania [432]

Wed.–Fri., 25–27 Oct. Richard Parizek, Pennsylvania State University, 751 Mckee St., State College, PA 16803-3631, USA, +1-814-865-3012, fax +1-814-238-5261, parizek@ems.psu.edu. Max.: 45; min.: 10. Cost: US$295 (3B, 3L, 3D, 2ON, vans).

This trip begins and ends in Philadelphia, with a wide loop through central Pennsylvania visiting outstanding examples of the region's Quaternary geology, karst hydrology, environmental geology, and hydro-engineering solutions to the problems presented by a growing population.

33. Paleontology and Paleoenvironments of the Upper Devonian Catskill Formation in North-Central Pennsylvania [433]

Thurs.–Fri., 26–27 Oct. Ted Daeschler, Academy of Natural Science, 1900 Parkway, Philadelphia, PA 19103-1101, USA, +1-215-299-1133, fax +1-215-299-1028, daeschler@acnatsci.org; Walt Cressler. Max.: 27; min.: 12. Cost: US$175 (B, 2L, D, ON, vans).

This two-day trip will explore the Catskill Formation in a series of road cut exposures. Stops include the Red Hill locality, source of abundant plant, arthropod, and vertebrate fossils, including the oldest tetrapods from North America, and several additional outcrops along the I-99 corridor.

34. Prehistoric Quarries and Early Mines in the New York–New Jersey–Pennsylvania Tri-State Metropolitan Area [434]

Thurs.–Sat., 26–28 Oct. Cosponsored by *GSA Archaeological Geology Division.* Philip C. LaPorta, City University of New York and LaPorta Associates, 116 Bellvale Lakes Rd., Warwick, NY 10990-3402, USA, +1-845-986-7733, fax +1-845-988-9988, plaporta@laportageol.com; Margaret Brewer; Scott Minchak. Max.: 12; min.: 6. Cost: US$299 (3L, 3R, 2ON, vans).

This field trip is a first-ever visit for the archaeological and geological research community of prehistoric quarries in the metropolitan tri-state area. Prehistoric quarries and prehistoric mining technology in the Central Appalachians will be introduced to researchers. The field trip will visit Late Proterozoic–Early Cambrian jasper, Cambrian, Ordovician, and Devonian nodular chert, Ordovician quartz vein and steatite, Middle Ordovician bedded radiolarian, and Triassic argillite quarries. The focus of the trip will be on geological variables that promote the development of prehistoric Native American quarries and mines. Special attention will be paid to the ingenuity of mining extraction technology in quarries ranging in age from the Paleoindian Period to the Late Woodland. The terrain is moderate; hiking boots are recommended. The weather in October is cool (30 to 50 °F) and possibly rainy; therefore, layered, warm clothing and rain gear are needed.

Philadelphia 2006 Short Courses

GSA-SPONSORED SHORT COURSES

GSA-sponsored professional development short courses will be held immediately before and during the annual meeting and are open to members and nonmembers. If you register *only* for a short course, you must pay a US$40 nonregistrant fee in addition to the course fee. This fee may be applied toward meeting registration if you decide to attend the meeting. Excepted from this requirement are GSA K–12 Teacher Members, who need only pay the short course fee if not attending the entire meeting. Early registration is recommended; standard registration (after 18 Sept.) is an additional US$30. A special Subaru of America grant is available to Pennsylvania graduate students and two-year college faculty that will cover half of the meeting registration fee. Go to www.geosociety.org/meetings/2006/rSubaru.htm for more information on this grant.

Cancellation Deadline: 19 Sept. 2006

Continuing Education Unit (CEU) Service

All professional development courses and workshops sponsored by GSA offer CEUs. A CEU is made up of 10 contact hours of participation in an organized continuing education experience under responsible sponsorship, capable direction, and qualified instruction. A contact hour is defined as a typical 60-minute classroom instructional session or its equivalent; ten instructional hours are required for one CEU.

1. Beyond the Content: Teaching Scientific and Citizenship Literacies in the Geosciences [501]

Sat., 21 Oct., 9 a.m.–5 p.m. Cosponsored by *GSA Geoscience Education Division*

Have you, as an earth science instructor, been restricted in the complexity of the course material you can present by students' limited basic skills? This workshop focuses on successful and innovative techniques for incorporating the review of scientific and citizenship literacy into introductory and junior-level university earth science courses, without compromising content.

Faculty: Erin Campbell-Stone, Ph.D.; James D. Myers, Ph.D.; both with the Department of Geology and Geophysics, University of Wyoming. Limit: 60. Fee: US$200; includes course materials and lunch. CEU: 0.7.

2. Using GPS Data to Study Crustal Deformation, Earthquakes, and Volcanism: A Workshop for College Faculty [502]

Sun., 22 Oct., 7:30 a.m.–12:30 p.m.

Cosponsored by *GSA Geoscience Education Division*

This course is geared toward faculty at two- and four-year institutions who teach general education or introductory or lower level geoscience courses in which plate tectonics is a topic. Faculty will be introduced to place-based, data-rich educational materials about global positioning systems (GPS) and plate tectonics to use in their classrooms, receive an introduction to high-precision GPS, and have the opportunity to discuss pedagogical strategies for classroom implementation. Anticipated topics include slow earthquakes in Cascadia and monitoring volcano deformation. Although individuals with GPS experience are welcome, knowledge of GPS is not required. **Participants should bring a laptop computer with wireless Internet capability.**

Faculty: Susan Eriksson, Ph.D.; Becca Walker; David Phillips, Ph.D.; all with UNAVCO. Limit: 20. Fee: US$160; includes course materials and refreshments. CEU: 0.5.

3. Digital Terrain Mapping [503]

Sat., 21 Oct., 8 a.m.–5 p.m.

Cosponsored by *GSA Engineering Geology Division; GSA Quaternary Geology and Geomorphology Division*

Hands-on introduction to digital elevation models (DEMs), triangulated irregular networks (TINs), and xyz(i) point clouds to visualize and analyze topography. Conventional, radar, and LIDAR elevation data; geodetic datum and coordinate systems; interpolation; derivative maps; effects of errors; image processing tools; and geologic process models. No previous terrain modeling experience required. **Participants are asked to bring a laptop computer (Macintosh OS X, Windows, Linux) with wireless capabilities and pre-installed free software (instructions provided) to participate in the computer exercises.**

Faculty: William C. Haneberg, Ph.D., consulting geologist, www.haneberg.com. Limit: 50. Fee: US$240; includes course materials and refreshments. CEU: 0.8.

4. Enhanced Seismology Education for Undergraduates [504]

Sat., 21 Oct., 8 a.m.–5 p.m.

Cosponsored by *GSA Geoscience Education Division*

This workshop is intended for faculty at 2- and 4-year colleges and universities who wish to learn both new seismology content and instructional strategies to effectively convey content to students. Seismology topics will include "hot topics," causes of earthquakes, propagation of seismic waves, statistics and data, Earth's structure, and hazards. Educational topics will feature instructional sequences, student conceptions in geoscience, and constructivist learning theory. Effective science instruction will be modeled by emphasizing hands-on and inquiry-based activities to deliver content to learners.

Faculty: Jeff Barker, Ph.D., Binghamton University; Michael Hubenthal, IRIS Consortium; Tom Owens, Ph.D., University of South Carolina; John Taber, Ph.D., IRIS Consortium. Limit: 25. Fee: US$15; includes course materials and lunch. CEU: 0.8.

5. Scientific Inquiry in the K–16 Classroom: What Every Scientist Should Know about Effective Science Education [505]

Sat., 21 Oct., 8 a.m.–noon

Cosponsored by *GSA Geoscience Education Division*

This course provides research-based and hands-on experiences with scientific inquiry in school classrooms. Inquiry is both a content area—the understanding of how science works that every student needs to become a science-literate citizen—and a set of teaching and learning strategies that replicates the

discovery process of science in teaching students the big ideas of science. This course is designed for scientists and science educators at all levels who wish to contribute to education as volunteers or in professional capacities as part of research-related outreach programs or to meet the "broader impacts" requirements of their research funders.

Faculty: Sandra Laursen, Ph.D., Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado, Boulder, Colo.; Lesley Smith, Ph.D., CIRES, University of Colorado, Boulder, Colo.; Carol Schott, M.A., Science Discovery, University of Colorado, Boulder, Colo. Limit: 50. Fee: US$145; includes course materials and refreshments. CEU: 0.4.

6. Using EarthEdOnline: Online Delivery System for Data-Rich Inquiry Education [506]

Sat., 21 Oct., 8 a.m.–5 p.m.

Cosponsored by *GSA Geoscience Education Division*

This course provides hands-on training in the use of the "EarthEdOnline" software package to deliver data-rich inquiry activities to learners at a wide range of education levels. It will cover the goals and issues involved with presenting inquiry activities, scaffolding of activities to ensure success, online peer review, and configuring EarthEd Online software. **Participants should bring a laptop computer with wireless capability.**

Faculty: William Prothero, University of California (emeritus), Santa Barbara, Calif.; Ph.D., University of California, San Diego, Calif.; Sabina Thomas, Baldwin Wallace College, Berea, Ohio; Ph.D., Technical University of Berlin. Limit: 20. Fee: US$200; includes course materials and refreshments. CEU: 0.8.

7. Education Research: An In-Depth Look at Qualitative Methods [507]

Sat., 21 Oct., 1 p.m.–5 p.m.

Cosponsored by *GSA Geoscience Education Division*

Participants will learn about qualitative data collection and analysis methods used in geoscience education research. Qualitative research involves the collection and analysis of data from sources such as interviews, classroom observations, and student writings and drawings. It is the building block of and a complement to quantitative education research. Case studies, demonstrations, and hands-on activities will introduce participants to qualitative education research. This workshop is geared for college and K–12 educators, researchers, and students who are conducting or planning education research.

Faculty: Julie Sexton, doctoral fellow, National Science Foundation Center for Learning and Teaching in the West, Colorado State University, Fort Collins, Colo., ju.sexton@colostate.edu. Limit: 55. Fee $140; includes course materials. CEU: 0.4.

8. Using Online Igneous Geochemical Databases for Research and Teaching [508]

Sat., 21 Oct., 1 p.m.–5:30 p.m.

Cosponsored by *GSA Geoscience Education Division*

This course will give students, teachers, and researchers training on geochemical database systems for igneous rocks. The course will include a variety of exercises and short lectures to explore and explain how these systems work. The course is intended to be a blend of education opportunities in the use of geochemical databases and background knowledge about geoinformatics, relational databases, and data reporting. A general knowledge of petrology is required. **Participants should bring a laptop computer with wireless capability** (if unable, please contact instructor Walker at jdwalker@ku.edu).

Faculty: Kerstin Lehnert, Ph.D., Lamont-Doherty Earth Observatory of Columbia University, Palisades, N.Y.; Kent Ratajeski, Ph.D., Department of Geosciences, University of West Georgia, Carrollton, Ga.; Doug Walker, Ph.D., Department of Geology, University of Kansas, Lawrence, Kans. Limit: 55. Fee: US$25; includes course materials and refreshments. CEU: 0.4.

9. Introduction to Geographic Information Systems (GIS) Using ArcGIS9 for Geological Applications [509]

Fri.–Sat., 20–21 Oct., 8 a.m.–5 p.m.

This short course will introduce the use of GIS in geology-related applications through brief lectures and hands-on computer exercises. Concepts in creating a GIS project in geology will be discussed, including creation of data (global position systems, remote sensing, digitizing), conversion of data, metadata, different data formats (vector and raster) and accessing data from several sources (tables, shapefiles, coverages, computer-aided drafting, geodatabases, and grids). Participants do not need to have experience with ArcGIS, but familiarity with Windows OS is beneficial.

Faculty: Ann B. Johnson, Higher Education Manager, Environmental Systems Research Institute, Redlands, Calif.; Ph.D., California State University; Willy Lunch, Instructor, Environmental Systems Research Institute, Denver, Colo.; M.S., University of Utah. Limit: 24. Fee: US$299; includes course manual and lunch. CEU: 1.6.

K–12 SHORT COURSE

GSA K–12 Teacher Members who wish to attend only the GSA short courses are not required to pay the annual meeting registration fee; for all others, annual meeting registration as well as payment of the short course fee are required for participation. Annual Meeting registration for K–12 professionals or for others who will participate only in this short course is US$40 if registered by 18 Sept. and US$45 after 18 Sept.

1. Using Authentic Scientific Ocean Drilling Data for Earth Systems Science Inquiry [601]

Sun., 22 Oct., 9 a.m.–5 p.m.

Cosponsored by *Joint Oceanographic Institutions; GSA Geoscience Education Division*

Through inquiry exercises, educators will discover how accessible and applicable scientific ocean drilling results are to the undergraduate and secondary earth systems science curricula they teach. Published data from 40 years of scientific ocean drilling expeditions can support the teaching of plate tectonics, deep time and age determination, and the history of global climate change. This is an onshore extension of the recent Joint Oceanographic Institutions (JOI) "School of Rock" Expedition (www.joilearning.org/schoolofrock).

Faculty: Kristen St. John, Ph.D., James Madison University, Harrisonburg, Virginia; Mark Leckie, Ph.D., University of Massachusetts, Amherst, Massachusetts; Leslie Peart, JOI, Washington, DC. Limit: 30. Fee: US$25; includes course materials and lunch.

OTHER COURSES

Registration and information can be obtained from the contact person listed.

Core Analysis of Lake Sediments

Sat., 21 Oct., 11 a.m.–5 p.m. GSA Limnogeology Division Workshop. Sponsored by *ExxonMobil.*

Core analysis and comparison of modern lake sediments and fossil lake rock sequences will shed light on sedimentation processes, climatic effects, and the preservation potential of fossils and structures through time and space. Please bring posters and/or cores describing your lake sediments. Posters can also be submitted for the poster session held during the annual meeting. For more information, contact Elizabeth Gierlowski-Kordesch, gierlows@ohio.edu.

Sequence Stratigraphy for Graduate Students

Fri.–Sat., 20–21 Oct., 8 a.m.–5 p.m. Cosponsored by *ExxonMobil; BP.*

This free two-day short course is designed to teach graduate students the principles, concepts, and methods of sequence stratigraphy. Sequence stratigraphy is a methodology that uses stratal surfaces to subdivide the stratigraphic record. This methodology allows for the identification of coeval facies, documents the time-transgressive nature of classic lithostratigraphic units, and provides geoscientists with an additional way to analyze and subdivide the stratigraphic record. Using exercises that utilize outcrop, core, well-log, and seismic data, the course provides hands-on experience in learning sequence stratigraphy. Exercises include classic case studies from which many sequence stratigraphic concepts were originally developed. Instructors: Art Donovan Ph.D. (Colorado School of Mines), BP (British Petroleum); Kirt Campion Ph.D., ExxonMobil Upstream Research Co. Limit: 40. No fee. Preregistration required. For information or to register, please contact art.donovan@bp.com.

Geochronology: Emerging Opportunities

Sat., 21 Oct., 8 a.m.–5 p.m. Sponsored by *The Paleontological Society.*

Study of the history of life is critically dependent on knowledge of the precise times and sequence of events. Accurate estimates of time depend on the quality of radiometric ages and the manner in which they are integrated in stratigraphic correlation and development of time scales. The impetus for this short course came from the work of a 2003 Earthtime workshop. The short course will focus on new windows on the history of life that have been opened by collaboration between paleontologists and geochronologists in estimating geologic ages. Speakers who have agreed to participate include Sam Bowring, Doug Erwin, George Gehring, Felix Gradstein, Brent Miller, Heiko Palike, Troy Rasbury, Paul Renne, and Peter Sadler. Organizers: Thomas Olszewski, Dept. of Geology and Geophysics, Texas A&M University, 3115 TAMU, College Station, TX 77843-3115, USA, +1-979-845-2465, fax +1-979-845-6162, tomo@geo.tamu.edu; Warren D. Huff, Dept. of Geology, University of Cincinnati, P.O. Box 0013, Cincinnati, OH 45221-0013, USA, +1-513-556-3731, fax: +1-513-556-6931, warren.huff@uc.edu.

Philadelphia 2006 K–12 Educational Events

SPECIAL K–12 TEACHER DAY FIELD TRIP AND WORKSHOP SHARE-A-THON

Sat., 21 Oct., 8 a.m.–5 p.m.

Cosponsored by GSA Geoscience Education Division

Calling all K–12 teachers and pre-service students! Join us for a day-long K–12 event. We will begin with an urban field trip through parts of Philadelphia, where we will observe various rocks and other natural building materials as they are used for construction and architectural aesthetics. Search for fossils on building faces, find the rare Pennsylvania bluestone, and measure microclimates and noise that is enhanced or mitigated by building designs. In the afternoon workshop share-a-thon, you can network with fellow teachers and geologists, pick up new lesson ideas, and be inspired by guest speakers who will share their stories. Guest passes to the opening of the Exhibit Hall will be available to participants. The participation fee for the entire day is only US$15 and includes lunch and giveaways. The registration form is available online at www.physics.purdue.edu/gsa/. This promises to be both entertaining and informative, so plan to join us for Teacher Day at GSA!

K–12 SHORT COURSE

Using Authentic Scientific Ocean Drilling Data for Earth Systems Science Inquiry [601]

Sun., 22 Oct., 9 a.m.–5 p.m. Cosponsored by *Joint Oceanographic Institutions; GSA Geoscience Education Division.* See the 2006 Philadelphia Short Courses, p. 24 of this issue, for description and registration information.

GEOSCIENCE EDUCATORS' SOCIAL RECEPTION

Saturday, 21 Oct., 5–7 p.m.

Come meet the GSA Education Staff! Appetizers and cash bar provided. See page 11 of this issue for more information.

Philadelphia 2006 Registration Information

- **Register online at www.geosociety.org.**
- **Register by mail** to 2006 GSA Annual Meeting, P.O. Box 9140, Boulder, Colorado 80301-9140.
- **Register by fax** at +1-303-357-1071 or +1-303-357-1072
  Please register only one professional or student per form and retain a copy for yourself.

Early Registration Deadline: 18 September

Cancellation Deadline: 25 September

Member fees also apply to members of the GSA Allied and Associated Societies (listed on the registration form). Registrations will not be processed unless full payment is received. Unpaid purchase orders are NOT accepted as valid registration. Registration confirmation from GSA will be your only receipt; you should receive it within two weeks after you register.

A **guest registration** fee of US$80 (after 18 Sept., US$85) per person is available for nongeologist spouses or family members and friends of a professional and/or student registrant and is required for those attending guest activities, tours, and seminars and for refreshments in the Guest Hospitality Suite and access to the Exhibit Hall. Formal guest tours are an additional cost and include professional tour guides, round-trip transportation, admission fees, and gratuities. The guest registration fee does NOT allow access to technical sessions; however, guests can sign in with the hostess in the Guest Hospitality Suite and get a visitor badge allowing them to attend a specific presentation.

Students: A CURRENT student ID is required to obtain student rates. You will have to pay the professional fee unless you have your ID.

As a special consideration, GSA is offering a discount rate to our members who are 70 years of age and older. Please write your membership number in the space provided and be sure to bring a picture ID to ensure your discount.

All registrations received after 18 September will be considered standard registrations and charged accordingly. **Absolutely no registrations should be mailed or faxed after 16 October.** Online registration will remain open until 18 October. After this date, we will handle registrations at the Pennsylvania Convention Center during normal registration hours. On-site fees for continuing education courses are an additional US$30.

CANCELLATIONS, CHANGES, AND REFUNDS

All requests for additions, changes, and cancellations must be made in writing and received by 25 September 2006. Faxes are accepted. **A US$30 processing fee will be charged for cancellation of a full or one-day professional registration if it is received in writing on or prior to 25 September.** NO REFUNDS WILL BE MADE ON CANCELLATION NOTICES RECEIVED AFTER THIS DATE. Refunds will be mailed from GSA after the meeting. Refunds for fees paid by credit card will be credited according to the card number on the registration form. There will be NO refunds for on-site registration, *Abstracts with Programs* volumes, and ticket sales.

Yes, Badges ARE Required

Badges are required for access to ALL activities, 8 a.m. Sunday through 5:30 p.m. Wednesday. If GSA receives your registration by 18 September, your badge will be mailed to you two weeks before the meeting. If you register after 18 Sept. or are located outside the U.S., you may pick up your badge at the GSA registration desk in the Pennsylvania Convention Center.

SAVE $ ON YOUR REGISTRATION FEE

GSA Allied and Associated Society members SAVE US$90 (professional) and US$30 (student) by registering before the early registration deadline. **Nonmembers** can also save US$90 (professional) and US$30 (student) by joining GSA now.

GSA MEMBERS PAY LESS
Join NOW or at the meeting!

Are you taking advantage of the member rate? If you are not a GSA member or a member of one of GSA's Allied or Associated Societies, isn't it time you joined? Pay less for your meeting registration and attend the GSA Annual Meeting as a GSA member. Professional Members save US$90 on registration for the full meeting and Student Members save US$30 *(registration received by 18 Sept.)*—**membership pays for itself!** To take advantage of all the benefits of membership, join via our secure Web site, www.geosociety.org/members, or contact our service team, +1-888-443-4472 or +1-303-357-1000, option 3, for an application form.

REGISTRATION FEES (all fees are in U.S. dollars[US$])

	EARLY (BY 18 SEPT.)	STANDARD (AFTER 18 SEPT.)
Prof. Member—Full Meeting	$305	$390
Prof. Member—1 Day	$199	$215
Prof. Member >70—Full Meeting	$250	$330
Prof. Member >70—1 Day	$145	$160
Prof. Nonmember—Full Meeting	$395	$485
Prof. Nonmember—1 Day	$235	$250
Student Member—Full Meeting	$95	$130
Student Member—1 Day	$65	$70
Student Nonmember—Full Meeting	$125	$160
Student Nonmember—1 Day	$80	$85
K–12 Teacher Member—Full Meeting	$40	$45
K–12 Teacher Member—Short Course only	No Fee	No Fee
Field Trip or Short Course only	$40	$40
Guest or Spouse	$80	$85

Each meeting registrant (guest/spouse registrants and those registered only for field trips or short courses are excluded) will receive a copy of the Abstracts with Programs on CD-ROM. The 2006 Section Meeting Abstracts are also included on the CD.

REGISTRATION GRANTS AVAILABLE

Registration Grant Sponsored by

SUBARU
DRIVEN BY WHAT'S INSIDE.

Subaru of America Inc. is sponsoring grants to cover one-half of the registration fees for member and nonmember earth science and geology faculty of Pennsylvania state two-year colleges and member and nonmember graduate students of Pennsylvania state universities. For more information, go to www.geosociety.org/meetings/2006/rSubaru.htm. For information on student travel grants, see page 12 of this issue.

ONSITE REGISTRATION HOURS

Grand Hall—Pennsylvania Convention Center

Sat., 21 Oct., 7 a.m.–4:30 p.m.
Sun., 22 Oct., 6:30 a.m.–7 p.m.
Mon.–Tues., 23–24 Oct., 7 a.m.–4:30 p.m.
Wed., 25 Oct., 7–11 a.m.

THE GEOLOGICAL SOCIETY OF AMERICA

Early Registration Deadline: *18 September*
Cancellation Deadline: *25 September*

GSA Annual Meeting Philadelphia, PA 22–25 October 2006

STANDARD REGISTRATION PART 1

GSA Member #

First Name

Last Name

Mailing Address

City State or Province

ZIP or Postal Code Country

Is this a change of address? ☐ Yes ☐ No ☐ Home ☐ or Work

E-mail

Daytime Phone

Fax

CHECK MEMBER AFFILIATION(S) (to qualify for member registration discount)

☐ (a) GSA	☐ (b) AAPG	☐ (c) AASG	☐ (d) AASP	☐ (e) AEG
☐ (f) AESE	☐ (g) AGA	☐ (h) AGID	☐ (i) AIPG	☐ (j) AMQUA
☐ (k) ARMA	☐ (l) ASBOG	☐ (m) ASLO	☐ (n) AWG	☐ (o) AWRA
☐ (p) CF	☐ (q) CUR	☐ (r) EEGS	☐ (s) GAC	☐ (t) GS
☐ (u) GSAus	☐ (v) GSIS	☐ (w) GSL	☐ (x) GSSA	☐ (y) HESS
☐ (z) IAGC	☐ (aa) IAH	☐ (bb) KWI	☐ (cc) MS	☐ (dd) MSA
☐ (ee) NABGG	☐ (ff) NAGT	☐ (gg) NESTA	☐ (hh) NGWA	☐ (ii) PRI
☐ (jj) PS	☐ (kk) SEG	☐ (ll) SEPM	☐ (mm) SGE	☐ (nn) SGM
☐ (oo) SSA	☐ (pp) SSSA	☐ (qq)SVP		

REGISTRATION FEES (all fees are in U.S. dollars[US$])

	EARLY (BY 18 SEPT.)	STANDARD (AFTER 18 SEPT.)	QTY.	US$ AMT.
(10) Prof. Member*—Full Meeting	$305	$390	1	$
(11) Prof. Member*—1 Day	$199	$215	1	$
(12) Prof. Member* >70—Full Meeting	$250	$330	1	$
(13) Prof. Member* >70—1 Day	$145	$160	1	$
(14) Prof. Nonmember—Full Meeting	$395	$485	1	$
(15) Prof. Nonmember—1 Day	$235	$250	1	$
(30) Student Member*—Full Meeting	$95	$130	1	$
(31) Student Member*—1 Day	$65	$70	1	$
(32) Student Nonmember—Full Meeting	$125	$160	1	$
(33) Student Nonmember—1 Day	$80	$85	1	$
(60) K–12 Teacher Member—Full Meeting	$40	$45	1	$
(62) K–12 Teacher Member—Short Course only**	$0	$0	1	$
(95) Field Trip or Short Course only	$40	$40	1	$
(90) Guest or Spouse***	$80	$85	1	$
REGISTRATION FEES SUBTOTAL				**$**

*Member Fee applies to any current Professional or Student Member of GSA or Associated/Allied Societies listed above.

**K–12 Member Short Course *only* gives you access to Short Courses. It does not allow access to the full meeting or technical sessions and does not include *Abstracts with Programs* on CD.

***Guest or Spouse registration fee does NOT allow access to technical sessions and does not include *Abstracts with Programs* on CD.

BADGE INFORMATION

First Name

Nickname

School/Company

City State/Prov.

Spouse/Guest First Name/Nickname

Last Name

City State/Prov.

Do you or your guest require any special considerations? ☐ Yes ☐ No

Will you be working in the Exhibit Hall? ☐ Yes ☐ No

Yes, I would like to contribute to the GSA Student Travel Fund

[701] ☐ $10 [702] ☐ $25 [703] ☐ $50 [704] ☐ $75
[705] ☐ $100 [706] ☐ Other $_____
(May be tax deductable, consult tax advisor).

SUBTOTAL (P. 1) US$

SUBTOTAL (P. 2) US$

TOTAL OF ALL FEES REMITTED US$

A $30 processing fee will be charged for cancellation of a full or one day professional registration received in writing prior to 25 September 2006. No refunds will be given after the cancellation deadline of 25 September 2006 for all registration types.

Photographs will be taken at the 2006 GSA Annual Meeting and Exposition. By registering for this meeting, you agree to allow GSA to use photographs that may include shots of you in any GSA-related publications, marketing and promotional materials, or Web site.

FAX TO: +1-303-357-1071 or +1-303-357-1072

MAIL TO: 2006 GSA ANNUAL MEETING
P.O. Box 9140, Boulder, CO 80301-9140, USA

REGISTER ONLINE AT: WWW.GEOSOCIETY.ORG

Remit in U.S. funds payable to:

2006 GSA ANNUAL MEETING

(All registrations must be prepaid. Purchase orders not accepted.)

PAYMENT BY (CHECK ONE): ☐ Check (No.)

☐ American Express ☐ Visa ☐ MasterCard ☐ Discover

Card Number

Expiration Date

Signature

(name as appears on card)

Registration confirmations will be sent via one of the following methods:

❶ E-mail (if valid e-mail address is provided) or ❷ Fax, or ❸ Mail

REGISTER ONLINE AT WWW.GEOSOCIETY.ORG.

		QTY.	US$ AMT.
GUEST PROGRAM (p. 14)			
101. Philadelphia Mural Tour; Sun., 1–3 p.m.	$53		$
102. Best of Philadelphia Half-Day Tour; Sun., 1–4 p.m.	$43		$
103. Picnic and History Tour of Laurel Hill Cemetery; Mon., 10 a.m.–1 p.m.	$53		$
104. Best of Philadelphia Tour w/Lunch on own at City Tavern; Mon., 9 a.m.–3 p.m.	$58		$
105. Amish Countryside Tour; Mon., 8 a.m.–4 p.m.	$118		$
106. Fairmount Park Houses Tour; Tues., 9 a.m.–noon.	$40		$
107. The Academy of Natural Sciences & Museum of Archaeology and Anthropology: Natural History Museum Tour; Tues., 9 a.m.–3 p.m.	$58		$
108. Winterthur and Longwood Gardens Tour; Tues., 8 a.m.–4 p.m.	$73		$
109. Morris Arboretum and the Valley Green Inn; Wed., 9 a.m.–2 p.m.	$73		$
SPECIAL EVENTS & TICKETED FUNCTIONS (p. 6)			
301. NAGT/GSA Geoscience Education Div. Luncheon; Sun.	$43		$
302. Beer and Geology Session; Sun.	$20		$
303. Engineering Geology Div. Luncheon & Awards Ceremony; Mon.	$43		$
304. History of Geology Div. Luncheon & Awards Ceremony; Mon.	$43		$
305. AWG Breakfast; Mon.			
[305A] Professional	$30		$
[305B] Student	$10		$
306. Campus Reps. Coffee Reception; Mon.	FREE	Limit 1	☐
307. Paleontological Society Lunch; Mon.			
[307A] Professional	$43		$
[307B] Student	$15		$
308. MSA Lunch; Tues.	$43		$
309. Hydrogeology Division Lunch; Tues.	$43		$
310. GSIS Lunch; Tues.	$43		$
311. MSA/GS Reception; Tues.			
[311A] Professional	$10		$
[311B] Student	$5		$
FIELD TRIPS (p. 16)			
401. Along-Strike Changes in the Architecture of a Fold-Thrust Belt: An Example from the Hudson Valley, New York; Thurs.–Sat., 19–21 Oct.	$245		$
402. Behind the Scenes at the American Philosophical Society, the Library Company, and the Academy of Natural Sciences: Research Collections in the History of Geology and Paleontology; Fri., 20 Oct.	$79		$
403. Buried Holocene Streams and Legacy Sediment: Late Pleistocene to Historical Changes in Stream Form and Process and Implications for Stream Restoration, Mid-Atlantic Piedmont Region; Sat., 21 Oct.	$89		$
404. Coastal Hydrology and Processes of Atlantic Barrier Islands; Sat., 21 Oct.	$89		$
405. Effects of Metasomatism and Fusion of Host Rock on the Chemistry of Early Jurassic Palisades Diabase in the Newark Basin; Sat., 21 Oct.	$129		$
406. Journey into Anthracite; Sat., 21 Oct.	$69		$
407. Lacustrine Cyclicity and the Triassic-Jurassic Transition; Fri.–Sat., 20–21 Oct.	$245		$
408. Late Pleistocene to Modern Lacustrine Processes and Paleoclimatic History in the Finger Lakes, New York; Fri.–Sat., 20–21 Oct.	$299		$
409. New Insights to an Old Fold-Thrust Belt; Fri.–Sat., 20–21 Oct.	$185		$
410. Plant Paleoecology and Geology of the Southern Anthracite Field, Pennsylvania; Fri., 20 Oct.	$69		$
411. Prehistoric and Urban Landscapes of the Middle Atlantic Region: Geoarchaeological Perspectives; Sat., 21 Oct.	$85		$
412. Refining the Metamorphic and Tectonic History of the SE Pennsylvania Piedmont: Recent Results from Monazite and Zircon Geochronology and Accessory-Phase Thermometry; Fri.–Sat., 20–21 Oct.	$245		$
413. Rivers, Glaciers, Landscape Evolution, and Active Tectonics of the Central Appalachians, Pennsylvania and Maryland; Wed.–Sat., 18–21 Oct.	$375		$
414. Rodinian Collisional and Escape Tectonics in the Hudson Highlands, New York; Thurs.–Sat., 19–21 Oct.	$245		$
415. Stratigraphy and Paleontology of the Chesapeake Group; Wed.–Sat., 18–21 Oct.	$275		$
416. Stratigraphy of the Cambrian and Lower Ordovician Carbonates of the Kittatinny Supergroup, Northwestern New Jersey: Special Attention to the Nature and Timing of Silica Diagenesis and the Origin of Nodular Cherts; Fri.–Sat., 20–21 Oct.	$199		$
417. Taconic Orogeny in the Susquehanna Shelf and Foreland; Fri.–Sat., 20–21 Oct.	$199		$
418. Tectonic History of the Blue Ridge, North-Central Virginia; Thurs.–Sat., 19–21 Oct.	$285		$
419. The Great Centralia Mine Fire: A Natural Laboratory for the Study of Coal Fires; Sat., 21 Oct.	$95		$
420. 135 Million Years of History in Southwestern; Philadelphia Sun., 22 Oct.	$59		$
421. Bicycle Tour of the Geology and Hydrology of Philadelphia; Tues., 24 Oct.			
[421A] With bike rental:	$55		$
[421B] Without bike rental:	$25		$
422. Erosion and the Hickory Run Boulder Field—1st Annual Kirk Bryan Field Seminar; Tues., 24 Oct.	$59		$
423. Geology of Delaware Water Gap, New Jersey–Pennsylvania; Wed., 25 Oct.	$89		$
424. Philadelphia Urban Hydrology; Wed., 25 Oct.	$45		$
425. A Tour of the Peach Bottom Slate—Once the Best Building Slate in the World; Thurs., 26 Oct.	$69		$
426. Arsenic in Groundwater in the Newark Basin; Thurs., 26 Oct.	$59		$
427. Central Appalachian Transect along the Potomac River Corridor; Thurs.–Fri., 26–27 Oct.	$259		$
428. Environmental Issues Associated with Sulfide Occurrences in Pennsylvania; Wed.–Fri., 25–27 Oct.	$225		$
429. From the K-T to the Coast: Paleontology, Stratigraphy, and Coastal Sedimentation from the Late Cretaceous through the Quaternary, Southern New Jersey; Thurs., 26 Oct.	$69		$
430. Geologic, Hydrogeologic, and Biogeochemical Controls on Natural and Enhanced Degradation of Industrial Solvents in Fractured Rocks; Thurs., 26 Oct.	$65		$
431. History and Geology of Gettysburg National Battlefield; Thurs., 26 Oct.	$95		$
432. Karst and Environmental Hydrology in Central Pennsylvania; Wed.–Fri., 25–27 Oct.	$295		$
433. Paleontology and Paleoenvironments of the Upper Devonian Catskill Formation in North-Central Pennsylvania; Thurs.–Fri., 26–27 Oct.	$175		$
434. Prehistoric Quarries and Early Mines in the New York–New Jersey–Pennsylvania Tri-State Metropolitan Area; Thurs.–Sat., 26–28 Oct.	$299		$
SHORT COURSES (p. 23)			
501. Beyond the Content: Teaching Scientific and Citizenship Literacies in the Geosciences; Sat. 21 Oct.	$200		$
502. Using GPS Data to Study Crustal Deformation, Earthquakes, and Volcanism: A Workshop for College Faculty; Sun., 22 Oct.	$160		$
503. Digital Terrain Mapping; Sat., 21 Oct.	$240		$
504. Enhanced Seismology Education for Undergraduates; Sat., 21 Oct.	$15		$
505. Scientific Inquiry in the K–16 Classroom: What Every Scientist Should Know about Effective Science Education; Sat., 21 Oct.	$145		$
506. Using Earth Ed \Online: Online Delivery System for Data-Rich Inquiry Education; Sat., 21 Oct.	$200		$
507. Education Research: An In-Depth Look at Qualitative Methods; Sat., 21 Oct.	$140		$
508. Using Online Igneous Geochemical Databases for Research and Teaching; Sat., 21 Oct.	$25		$
509. Introduction to Geographic Information Systems (GIS) Using ArcGIS9 for Geological Applications; Fri.–Sat., 20–21 Oct.	$299		$
K–12 SHORT COURSE (p. 24)			
601. Using Authentic Scientific Ocean Drilling Data for Earth Systems Science Inquiry; Sun., 22 Oct.	$25		$
***ABSTRACTS WITH PROGRAMS* VOLUME**			
This year GSA will provide each meeting registrant* with a copy of the *Abstracts with Programs* on CD-ROM. The 2006 Section Meeting Abstracts are also included on the CD.			
901 *Abstracts with Programs* (*AWP*) book	$30		$
901A. *AWP* book shipped within Colo. subject to 2.9% state sales tax	$0.87		$
AWP book will be shipped ~3 weeks prior to the meeting. Delivery prior to the start of the meeting is not guaranteed.			
902. *AWP* book, to be picked up on-site (includes Philadelphia tax)	$32.10		$
903. Additional copy(s) of Abstracts on CD-ROM**, to be picked up on-site (includes Philadelphia tax)	$25.68		$
*Not including Field Trip or Short Course only and Guest or Spouse registrants			
**Includes 2006 Section Meetings Abstracts			
SUBTOTAL (p. 2)			**US$**

STANDARD REGISTRATION PART 2.

REGISTER ONLINE AT WWW.GEOSOCIETY.ORG.

Travel & Transportation

TRAVELING TO PHILADELPHIA

Philadelphia is easy to reach by car, train, bus, or air. I-95 runs north and south through Philadelphia. You can also access the region via the Pennsylvania and New Jersey turnpikes. By car, Philadelphia is just two hours from New York City and Baltimore and just under three hours from Washington DC. Amtrak operates from Philadelphia's 30th Street Station with service along the northeast corridor, and regional bus service is available via Greyhound. Philadelphia International Airport is served by most major airlines, and with the arrival of several new discount carriers, service to Philadelphia is more affordable and convenient than ever.

TRAINS

Amtrak (National Railroad Passenger Corporation): Trains arrive at Amtrak's historic 30th Street Station. Call +1-800-272-7245 or go to www.amtrak.com for information.

Southeastern Pennsylvania Transportation Authority Regional Rail Lines: Service to Market East Station, 10th and Market streets, and 16th Street and John F. Kennedy Boulevard. For more information, call +1-215-580-7800 or go to www.septa.org.

BUSES

New Jersey Transit: Trailways Terminal, 13th and Arch streets; +1-215-569-3752.

Greyhound/Trailways: Trailways Terminal, l0th and Filbert streets; +1-215-931-4014.

AIR TRAVEL

Recently rated as one of the best airports in the nation by the *Wall Street Journal*, Philadelphia International Airport (PHL) services 1,300 arrivals and departures daily. The airport is seven miles from Philadelphia Center City. The following airlines have been contracted to provide convention rates to and from Philadelphia for the 2006 GSA Annual Meeting & Exposition. You can save up to 15% on published airfares by booking through the group reservation desks at the numbers listed below.

American Airlines
www.aa.com
+1-800-433-1790
Group Code: #A19H6AI

American Airlines is offering discounts of 5% off all published round-trip fares. Call +1-800-433-1790 and reference Group Code #A19H6AI.

Frontier Airlines
www.frontierairlines.com
+1-800-908-9068
Ticket Designator: #MC004G

Frontier Airlines is offering discounts of 10% off all published round-trip fares. Call +1-800-908-9068 and reference Ticket Designator #MC004G.

United Airlines
www.united.com
+1-800-521-4041
Meeting ID#: 563TH

United is offering a 7% discount off the lowest applicable discount fare if booked more than 30 days prior to arrival and a 2% discount off the lowest applicable discount fare if booked less than 30 days prior to arrival. There is a 10% discount off of fully refundable tickets booked more than 30 days prior to arrival and a 5% discount off of fully refundable tickets booked less than 30 days prior to arrival. First-class and business travelers receive a 15% discount if booked more than 30 days prior to arrival and 10% if booked less than 30 days prior to arrival. Call +1-800-521-4041 and reference Meeting ID #563TH.

TRANSPORTATION TO AND FROM PHILADELPHIA INTERNATIONAL AIRPORT

The Southeastern Pennsylvania Transportation Authority Regional Rail Lines (SEPTA) **R1 Airport train** provides service from the airport to Center City every half-hour daily from 6 a.m. to midnight. The line stops at Amtrak's 30th Street Station, Suburban Station (16th Street and John F. Kennedy Boulevard), and at Market East Station (attached to the Pennsylvania Convention Center). Travel time is 23 minutes, and the maximum weekday fare is $7. For more information, call +1-215-580-7800 or go to www.septa.org.

CAR RENTAL

Enterprise Rent-a-Car
1-800-Rent-a-Car; www.enterprise.com
Group Code: 17C8796
Event Name: CON

You may book reservations online at www.enterprise.com; simply enter your group code, 17C8796, in the optional account box and then press enter, then enter the first three letters of your event name, CON, and press enter. You may also book through Enterprise's National Reservations Center at 1-800-Rent-a-Car. All renters must be at least 21 years of age and have a valid driver's license and credit card in their possession when they pick up their rental vehicle.

SHUTTLE SERVICE

Lady Liberty Transportation
+1-215-724-8888

Lady Liberty Transportation provides shuttle service for Philadelphia International Airport. Reservations are not necessary. The Lady Liberty van runs 24 hours a day, 7 days a week. You can locate Lady Liberty shuttle vans at the baggage claim area or by dialing #27 on any airport phone. Lady Liberty will also prearrange shuttle service. Return reservations can be made by calling +1-215-724-8888 or by contacting your hotel bell captain.

TAXIS

A fleet of 1,400 cabs serves the area. Taxi services can be picked up at Zone 5 on the Commercial Transportation Roadway. Should you need to pay by credit card, please advise the dispatcher upon your arrival to the taxi area because not all cabs or companies accept credit cards or vouchers as a form of payment. Taxi dispatch is available 24 hours a day.

City Cab: +1-215-492-6500
Quaker City Cab: +1-215-728-8000

WHEELCHAIR-ACCESSIBLE BUSES, SHUTTLES, TAXIS, OR VANS

All of the buses and trains are wheelchair accessible. The following company will pick you up with prior notice at Philadelphia International Airport and provide specialized transportation. Please make arrangements prior to your arrival.

ADA Paratransit +1-215-580-7145

TRANSPORTATION OPTIONS IN PHILADELPHIA

GSA will NOT be providing shuttle service from the hotels to the convention center; however, arrangements for transportation to and from the GSA-designated hotels and the Pennsylvania Convention Center will be provided by GSA for the elderly or disabled. For more information, contact Erin Pitner, epitner@geosociety.org, +1-303-357-1006.

Getting around: Philadelphia Center City is compact, and its grid-like layout makes it very walkable. **SEPTA** operates a large number of bus routes, a subway line, an elevated train, and regional rail lines that provide service throughout the city and into the surrounding countryside. Suburban Station and Market East regional rail stations are in the heart of the business, shopping, and hotel districts. Learn more at www.septa.org. **The Phlash** trolley service provides quick and easy connections between Center City attractions and most downtown hotels and is just $1 each time you board. Learn more at www.phillyphlash.org. Finally, catching a **cab** in Center City is easy: just head for the nearest street corner and flag one down.

TRAVEL GRANTS

See page 12 of this issue for information on student travel grants.

General Meeting Information

ACCESSIBILITY FOR REGISTRANTS WITH SPECIAL NEEDS

GSA is committed to making the annual meeting accessible to all people interested in attending. If you need auxiliary aids or service because of a disability, check the appropriate box on the registration form. If you have suggestions or need further information, contact Kevin Ricker, kricker@geosociety.org, +1-303-357-1090. Please let us know your needs by 18 September 2006.

CHILD CARE

GSA will provide child care for registered meeting attendees at the 2006 Philadelphia annual meeting. Please check GSA's official annual meeting Web site, www.geosociety.org/meetings/2006, for additional information. Contact Erin Pitner, epitner@geosociety.org, +1-303-357-1006, with any questions.

TOURIST INFORMATION

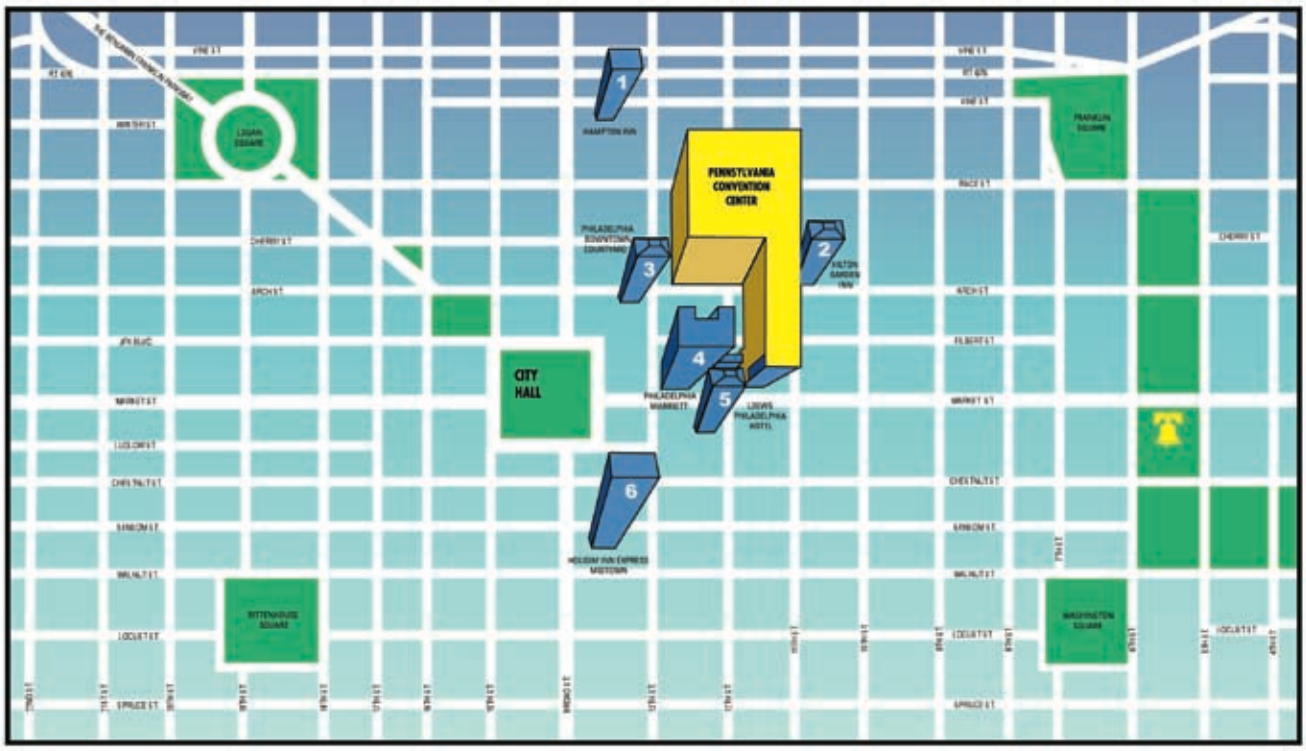
For general information about sightseeing, accommodations, restaurants, and shopping in Philadelphia, go to www.pcvb.org or www.geosociety.org/meetings/2006.

WEATHER AND CLIMATE

The average maximum daytime temperature for Philadelphia in October is 66 °F (19 °C), with an average rain fall of 2.75 in. (69.8 mm). This is a four-season town, and fall displays the amazing colors of the area's abundant trees.

2006 Philadelphia Hotel Map

PHILADELPHIA ACCOMMODATIONS



GEOLOGICAL SOCIETY OF AMERICA

22-25 October 2006

1 Hampton Inn Center City
0.47 mile from convention center

2 Hilton Garden Inn – Philadelphia Center City
0.01 mile from convention center

3 Philadelphia Downtown Courtyard by Marriott
0.32 mile from convention center

4 Philadelphia Marriott Downtown
0.31 mile from convention center

5 Loews Philadelphia Hotel
0.39 mile from convention center

6 Holiday Inn Express Midtown
0.75 mile from convention center

Geological Society of America
2006 Annual Meeting & Exposition
22–25 October 2006
Philadelphia, Pennsylvania

THE GEOLOGICAL SOCIETY OF AMERICA

INSTRUCTIONS
Reservations can be made in one of the following ways:

INTERNET:
www.geosociety.org

TELEPHONE:
Toll free (US): +1-888-221-9425
International: +1-801-534-4953

FAX:
+1-801-355-8019

MAIL:
The Housing Connection
90 South West Temple
Salt Lake City, UT 84101, USA

DEADLINE
Reservations must be made by phone, fax, mail or internet by **21 September 2006** in order to guarantee convention rates.

CONFIRMATIONS
The Housing Connection will send you a confirmation of your reservation. Please review all information for accuracy. E-mail confirmations will be sent if an e-mail address is provided (preferred), or they can be faxed or mailed. If you do not receive a confirmation or have questions, please call The Housing Connection **You will not receive a confirmation from the hotel.**

TAX RATE and REQUESTS
All rates are per room and are subject to 14.1% tax (subject to change). Special requests can not be guaranteed; however, hotels will do their best to honor all requests. Hotels will assign specific rooms upon check-in, based on availability.

ROOM DEPOSIT REQUIRED TO SECURE RESERVATION:
Reservations will not be accepted without a Room Deposit of one night's room rental plus tax for each room reserved. Room Deposits will be accepted in the form of a check made payable to: The Housing Connection, 90 South West Temple, Salt Lake City, UT 84101; or a valid credit card with signature authorizing the credit card to be charged for the Room Deposit. If the charge to the credit card is denied, we reserve the right to release your reservation.

CANCELLATION POLICY
Cancellations after 21 September 2006 and prior to 72 hours before arrival date will be subject to a $25.00 cancellation fee. One night's room and tax will be forfeited entirely if cancellation occurs within 72 hours of arrival.

GUEST INFORMATION

Arrival Date _____ ***Departure Date*** _____

First Name _____ M.I. __ Last Name _____

E-mail Address: _____

Daytime Phone: _____ Fax: _____

Company _____

Address _____

Address 2 _____

City/State/Province _____

Zip/Postal Code, Country _____

HOTEL SELECTION

Hotel	Preference*	Single	Double	Triple	Quad
**Loews Philadelphia Hotel	_____	$193.00	$193.00	$213.00	$233.00
**Marriott Philadelphia	_____	$194.00	$205.00	$215.00	$225.00
Courtyard by Marriott Downtown	_____	$179.00	$179.00	$199.00	$199.00
Hampton Inn	_____	$159.00	$159.00	$169.00	$169.00
Hilton Garden Inn	_____	$153.00	$153.00	$173.00	$173.00
Holiday Inn Express Midtown	_____	$139.00	$149.00	$159.00	$159.00

**Please number hotels in order of preference (1st, 2nd, 3rd, etc.) above*
***Co-Headquarters Hotels*

Room Type Requested: _____ One Bed _____ Two Beds

Submit only one room request per form. Should additional forms be needed, please make copies.
If requested hotels are unavailable, a reservation will be made at the next available hotel. Please select criteria:

☐ Comparable room rate ☐ Proximity to conference site

To request a suite, please contact your hotel directly.

List all room occupants:

_____ _____

☐ Check here if you have a disability requiring special services ☐ Non smoking request

Special requests: _____

DEPOSIT INFORMATION

All reservations requests must be accompanied by a credit card guarantee or check for one night's deposit. Housing Forms received without a valid guarantee/deposit will not be processed. Faxed requests must include a valid credit card. Check deposits must be mailed with a completed housing form.

☐ Visa ☐ Discover ☐ Diner's Club
☐ MasterCard ☐ American Express

Card Number _____ Exp. Date _____

Name on Credit Card _____

Cardholder's Signature* _____

*I hereby authorize The Housing Connection or any one of the participating hotels, to process a charge to my credit card for each Room Deposit in accordance with the policies and information provided herein no sooner than 21 September 2006.

☐ One night's check deposit enclosed and made payable to SLCVB Housing. Mail housing forms to: The Housing Connection, 90 South West Temple, Salt Lake City, UT 84101, USA.

Pardee Keynote Symposia

INVITED PAPERS

The Pardee Keynote Symposia are made possible by a grant from the Joseph T. Pardee Memorial Fund.

These Pardee keynote sessions are *special events* of broad interest to the geoscience community. They represent hot issues on the leading edge in a scientific discipline or area of public policy, address broad fundamental issues, and are interdisciplinary. Selection was on a competitive basis. This year's eight Pardee Symposia were reviewed and accepted by the Annual Program Committee. ***(All speakers are invited.)***

P1. Erosion: Processes, Rates, and New Measuring Techniques

GSA Quaternary Geology and Geomorphology Division

Geomorphology; Quaternary Geology/Geomorphology

Mon., 23 Oct., 8 a.m.–noon. Frank Pazzaglia, Lehigh University, Bethlehem, Pa.; Paul Bierman, University of Vermont, Burlington, Vt.; Milan Pavich, U.S. Geological Survey, Reston, Va.; Dorothy Merritts, Franklin and Marshall College, Lancaster, Pa.

Synthetic view of the fundamental processes and rates of landscape erosion across wide temporal and spatial scales. Review of emerging techniques in measuring erosion and implications for landscape evolution, global sedimentary budgets, and human impacts.

P2. Evidence for Long-Term Survival of Microorganisms and Preservation of DNA

GSA Geobiology and Geomicrobiology Division

Geomicrobiology; Planetary Geology; Archaeological Geology

Tues., 24 Oct., 8 a.m.–noon. Tim K. Lowenstein, Binghamton University, Binghamton, N.Y.; Michael N. Timofeeff, Binghamton University, Binghamton, N.Y.; Brian A. Schubert, Binghamton University, Binghamton, N.Y.

Talks will present evidence for or against long-term survival of microorganisms and preservation of DNA in amber, ancient salt, subsurface rocks, deep sea sediments, glacial ice, permafrost, bones, and teeth.

P3. Geosciences and the Media: How Can We Better Communicate the Imperatives of Sustainability?

GSA Geology and Society Division; Critical Issues Caucus, Geology and Public Policy Committee; GSA Quaternary Geology and Geomorphology Division; GSA Engineering Geology Division; Association of Earth Science Editors

Geoscience Information/Communication; Public Policy; Environmental Geoscience

Mon., 23 Oct., 1:30–5:30 p.m. Paul H. Reitan, University at Buffalo, Buffalo, N.Y.; Susan W. Kieffer, University of Illinois, Urbana, Ill.; E-an Zen, University of Maryland, College Park, Md.; Allison R. Palmer, Institute for Cambrian Studies, Boulder, Colo.

Geoscientists have significant knowledge of hazards (volcanoes, earthquakes) and insidious creeping megacrises (soil, water, resources, climate). A sustainable future needs more effective cooperation with the media for successful communication and public education on these issues.

P4. Holocene Sea Level Change in North America: A Post-Katrina Assessment

GSA Quaternary Geology and Geomorphology Division; IGCP 495 (Quaternary Land-Ocean Interactions: Driving Mechanisms and Coastal Responses)

Quaternary Geology; Marine/Coastal Science; Neotectonics/Paleoseismology

Sun., 22 Oct., 1:30–5:30 p.m. Torbjörn E. Törnqvist, Tulane University, New Orleans, La.; Benjamin P. Horton, University of Pennsylvania, Philadelphia, Pa.

The concerns about sea-level rise and coastal responses are larger than ever in the post-Katrina world. This session, a contribution to IGCP 495, will address Holocene sea-level change in North America from a multidisciplinary perspective.

P5. Links between Geological Processes, Microbial Activities, and Evolution of Life

GSA International Division; GSA Geobiology and Geomicrobiology Division; GSA Geology and Society Division; GSA Structural Geology and Tectonics Division

Tectonics; Geomicrobiology; Geochemistry, Other

Tues., 24 Oct., 1:30–5:30 p.m. Yildirim Dilek, Miami University, Oxford, Ohio; Harald Furnes, University of Bergen, Bergen, Norway; Karlis Muehlenbachs, University of Alberta, Edmonton, Alberta

This session will explore the mode and/or nature of links between geological processes and microbial activities as recorded in the Precambrian through modern rocks and their implications for the origin/evolution of life on Earth and other planets.

P6. Natural and Anthropogenic Disasters: Earth and Health Scientists Working Together to Identify Potential Health Issues and Improve Outcomes

GSA Geology and Health Division

Environmental Geoscience; Public Policy

Sun., 22 Oct., 8 a.m.–noon. Geoffrey S. Plumlee, U.S. Geological Survey, Denver, Colo.; Gabriel Filippelli, Indiana University–Purdue University, Indianapolis, Ind.

Disasters, both natural and human-produced, put a large strain on public health resources. This session brings together earth scientists and public health experts to understand the links between causes, impacts, and health-related outcomes of disasters.

P7. Using Historical Photographs and Maps to Document Landscape Evolution and the Impacts of Changing Climate: A Celebration of the 96th Birthday of Bradford Washburn

Quaternary Geology; Geomorphology; Environmental Geoscience

Wed., 25 Oct., 8 a.m.–noon. Bruce Franklin Molnia, U.S. Geological Survey, Reston, Va.; Mike Sfraga, University of Alaska, Fairbanks, Alaska

This session in celebration of the 96th birthday of Bradford Washburn focuses on the use of historic photographs and maps to document landscape dynamics and evolution and to document Earth's response to human and natural forces.

P8. When One Planet Isn't Enough: Celebrating 25 Years of Solar System Exploration

GSA Planetary Geology Division

Planetary Geology

Sun., 22 Oct., 1:30–5:30 p.m. R. Aileen Yingst, University of Wisconsin, Green Bay, Wis.; Herbert Frey, National Aeronautics and Space Administration–Goddard Space Flight Center, Greenbelt, Md.; Louise Prockter, Applied Physics Lab, Laurel, Md.

The Planetary Geology Division is proud to be celebrating its 25th anniversary as a Division of the Geological Society of America. In this session, the Division presents a selection of important, influential, and exciting discoveries, results, or controversies in planetary geology in the past 25 years.

FUTURE GSA ANNUAL MEETINGS

2007 Denver, Colo. (28–31 October)
2008* Houston, Tex. (5–8 October)
2009 Portland, Ore. (18–21 October)
2010 Denver, Colo. (31 Oct.–3 Nov.)
2011 Minneapolis, Minn. (9–12 October)

*Joint meeting with American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America.

GSA Trivia Night

Come along and test your knowledge of geoscience trivia at this evening of fun. Over 100 questions will have you racking your brain and testing your skills!

Register a team or join a mixed team. Meet new people, share your knowledge, and have a great evening in Philadelphia. Winning teams will be awarded fabulous prizes and the prestige of being GSA Trivia Night winners!

Teams and individuals can register before the event. E-mail glewis@geosociety.org.

Graduate School Information Forum

EXHIBIT HALL
Sun., 22 Oct., 8 a.m.–7:30 p.m.
Mon.–Wed., 23–25 Oct., 8 a.m.–5:30 p.m.

Meet face-to-face with prospective students in a relaxed, informal setting by participating in the Graduate School Information Forum (GSIF) during the GSA Annual Meeting. Take advantage of this excellent opportunity to promote your school to over 1,500 students.

The forum will be open Sunday from 8 a.m. to 7:30 p.m. This coincides with the Welcoming Party in the Exhibit Hall on Sunday evening. The hours for Monday through Wednesday are 8 a.m. to 5:30 p.m.

You may choose to reserve space for one day or for all four days. Space is limited, and Sunday and Monday will be the first to sell out. Schools reserving multiple days will be assigned first and to the most visible booths.

Participating schools will be promoted in the September *GSA Today* (pending submittal date of reservation form), the 2006 Annual Meeting Program, and as e-mail links on the GSA Web site so prospective students may schedule appointments prior to the Annual Meeting.

Go online to reserve your space at www.geosociety.org/meetings/2006/xGSIF.htm. For more information, contact Kevin Ricker, +1-303-357-1090, kricker@geosociety.org.

DON'T DELAY—RESERVE YOUR SPACE NOW!

Topical and Discipline Sessions

ABSTRACTS DEADLINE: 11 JULY

TOPICAL SESSIONS

Below is a listing of all approved topical sessions. These sessions are topically focused with a mix of invited and volunteered papers. Sessions are designed to promote the exchange of interdisciplinary, state-of-the-art information. Papers can be submitted to a specific topical session, and you may choose up to three scientific categories. After each topical description below, the categories are identified as they appear on the abstract form. ***Please*** **submit only in the mode** (oral or poster) **and categories indicated in the description.** An abstract submitted in the incorrect mode will be transferred automatically to a discipline session.

Abstracts Deadline: 11 July

Please use the online electronic abstract form found on the GSA Web site, www.geosociety.org. An abstract submission fee will be charged. The fee is US$18 for all students and US$30 for all others. If you cannot submit your abstract electronically, contact Nancy Carlson, +1-303-357-1061, ncarlson@geosociety.org.

DISCIPLINE SESSIONS

From the list found on the electronic abstract form, you may choose up to three discipline categories you feel your abstract would best fit. Joint Technical Program Committee representatives organize the papers in sessions focused on disciplines (e.g., environmental geoscience, mineralogy).

T1. High Resolution Quaternary Records from Cave Environments
GSA Archaeological Geology Division; GSA Quaternary Geology and Geomorphology Division; GSA Hydrogeology Division; GSA Sedimentary Geology Division; Society for Vertebrate Paleontology; Paleontological Society; Geochemical Society; Karst Waters Institute
Archaeological Geology; Geochemistry, Other; Quaternary Geology
Bonnie A.B. Blackwell, Williams College, Williamstown, Mass.; Donald McFarlane, Claremont College, Claremont, Calif. ORAL and POSTER

T2. Alluvial Geoarchaeology of Large River Valleys
GSA Archaeological Geology Division
Archaeological Geology; Geomorphology; Quaternary Geology
David L. Cremeens, GAI Consultants, Inc., Homestead, Pa. ORAL

T3. Reconstructing Landscape Contexts of Human Occupation Surrounding Wetlands
GSA Archaeological Geology Division; GSA Limnogeology Division; GSA Geology and Society Division
Archaeological Geology; Limnogeology; Quaternary Geology/Geomorphology
Catherine H. Yansa, Michigan State University, East Lansing, Mich.; Andrea K.L. Freeman, University of Calgary, Alberta. ORAL

T4. Marine Geoarchaeology: New Exploration of Sites from Coast to Shelf (Posters)
GSA Archaeological Geology Division
Archaeological Geology; Marine/Coastal Science; Quaternary Geology/Geomorphology
Jean-Daniel Stanley, Smithsonian Institution, Washington, D.C.; Eduard G. Reinhardt, McMaster University, Hamilton, Ontario. POSTER

T5. Archaeological and Geoarchaeological Records of Natural and Human-Induced Disasters
GSA Archaeological Geology Division
Archaeological Geology; Quaternary Geology/Geomorphology
Tina M. Niemi, University of Missouri, Kansas City, Mo.; Suzanne Leroy, University of Missouri, Kansas City, Mo.; L. Mark Raab, University of Missouri, Kansas City, Mo. ORAL and POSTER

T6. Geoarchaeology of Prehistoric Earthworks
GSA Archaeological Geology Division
Archaeological Geology; Quaternary Geology/Geomorphology
Rolfe D. Mandel, University of Kansas, Lawrence, Kans. ORAL

T7. Coal Utilization in the 21st Century: Environmental Issues
GSA Coal Geology Division; GSA Geology and Society Division; Public Policy; GSA Geobiology and Geomicrobiology Division
Coal Geology; Environmental Geoscience; Public Policy
John Kiefer, GSA Geology and Society Division, Lexington, Ky.; James C. Hower, University of Kentucky, Lexington, Ky.; Stephen F. Greb, University of Kentucky, Lexington, Ky.; Cortland F. Eble, University of Kentucky, Lexington, Ky. ORAL

T8. U.S. Energy Resources: Options, Scenarios, and Policy
GSA Coal Geology Division; Public Policy
Coal Geology; Environmental Geoscience; Economic Geology
Leslie F. Ruppert, U.S. Geological Survey, Reston, Va.; Brenda S. Pierce, U.S. Geological Survey, Reston, Va. ORAL

T9. "Ice House"/"Hothouse"—An Analysis of Late Paleozoic Floras and Their Response to Global Climate Change
GSA Coal Geology Division; The American Association of Stratigraphic Palynologists (AASP); Paleontological Society; Society for Sedimentary Geology (SEPM); GSA Geobiology

and Geomicrobiology Division
Coal Geology; Paleontology/Paleobotany; Paleontology, Diversity, Extinction, Origination
Cortland Eble, University of Kentucky, Lexington, Ky.; Thomas D. Demchuk, ConocoPhillips; Hermann Pfefferkorn, University of Pennsylvania, Philadelphia, Pa.; Robert A. Gastaldo, Colby College, Waterville, Maine. ORAL

T10. Geotechnical Investigations: The Phase 1 Investigation in Karst Terrain
Engineering Geology; Environmental Geoscience; Geomorphology
Richard F. Dalton, New Jersey Geological Survey, Trenton, N.J.; William E. Kochanov, Pennsylvania Geological Survey, Middletown, Pa. ORAL and POSTER

T11. Engineering Geology in the Northeastern United States
Master of Science in Applied Geoscience Graduate Program at the University of Pennsylvania
Engineering Geology; Hydrogeology; Environmental Geoscience
Craig R. Calabria, GeoSystems Consultants, Inc., Fort Washington, Pa.; Chad Freed, Widener University, Chester, Pa. ORAL

T12. Fractured Rock Characterization in Applied Geology
GSA Engineering Geology Division; GSA Structural Geology and Tectonics Division; American Rock Mechanics Association
Engineering Geology; Structural Geology; Hydrogeology
William C. Haneberg, Haneberg Geoscience, Seattle, Wash. ORAL

T13. Mining as a Factor in Human Health
GSA Geology and Health Division; GSA Geology and Society Division
Environmental Geoscience; Coal Geology; Hydrogeology
Larry D. Woodfork, Consulting Geologist, Morgantown, W.Va.; E. Lynn Savage, Brooklyn College, City University of New York, Brooklyn, N.Y. ORAL

T14. Arsenic, Lead, and Mercury in Urban and Rural Watersheds
Public Policy; GSA Geology and Society Division
Environmental Geoscience; Geochemistry, Aqueous; Hydrogeology
Curtis L. Hollabaugh, University of West Georgia, Carrollton, Ga.; Randa R. Harris, University of West Georgia, Carrollton, Ga. ORAL and POSTER

T15. Geochemical Modeling Applications in Ground Water Systems
International Association of GeoChemistry (IAGC); GSA Hydrogeology Division
Environmental Geoscience; Geochemistry, Aqueous; Hydrogeology
June E. Mirecki, U.S. Army Engineer Research and Development Center, Vicksburg, Miss.; Russell S. Harmon, Research Triangle Park, N.C. ORAL and POSTER

T16. The Effect of Diagenetic Factors Such as Organic Complexation, Microbial Activity, and Mineral Surface Sorption/Complexation on the Mobilization/ Sequestration of Uranium in Recent Sediments
Environmental Geoscience; Geochemistry, Organic; Geomicrobiology
Lenaye Bolanos, Stony Brook University, Stony Brook, N.Y.; Paul A. Northrup, Brooklyn National Laboratory, Upton, N.Y. ORAL and POSTER

T17. An Early Involvement of Undergraduates and K7–12 Students in Geological and Environmental Research (Posters)
GSA Geoscience Education Division
Environmental Geoscience; Geoscience Education; Geoscience Information/Communication
Nazrul I. Khandaker, York College of the City University of New York, Jamaica, N.Y.; Stanley Schleifer, York College of the City University of New York, Jamaica, N.Y. POSTER

T18. Collegiate Watershed Research Projects: Opportunities for Student Learning and Community Involvement
GSA Geoscience Education Division; Council on Undergraduate Research
Environmental Geoscience; Geoscience Education; Geochemistry, Aqueous
Kirsten M. Menking, Vassar College, Poughkeepsie, N.Y.; Brannon Andersen, Furman University, Greenville, S.C. POSTER

T19. Distribution of Arsenic and Related Metalloids in Surface and Ground Waters: Controls and Challenges
GSA Hydrogeology Division; GSA Geology and Health Division; GSA Geology and Society Division
Environmental Geoscience; Hydrogeology; Geochemistry, Aqueous
Kaye Savage, Vanderbilt University, Nashville, Tenn.; Andrea Foster, U.S. Geological Survey, Menlo Park, Calif.; Prosun Bhattacharya, Royal Institute of Technology (KTH), Stockholm, Sweden; Abhijit Mukherjee, University of Kentucky, Lexington, Ky. ORAL and POSTER

T20. The Occurrence, Bioavailability, and Toxicity of Arsenic and Fluoride from Drinking Water—A Widespread Issue
GSA Geology and Health Division; GSA Geology and Society Division; Geochemical Society
Geology and Health
Michalann Harthill, U.S. Geological Survey, Reston, Va.; Achim Herrmann, Arizona State University, Tempe, Ariz. ORAL

T21. Holocene Sequences of Environmental Disasters: The Terrestrial and Marine Palynological Records
American Association of Stratigraphic Palynologists (AASP)
Environmental Geoscience; Paleoclimatology/ Paleoceanography; Quaternary Geology/Geomorphology
Owen K. Davis, University of Arizona, Tucson, Ariz. ORAL

T22. Sigma Gamma Epsilon Student Research (Posters)
Sigma Gamma Epsilon
Environmental Geoscience; Paleontology/Paleobotany; Quaternary Geology/Geomorphology
Richard L. Ford, Weber State University, Ogden, Utah; Charles Mankin, Oklahoma Geological Survey, Norman, Okla.; Donald Neal, East Carolina University, Greenville, N.C. POSTER

T23. Multidisciplinary Approaches to Geochemical Problems
Geochemistry, Aqueous; Geomicrobiology; Geoscience Information/Communication
Nancy Washton, Pennsylvania State University, University Park, Pa.; Karl T. Mueller, Pennsylvania State University, University Park, Pa. ORAL and POSTER

T24. Innovations in Groundwater Vulnerability Assessment (Posters)
GSA Hydrogeology Division
Geochemistry, Aqueous; Hydrogeology; Remote Sensing/ Geographic Info System
Jason J. Gurdak, U.S. Geological Survey, Denver, Colo.; John E. McCray, Colorado School of Mines, Golden, Colo. POSTER

T25. Water-Quality Issues in Sole-Source and Principal Aquifers in the United States
GSA Hydrogeology Division; National Ground Water Association
Geochemistry, Aqueous; Hydrogeology; Environmental Geoscience
Brian G. Katz, U.S. Geological Society, Tallahassee, Fla.; Michael J. Focazio, U.S. Geological Society, Reston, Va. ORAL and POSTER

T26. Experimental Investigations into Hydrothermal Systems: Implications for Mass Transfer in the Earth's Crust
Geochemical Society; Society of Economic Geologists; Mineralogical Society of America
Geochemistry, Aqueous; Petrology, Experimental; Economic Geology
Brian Rusk, U.S. Geological Survey, Denver, Colo.; John Kaszuba, Los Alamos National Laboratory, Los Alamos, N.Mex. ORAL

T27. Better Living through Geochemistry: Fostering an Understanding of Terrestrial Paleoenvironments and Paleoclimates
GSA Sedimentology Division; Society for Sedimentary Geology, Geochemical Society
Geochemistry, Other; Paleontology, Biogeography/ Biostratigraphy; Sediments, Carbonates
Aisha H. Al-Suwaidi, University of Kansas, Lawrence, Kans.; Franciszek Hasiuk, University of Michigan, Ann Arbor, Mich.; Julie B. Retrum, University of Kansas, Lawrence, Kans. ORAL and POSTER

T28. An Appetite for Apatite: Conodont-Based Geological Investigations in the 21st Century
Paleontological Society; Pander Society; Geochemical Society
Geochemistry, Other; Paleontology/Paleobotany; Paleoclimatology/Paleoceanography
Jared R. Morrow, University of Northern Colorado, Greeley, Colo.; D. Jeffrey Over, State University of New York, Geneseo, N.Y.; Maya Elrick, University of New Mexico, Albuquerque, N.Mex. ORAL and POSTER

T29. The Use of Molecular Techniques to Assess Microbial Community Structure and Function in Aquifer Systems
GSA Geobiology and Geomicrobiology Division; GSA Hydrogeology Division
Geomicrobiology; Environmental Geoscience; Hydrogeology
Johanna V. Weiss, U.S. Geological Survey, Reston, Va.; Isabelle M. Cozzarelli, U.S. Geological Survey, Reston, Va.; Brian Mailloux, Barnard College, New York, N.C. ORAL and POSTER

T30. Quaternary Micropaleontology: Quantifying Environmental Change
Cushman Foundation; GSA Geobiology and Geomicrobiology Division
Geomicrobiology; Quaternary Geology/Geomorphology; Environmental Geoscience
Benjamin P. Horton, University of Pennsylvania, Philadelphia, Pa.; Robin J. Edwards, Trinity College Dublin, Dublin, Ireland. ORAL and POSTER

T31. Geomorphology and Hydrology of Montane Tropical Streams
GSA Quaternary Geology and Geomorphology Division; GSA Hydrogeology Division
Geomorphology; Hydrogeology; Environmental Geoscience
Fred N. Scatena, University of Pennsylvania, Philadelphia, Pa.; Fred L. Ogden, University of Wyoming, Laramie, Wyo. ORAL and POSTER

T32. Linking Sediment Dynamics and Geomorphology in Tidal Marshes and Estuaries
GSA Sedimentary Geology Division
Geomorphology; Marine/Coastal Science; Sediments, Clastic
Christopher Sommerfield, University of Delaware, Lewes, Del.; Raymond Torres, University of South Carolina, Columbia, S.C. ORAL and POSTER

T33. The Impact of Climate Change on Hydrologic and Geomorphic Processes in the Arctic and Subarctic
GSA Quaternary Geology and Geomorphology Division
Geomorphology; Paleoclimatology/Paleoceanography
Joan Ramage, Lehigh University, Bethlehem, Pa.; Rose McKenney, Pacific Lutheran University, Tacoma, Wash. ORAL and POSTER

PENROSE CONFERENCE SERIES

Tectonics, Climate, and Landscape Evolution

Edited by Sean D. Willett, Niels Hovius, Mark T. Brandon, and Donald M. Fisher

The Liwu River runs a short course; its channel head at the water divide in Taiwan's Central Range is a mere 35 km from its outflow into the Pacific Ocean. But in those short 35 km, the Liwu has carved one of the world's geographic wonders: the spectacular Taroko Gorge with marble and granite walls soaring nearly 1000 m above the river channel. Taroko Gorge was a fitting venue for a 2003 Penrose Conference that addressed the coupled processes of tectonics, climate, and landscape evolution. The young mountains, extreme weather, and dramatic landforms provided an appropriate backdrop to wide-ranging discussions of geomorphic processes, climate and meteorology, sediment generation and transport, the effects of erosion on tectonics, and new analytical and modeling tools used to address these processes and problems. This volume's papers extend that discussion, reaching across fields that have experienced rapid advances in the past decade.

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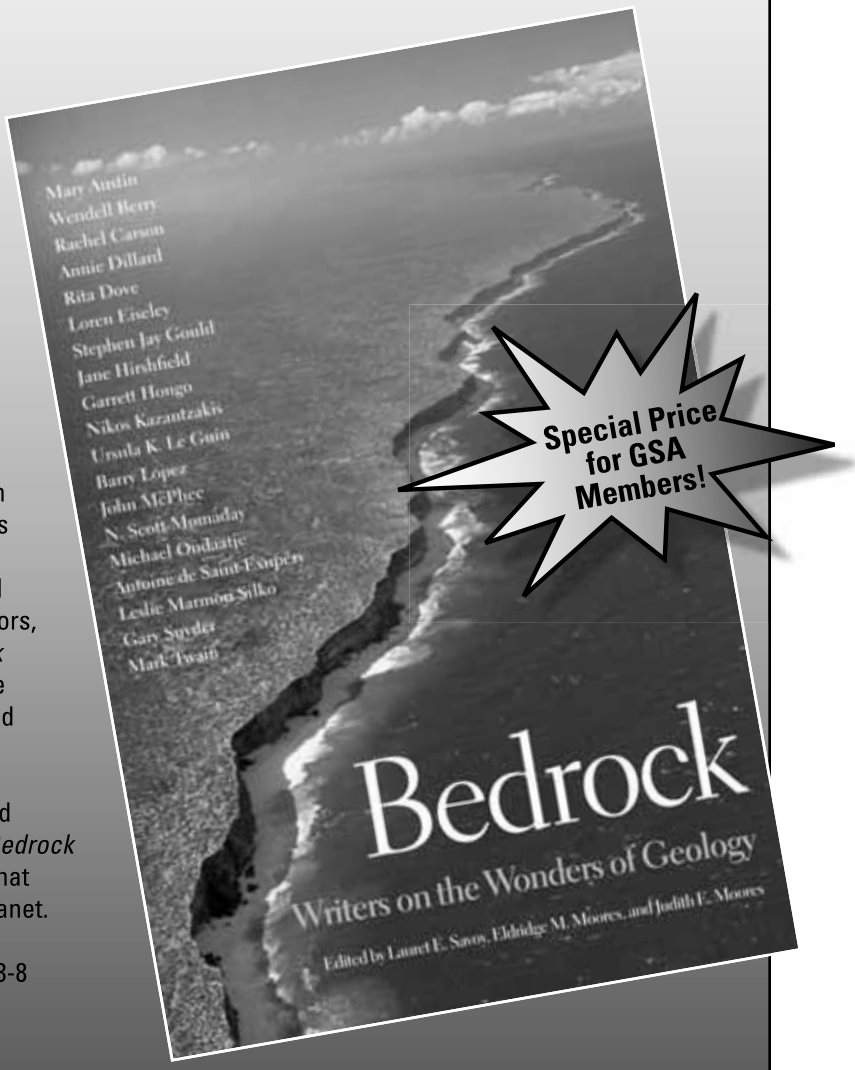

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T109. Mass Extinctions: New Approaches Analyzing Process Links between Land and Sea
Paleontological Society; GSA Geobiology and Geomicrobiology Division
Paleontology, Diversity, Extinction, Origination; Paleoclimatology/Paleoceanography; Geochemistry, Other
David J. Bottjer, University of Southern California, Los Angeles, Calif.; Peter D. Ward, University of Washington, Seattle, Wash. ORAL

T110. Magnetostratigraphy of Critical Intervals in Earth History: Contributions to Geochronology, Geobiology, Paleogeography, and Global Change
GSA Geophysics Division; GSA Sedimentary Geology Division; GSA Geobiology and Geomicrobiology Division; Society for Sedimentary Geology (SEPM)
Paleontology, Diversity, Extinction, Origination; Paleontology, Biogeography/Biostratigraphy; Geophysics/Tectonophysics/Seismology
Timothy D. Raub, Yale University, New Haven, Conn.; Adam C. Maloof, Princeton University, Princeton, N.J. ORAL and POSTER

T111. The Late Cretaceous–Early Tertiary Interval in the Atlantic Coastal Plain
Paleontological Society
Paleontology, Diversity, Extinction, Origination; Paleontology, Paleoecology/Taphonomy; Stratigraphy
William B. Gallagher, New Jersey State Museum, Trenton, N.J.; Kenneth J. Lacovara, Drexel University, Philadelphia, Pa. ORAL

T112. Extinction, Dwarfing, and the Lilliput Effect
Paleontological Society
Paleontology, Diversity, Extinction, Origination; Paleontology, Phylogenetic/Morphological Patterns; Paleontology, Biogeography/Biostratigraphy
Richard J. Twitchett, University of Plymouth, Plymouth, UK; Bridget S. Wade, Rutgers, The State University of New Jersey, New Brunswick, N.J. ORAL and POSTER

T113. Applied Reef Coral Paleoecology
Paleontological Society
Paleontology, Paleoecology/Taphonomy; Paleontology, Biogeography/Biostratigraphy; Marine/Coastal Science
Benjamin J. Greenstein, Cornell College, Mount Vernon, Iowa. ORAL

T114. The Dynamic Reef and Shelly Communities of the Paleozoic: A Tribute to the Research Career of Paul Copper
Paleontological Society
Paleontology, Paleoecology/Taphonomy; Paleontology, Diversity, Extinction, Origination; Paleontology, Biogeography/Biostratigraphy
Leif Tapanila, Idaho State University, Pocatello, Idaho; Jisuo Jin, University of Western Ontario, London, Ontario. ORAL and POSTER

T115. Fossil Behavior: In Honor of Adolf Seilacher
Paleontological Society
Paleontology, Paleoecology/Taphonomy; Paleontology, Phylogenetic/Morphological Patterns; Paleontology, Diversity, Extinction, Origination
A.A. Ekdale, University of Utah, Salt Lake City, Utah; Richard G. Bromley, Copenhagen University, Denmark. ORAL and POSTER

T116. Trilobite Paleobiology and Evolution: In Honor of Brian Chatterton
Paleontological Society
Paleontology, Phylogenetic/Morphological Patterns; Paleontology, Diversity, Extinction, Origination; Paleontology, Paleoecology/Taphonomy
Brenda R. Hunda, Cincinnati Museum Center, Cincinnati, Ohio; Mark Webster, University of Chicago, Chicago, Ill. ORAL

T117. Life on Late Devonian Continents—Organisms and Ecosystems in Transition: In Honor of James Richard "Dick" Beerbower
Paleontological Society
Paleontology/Paleobotany; Paleontology, Diversity, Extinction, Origination; Paleoclimatology/Paleoceanography
Edward B. Daeschler, Academy of Natural Sciences, Philadelphia, Pa.; Walter L. Cressler, West Chester University, West Chester, Pa. ORAL

T118. Biotic Response to Global Environmental Change: Analogs for the Future of Life on Earth
Paleontological Society
Paleontology/Paleobotany; Paleontology, Paleoecology/Taphonomy; Paleontology, Diversity, Extinction, Origination
Margaret L. Fraiser, University of Wisconsin, Milwaukee, Wis. ORAL

T119. Crustal Melt Flow in Orogenic Belts: Integrated Field, Microstructural, Geochemical, and Geochronological Analysis of Migmatites and Associated Granites
Mineralogical Society of America
Petrology, Igneous; Structural Geology; Geochemistry, Other
Paul B. Tomascak, State University of New York, Oswego, N.Y.; Gary S. Solar, State University of New York College, Buffalo, N.Y. ORAL and POSTER

T120. Minerals, Melts, Fluids, and the Evolution of Mountain Belts: A Tribute to Maria Luisa Crawford
Mineralogical Society of America
Petrology, Metamorphic; Structural Geology; Mineralogy/Crystallography
Jinny Sisson, Rice University, Houston, Tex.; Alice L. Hoersch, La Salle University, Philadelphia, Pa. ORAL and POSTER

T121. Impact Craters: Structures, Drilling, Ages, and Geophysics
GSA Planetary Geology Division; International Continental Scientific Drilling Program (ICDP); GSA Geophysics Division; GSA Structural Geology and Tectonics Division; GSA Sedimentary Geology Division
Planetary Geology; Structural Geology; Geophysics/Tectonophysics/Seismology
Christian Koeberl, University of Vienna, Vienna, Austria; Jared R. Morrow, University of Northern Colorado, Greeley, Colo. ORAL and POSTER

T122. Asteroids, Meteorites, and the Early History of the Solar System—G.K. Gilbert Award Session
GSA Planetary Geology Division
Planetary Geology

Thomas R. Watters, Smithsonian Institution, Washington, D.C.; Harry Y. McSween, University of Tennessee, Knoxville, Tenn. ORAL

T123. Geology, Health, and Public Policy
GSA Geology and Health Division; GSA Geology and Society Division; Public Policy
Public Policy; Environmental Geoscience
David W. Mogk, Montana State University, Bozeman, Mont.; Monica E. Gowan, Mayo Clinic, Rochester, Minn. ORAL and POSTER

T124. Forensic Geoscience from the Classroom to the Courtroom
GSA Geoscience Education Division
Public Policy; Geoscience Education; Environmental Geoscience
Elisa Bergslien, Buffalo State College, Buffalo, N.Y. ORAL and POSTER

T125. Keys to Opportunities with the National Park Service
National Park Service
Public Policy; Geoscience Information/Communication; Geoscience Education
Judy Geniac, National Park Service, Denver, Colo. ORAL

T126. Conservation and Management of Geoheritage Resources
GSA Geology and Society Division; GSA International Division; National Park Service; Public Policy
Public Policy; Geoscience Information/Communication
Robert D. Higgins, National Park Service, Denver, Colo.; Maurice J. Terman, Falls Church, Va. ORAL

T127. Scales of Instability in Tropical Environments
American Association of Stratigraphic Palynologists
Quaternary Geology; Environmental Geoscience; Paleontology, Paleoecology/Taphonomy
Christopher O. Hunt, Queen's University of Belfast, UK. ORAL

T128. Sources, Transport, Storage, and Delivery of Sediment in the Chesapeake Bay Watershed
GSA Quaternary Geology and Geomorphology Division
Quaternary Geology/Geomorphology; Geomorphology
Allen C. Gellis, U.S. Geological Survey, Baltimore, Md.; Dorothy Merritts, Franklin and Marshall College, Lancaster, Pa. ORAL and POSTER

T129. Geologic Mapping: Innovations and Interoperability (Posters)
GSA Geology and Society Division; GSA Quaternary Geology and Geomorphology Division; GSA Hydrogeology Division; GSA Structural Geology and Tectonics Division
Quaternary Geology/Geomorphology; Hydrogeology; Geoscience Information/Communication
Richard C. Berg, Illinois State Geological Survey, Champaign, Ill.; David R. Soller, U.S. Geological Survey, Reston, Va.; Peter T. Lyttle, U.S. Geological Survey, Reston, Va.; Thomas Berg, Ohio Geological Survey, Columbus, Ohio; Harvey Thorleifson, University of Minnesota, St. Paul, Minn.; Hazen Russell, Geological Survey of Canada, Ottawa, Ontario. POSTER

T130. Geologic Mapping and Minerals Exploration Using Remote Sensing Data
GSA Geophysics Division
Remote Sensing/Geographic Info System; Economic Geology
John C. Mars, U.S. Geological Survey, Reston, Va. ORAL

T131. Using Geographic Information Systems to Explore Geology and Health Relationships (Posters)
GSA Geology and Health Division
Remote Sensing/Geographic Info System; Environmental Geoscience
John Maclachlan, McMaster University, Hamilton, Ontario; David Mogk, Montana State University, Bozeman, Mont. POSTER

T132. A Visual Showcase for Diverse GIS Applications: A Cornucopia of Case Studies
GSA Geoscience Education Division
Remote Sensing/Geographic Info System; Geoscience Information/Communication; Geoscience Education
Richard B. Schultz, Elmhurst College, Elmhurst, Ill.; Mark R. Hafen, University of South Florida, Tampa, Fla. ORAL

T133. Late Permian–Early Triassic Earth
Paleontological Society
Sediments, Carbonates; Geochemistry, Other; Paleontology, Biogeography/Biostratigraphy
Ezat Heydari, Jackson State University, Jackson, Miss.; Thomas C. Wynn, Lock Haven University, Lock Haven, Pa. ORAL and POSTER

T134. Back to the Future of Sedimentary Geology: Student Research in Sedimentary Geology (Posters)
GSA Sedimentary Geology Division
Sediments, Carbonates; Sediments, Clastic; Stratigraphy
Daniel Larsen, University of Memphis, Memphis, Tenn. POSTER

T135. Forensic Geology
GSA Geology and Health Division; GSA Geology and Society Division
Sediments, Clastic; Geomorphology; Geochemistry, Other
Nehru E. Cherukupalli, City University of New York, Brooklyn, N.Y. ORAL and POSTER

T136. River Generated Hyperpycnal Events and Resulted Deposits in Modern and Ancient Environments
Sediments, Clastic; Marine/Coastal Science; Stratigraphy
Cornel Olariu, University of Texas, Austin, Tex.; Piret Plink Björklund, Göteborg University, Göteborg, Sweden. ORAL

T137. Epicontinental Seas in the Geological Record: The Limitations of the Uniformitarian Paradigm
Sediments, Clastic; Sediments, Carbonates; Paleoclimatology/Paleoceanography
Peter A. Allison, Imperial College, London, UK; Martin R. Wells, Imperial College, London, UK; Brian R. Pratt, University of Saskatchewan, Saskatoon, Saskatchewan. ORAL

T138. Using Detrital Zircon Geochronology to Answer Geologic Questions We Formerly Could Not Ask
GSA Sedimentary Geology Division; Society for Sedimentary Geology (SEPM)
Sediments, Clastic; Stratigraphy; Tectonics
Michael Pope, Washington State University, Pullman, Wash.; Paul Link, Idaho State University, Pocatello, Idaho. ORAL and POSTER

T139. Changes in Ocean and Atmospheric Redox State and the Evolution of Life
Paleontological Society; GSA Geobiology and Geomicrobiology Division
Stratigraphy; Geochemistry, Organic; Geomicrobiology
Ganqing Jiang, University of Nevada, Las Vegas, Nev.; Andrey Bekker, Carnegie Institution of Washington, Washington, D.C. ORAL and POSTER

T140. U.S. Atlantic and Gulf Margin Sequences and Hydrostratigraphy
Stratigraphy; Hydrogeology; Marine/Coastal Science
Peter J. Sugarman, New Jersey Geological Survey, Trenton, N.J.; Kenneth Miller, Rutgers University, Piscataway, N.J. ORAL and POSTER

T141. Spatial and Temporal Heterogeneity of Hypoxic-Anoxic Conditions in Mid-Cretaceous Deposits of the Tethyan Realm: Characterization and Paleoenvironmental Implications (Posters)
GSA Sedimentary Geology Division; Society for Sedimentary Geology (SEPM); GSA Geobiology and Geomicrobiology Division
Stratigraphy; Paleoclimatology/Paleoceanography; Geomicrobiology
Florentin J. Maurrasse, Florida International University, Miami, Fla.; Ricardo Barragan-Manzo, Universidad Nacional Autónoma de México (UNAM), Mexico City, México. POSTER

T142. Terrestrial Impact Breccias
GSA Planetary Geology Division; GSA Sedimentary Geology Division
Stratigraphy; Planetary Geology; Sediments, Clastic
David T. King Jr., Auburn University, Auburn, Ala.; Kevin Evans, Missouri State University, Springfield, Mo. ORAL and POSTER

T143. Outcrop Studies: Fundamental to Lithofacies and Reservoir Characterization
GSA Sedimentary Geology Division; American Association of Petroleum Geologists
Stratigraphy; Sediments, Clastic; Sediments, Carbonates
Ernest A. Mancini, University of Alabama, Tuscaloosa, Ala.; Jim Blankenship, American Association of Petroleum Geologists, Tulsa, Okla.; William C. Parcell, Wichita State University, Wichita, Kans. ORAL

T144. Deformation in Sedimentary Rocks: A Tribute to Richard H. Groshong Jr.
GSA Structural Geology and Tectonics Division
Structural Geology; Tectonics
David A. Ferrill, Southwest Research Institute, San Antonio, Tex. ORAL

T145. Unraveling Tectonics: The Power behind Balanced Cross Sections and Kinematic Reconstructions
GSA Structural Geology and Tectonics Division
Structural Geology; Tectonics; Geophysics/Tectonophysics/Seismology
Nadine McQuarrie, Princeton University, Princeton, N.J.; Delores Robinson, University of Alabama, Tuscaloosa, Ala. ORAL and POSTER

T146. Geoinformatics: Data to Knowledge about the Evolution of Continents
GSA Geophysics Division
Tectonics; Geophysics/Tectonophysics/Seismology; Petrology, Igneous
G. Randy Keller, University of Texas, El Paso, Tex.; A.K. Sinha, Virginia Tech, Blacksburg, Va. ORAL and POSTER

T147. National Science Foundation Continental Dynamics Field Laboratories: 20 Years On
Tectonics; Geophysics/Tectonophysics/Seismology; Structural Geology
Lincoln S. Hollister, Princeton University, Princeton, N.J.; G. Randy Keller, University of Texas, El Paso, Tex. ORAL

T148. Intraplate Earthquakes: Advances in Understanding Their Causes and the Hazard Posed by Them
GSA Structural Geology and Tectonics Division; GSA Geophysics Division; GSA Engineering Geology Division
Tectonics; Geophysics/Tectonophysics/Seismology; Neotectonics/Paleoseismology
Eugene Schweig, U.S. Geological Survey, Memphis, Tenn.; Pradeep Talwani, University of South Carolina, Columbia, S.C. ORAL and POSTER

T149. Modern to Precambrian Subduction Systems: Convergent Margin Behavior and Evolution over Geologic Time
GSA International Division; GSA Structural Geology and Tectonics Division; GSA Geophysics Division; GSA Sedimentary Geology Division; Integrated Ocean Drilling Program, MARGINS
Tectonics; Petrology, Metamorphic; Petrology, Igneous
Yildirim Dilek, Miami University, Oxford, Ohio; Mark Cloos, University of Texas, Austin, Tex. ORAL

T150. Understanding Mountain Belts from Basin-Fill: Multidisciplinary Approaches to the Detrital Record of Orogenic Evolution
Tectonics; Stratigraphy; Sediments, Clastic
Andrea Fildani, ChevronTexaco, San Ramon, Calif.; Tim Cope, DePauw University, Greencastle, Ind.; Amy Weislogel, Stanford University, Stanford, Calif. ORAL and POSTER

T151. Orogenesis in the Northwestern Appalachians
Tectonics; Structural Geology; Stratigraphy
Paul A. Washington, University of Louisiana, Monroe, La. ORAL

T152. Spreading the Message: New Developments in the Presentation and Visualization of 3D and 4D Geological Data and Processes
GSA Structural Geology and Tectonics Division; GSA Geoscience Education Division
Tectonics; Structural Geology; Geoscience Education
Steven J. Whitmeyer, James Madison University, Harrisonburg, Va.; Steve Reynolds, Arizona State University, Tempe, Ariz.; Ken McCaffrey, University of Durham, Durham, UK; Jonathan Imber, University of Durham, Durham, UK. ORAL and POSTER

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Paleontology, Diversity, Extinction, Origination
Paleontology, Paleoecology/Taphonomy
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Select your preferred mode of presentation: oral, poster, or either (no preference). **Please note:** The program organizers will do their best to fit you into your preferred mode; however, they will override your original mode selection if they feel your paper would fit well in a particular session with other compatible abstracts. The decision of the program organizers is final.

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JTPC to Finalize Program in Early August

The Joint Technical Program Committee (JTPC) selects abstracts and determines the final session schedule. All authors will be notified in August. The JTPC includes representatives from those GSA Associated Societies and Divisions participating in the technical program. GSA Council approved the JTPC technical program chairs.

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ROCK STARS

David White (1862–1935): Pioneer in Coal, Petroleum, and Paleobotanical Studies

Paul C. Lyons, *206 Amber Road, Middleboro, Massachusetts 02346, USA*

Elsie D. Morey, *2235 Baltimore Pike, Gettysburg, Pennsylvania 17325, USA*

David White, ca. 1912, about the time he became chief geologist of the U.S. Geological Survey.

David White rose from farm boy to teacher in rural New York, from assistant paleontologist to chief geologist in the U.S. Geological Survey (USGS), and then to president of the Geological Society of America. During his 49-year career with the USGS, he provided great leadership and earned acclaim in paleobotany and petroleum geology.

The Early Years

Charles David White was born on his father's farm near Palmyra, New York, on 1 July 1862. David, as he was known throughout his career, came under the influence of a young Dutch immigrant, Daniel van Cruyningham, who worked as a laborer on the White farm. Later, van Cruyningham became principal of the nearby Marion Collegiate where White enrolled, earning his way by farm work and teaching. Van Cruyningham encouraged White to study the flowering plants of the region.

White won a scholarship to Cornell and paid for his expenses mostly by teaching elementary drawing. His mentor at Cornell was Henry S. Williams (1847–1918), who is best known for proposing the "Pennsylvanian System." Williams knew of White's interest in flowering plants and suggested as his bachelor's thesis a study of the enigmatic Devonian plant fossil, *Ptilophyton*, not to be confused with *Psilophyton,* a primitive vine-like land plant. Williams was impressed by White's thesis and his finely executed line drawings.

In 1886, Lester F. Ward (1841–1913) of the USGS inquired of Williams if he had any students who could make accurate line drawings of plant fossils. Ward was working on Cretaceous floras of the western United States. Williams recommended White, who was hired by Ward at a salary of US$900 per annum (~US$45,000 in today's dollar).

When White began his career with the USGS in 1886, paleobotany was in its infancy in North America. The work of five paleobotanists on late Paleozoic floras, before White's contributions, deserves special mention: John S. Newberry (1822–1892) on Ohio floras (1856, 1873); William F. Fontaine and Israel C. White's controversial Dunkard floras (1880); the "Coal Flora" (1879–1883) of Leo Lesquereux (1806–1889); and the geological history of plant fossils (1888) by John W. Dawson (1820–1899). Lesquereux's work is widely considered the founding of paleobotany in North America.

In 1888, White married Mary Houghton of Worcester, Massachusetts, whom he had met at Cornell, where she was a student of literature and history. They lived in Washington, D.C., all their married years and did not have any children. When not burdened by administrative duties, White worked in the Appalachians and out West. He and Mary were also hosts to many people interested in geology, charity, and social service.

Early Career Highlights

On his own initiative and to the delight of Ward, White studied the flora of the Gay Head section, Martha's Vineyard, Massachusetts. This section was considered to be Tertiary by such notables as Charles Lyell on his 1841 visit to the United States. In a paper published in 1890, White established that the flora was of Middle Cretaceous age.

At Ward's suggestion, White reclassified some 100,000 specimens of Carboniferous plant fossils in the Ralph D. Lacoe Collection, which was donated to the U.S. National Museum in 1893. Lacoe was a businessman and amateur collector who had amassed a large collection of plant fossils. After going through the plant fossils in this collection, White was convinced that he could resolve stratigraphic uncertainties in the Pottsville Formation, a terrestrial Pennsylvanian sequence. In 1900, he published his work on the Pottsville floras, showing that his floral zones could be used to resolve stratigraphic uncertainties in various eastern states.

In 1897, White and Charles Schuchert were sent as part of Peary's Expedition to study a meteorite in Greenland. There they discovered what is now considered a classic Cretaceous flora locality.

In 1899, White essentially established modern correlations of the Pennsylvanian sequence with Europe. Although later workers made some refinement to these correlations, his floral zonations are benchmarks in the age and correlations of Pennsylvanian floras.

The work of White in the Anthracite region of eastern Pennsylvania, then the largest producer of coal in the country, led to the discovery by him of millions of tons of coal unknown to coal operators.

Botanist Reinhardt Theissen (1867–1938) was White's field assistant in the very early part of the twentieth century. Thiessen used the thin-section technique to study coal, a technique developed in England in the early 1800s. White and Thiessen studied the origin of coal; their book on coal (published in 1913) disproved the allochthonous origin of coal, the popular theory of the time.

White Discovers the "Death Line" of Petroleum

White was able to relate increasing fixed carbon in coal to an increasing degree of coalification and in 1913 demonstrated that petroleum was not likely to occur where the fixed carbon of coal exceeded 65% to 70% (i.e., that this was a "death line" for oil). This hypothesis and its application established White as an expert on oil and gas exploration. He considered his "carbon-ratio hypothesis" to be his greatest scientific contribution.

Also in 1913, after having been appointed chief geologist of the USGS, White initiated studies of the petroleum potential of the oil shales in the Eocene Green River Formation. White served as chief geologist during World War I and trained many geologists in petroleum geology, a notable proportion of whom became world leaders in this field after the war. White was a member of the War Minerals Committee and did research on oil shales as a possible source of gasoline. As a member of the National Academy of Sciences and the National Research Council, he promoted research on the origin of petroleum. White used gravity measurements to locate anticlines with petroleum. Under his leadership, the first estimates of the petroleum reserves of the United States were made, which led to a new search for petroleum.

People White Inspired

Although he had seemingly boundless energy, partly expressed by climbing stairs three at a time to get to his fourth-floor office at the U.S. National Museum, it was not all directed toward scientific and administrative matters. After the Russian Revolution of 1917 and while he was USGS chief geologist, he did his best to aid scientists who came to the United States. One of the scientists he helped was Taisia Stadnichenko, a brilliant Russian chemist whose career was wrecked by events in Russia. She was hired by White to assist him in his studies of oil shales. "Uncle David," as she affectionately called him, was her mentor at the USGS. They collaborated on several papers on oil shales.

White never missed an opportunity to inspire a young mind, pose a scientific problem, and guide a scientist to its solution. Two other examples of those he inspired and guided were the budding paleobotanists Charles B. Read (1907–1979) and William C. Darrah (1909–1989). Read, White's assistant, in collaboration with Sergius H. Mamay of the USGS, established the modern Carboniferous-Permian megafloral biostratigraphic scheme in 1964.

National Parks

During the late 1920s, White took great pride in the fact that he cooperated with the U.S. National Park Service and even wore its uniform while in the field (see photo below). In the Grand Canyon, in addition to studying Permian floras, White studied Precambrian beds with suspected algal remains.

Honors and Awards

David White never sought monetary rewards or honors of any kind. His many honors were graciously received when they came. His service to science, the country, and mankind were the driving forces of his life.

ACKNOWLEDGMENTS

Most of this account is taken from Lyons and Morey (1995). We thank J.D. Burgess and C.M. Nelson for reviews and Robert Ginsburg, Gerry Middleton, Ken Bork, Robert Dott, Jr., Jerry Winterer, and Peter von Bitter of the Rock Stars Committee for many helpful suggestions for its improvement.

FURTHER READING

Lyons, P.C., and Morey, E.D., 1995, David White (1862–1935): American paleobotanist and geologist, *in* Lyons, P.C., Morey, E.D., and Wagner, R.H., eds., Historical Perspectives of Early Twentieth Century Carboniferous Paleobotany in North America: Geological Society of America Memoir 185, p. 135–148.

Mendenhall, W.C., 1937, Memorial of David White: Geological Society of America, Proceedings for 1936, p. 271–292, plate 16.

"Rock Stars" is produced by the GSA History of Geology Division. Editorial Committee: Kennard Bork, Robert Dott, Robert Ginsburg, Gerard Middleton, Peter von Bitter, and E.L. (Jerry) Winterer.

White (left) and park naturalist Edwin McKee examining fossils, Grand Canyon National Park, 17 June 1929.

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Terms begin 1 July 2007 (unless otherwise indicated).

2007–2008 COMMITTEE VACANCIES

GSA is seeking candidates to serve on Society committees and as GSA representatives to other organizations. Contribute to our science by volunteering or nominating others you think should be considered for any of the following openings. Younger members are especially encouraged to become involved in Society activities. Graduate students are eligible to serve on GSA committees as full members, and Council encourages you to volunteer or nominate others for committee service. Whether you volunteer or make recommendations, please give serious consideration to the specified qualifications for serving on a particular committee. **Please be sure that your candidates are GSA Members or Fellows and that they fully meet the requested qualifications.**

You may now volunteer or nominate online! The nomination form and instructions are available at **www.geosociety.org/aboutus/commtees.** Click on "Nominate Online for 2007–2008" to access a secure form. If you prefer, you may download and complete a paper nomination form, also located on this Web site, and return it to Pamela Fistell, GSA, P.O. Box 9140, Boulder, CO 80301-9140, USA, fax +1-303-357-1070. For questions pertaining to nominations, please contact Pamela Fistell, pfistell@geosociety.org, +1-303-357-1000 ext. 0, +1-800-472-1988 ext. 0.

Nominations received at GSA headquarters by **1 August 2006** (on the official form) will be forwarded to the Committee on Nominations. Information provided on the form will assist the Committee members with their recommendations for the July 2007 committee vacancies. *Please use one form per candidate.* The committee will present at least two nominations for each open position to Council at its fall meeting. Appointees will then be contacted and asked to serve, thus completing the process of bringing new expertise into Society affairs.

ACADEMIC AND APPLIED GEOSCIENCE RELATIONS COMMITTEE (AM, T/E)—3-YEAR TERMS
Nine vacancies: eight member-at-large; one councilor/former councilor

Strengthens and expands relations between GSA members in the academic and applied geosciences. Proactively coordinates the Society's effort to facilitate greater cooperation between academia, industry, and government geoscientists. **Qualifications:** must be Members from academia, industry, or government who are committed to developing better integration of applied and academic science in our meetings, publications, short courses, field trips, and education and outreach programs.

ANNUAL PROGRAM COMMITTEE (AM, B/E, T/E)—4-YEAR TERMS
One Councilor/former Councilor vacancy

Develops a long-range plan for increasing the quality of the annual meeting and other Society-sponsored meetings in terms of science, education, and outreach. Evaluates the technical and scientific programs of the annual meeting. **Qualifications:** broad familiarity with different disciplines, previous program experience, or active involvement in applying geologic knowledge to benefit society and raise awareness of critical issues.

ARTHUR L. DAY MEDAL AWARD (T/E)—3-YEAR TERMS
Two member-at-large vacancies

Selects candidates for the Arthur L. Day Medal Award. **Qualifications:** knowledge of those who have made "distinct contributions to geologic knowledge through the application of physics and chemistry to the solution of geologic problems."

EDUCATION (AM, T/E)—4-YEAR TERMS
Three vacancies: one undergraduate level educator; one student representative; one member-at-large

Stimulates interest in the importance and acquisition of basic knowledge in the earth sciences at all levels of education and promotes the importance of earth science education to the general public. **Qualifications:** ability to work with other interested scientific organizations and science teacher groups to develop pre-college earth science education objectives and initiatives.

GEOLOGY AND PUBLIC POLICY (AM, B/E, T/E)—3-YEAR TERMS
One member-at-large vacancy

Translates knowledge of earth sciences into forms most useful for public discussion and decision making. **Qualifications:** experience in public policy issues involving the science of geology; ability to develop, disseminate, and translate information from the geologic sciences into useful forms for the general public and for GSA members; familiarity with appropriate techniques for the dissemination of information.

HONORARY FELLOWS (T/E)—3-YEAR TERMS
Two member-at-large vacancies

Selects candidates for Honorary Fellows, who are usually non–North Americans. **Qualifications:** knowledge of geologists throughout the world who have distinguished themselves through their contributions to earth science.

July 2007 Committee Vacancies • *Extensive time commitment required • AM—Meets at Annual Meeting
B/E—Meets in Boulder or elsewhere • T/E—Communicates by phone or electronically

JOINT TECHNICAL PROGRAM COMMITTEE (T/E)—3-YEAR TERMS
One marine/coastal geology representative *(term begins 1 January 2008)*

Assists in finalizing the technical program of the annual meeting; reviews abstracts or provides names of reviewers to evaluate abstracts, participates in Web-based activities in the selection and scheduling of abstracts, and participates in Topical Session proposal review. **Qualifications:** must be familiar with computers and the Web, be a specialist in one of the specified fields, and be available in mid- to late July for the organization of the electronic technical program.

MEMBERSHIP (B/E)—3-YEAR TERMS
Two member-at-large vacancies

Evaluates membership benefits and develops recommendations that address the changing needs of the membership and attracts new members.

MINORITIES AND WOMEN IN THE GEOSCIENCES (AM)—3-YEAR TERMS
Three member-at-large vacancies

Stimulates recruitment and promotes the positive career development of minorities and women in the geoscience professions. **Qualifications:** familiarity with the education and employment issues of minorities and women; expertise and leadership experience in such areas as human resources and education desired.

NOMINATIONS (B/E, T/E)—3-YEAR TERMS
Two member-at-large vacancies

Recommends nominees to Council for the positions of GSA Officers and Councilors, committee members, and Society representatives to other permanent groups. **Qualifications:** familiarity with a broad range of well-known and highly respected geoscientists.

PENROSE CONFERENCES AND FIELD FORUMS (T/E)—3-YEAR TERMS
Two member-at-large vacancies

Reviews and approves Penrose Conference proposals and recommends and implements guidelines for the success of the conferences. **Qualifications:** past convener of a Penrose Conference or Field Forum.

PENROSE MEDAL AWARD (T/E)—3-YEAR TERMS
Two member-at-large vacancies

Selects candidates for the Penrose Medal Award. Emphasis is placed on "eminent research in pure geology, which marks a major advance in the science of geology." **Qualifications:** familiarity with outstanding achievers in the geosciences who are worthy of consideration for the honor.

PROFESSIONAL DEVELOPMENT (T/E)—3-YEAR TERMS
Two vacancies: one student representative; one councilor/former councilor

Directs, advises, and monitors GSA's professional development program, reviews and approves proposals, recommends and implements guideline changes, and monitors the scientific quality of courses offered. **Qualifications:** familiarity with professional development programs or adult education teaching experience.

PUBLICATIONS (AM, B/E, T/E)—4-YEAR TERMS
One member-at-large vacancy

Nominates candidates for editor positions, approves editorial boards, reviews the quality and health of Society publications, and explores the initiation of new ventures, including electronic publishing. **Qualifications:** extensive publications experience. **Extensive time commitment.**

RESEARCH GRANTS* (B/E)—3-YEAR TERMS
Six member-at-large vacancies

Evaluates student research grant applications and selects grant recipients. **Qualifications:** should have experience in directing research projects and in evaluating research grant applications. **Extensive time commitment**.

***TREATISE ON INVERTEBRATE PALEONTOLOGY* ADVISORY COMMITTEE (AM)—3-YEAR TERMS**
One member-at-large vacancy (paleontologist)

Advises Council, the Committee on Publications, and the *Treatise* editor in matters of policy concerning this publication. **Qualifications:** must be a paleontologist.

YOUNG SCIENTIST AWARD (DONATH MEDAL) (T/E)—3-YEAR TERMS
Two vacancies: one member-at-large; one councilor/former councilor

Committee members investigate the achievements of young scientists who should be considered for this award and make recommendations to Council. **Qualifications:** knowledge of young scientists with "outstanding achievement(s) in contributing to geologic knowledge through original research which marks a major advance in the earth sciences."

GSA Representatives to Other Organizations:

GSA/AASG SELECTION COMMITTEE FOR THE JOHN C. FRYE MEMORIAL AWARD—3-YEAR TERMS
One GSA representative vacancy *(term: 1 July 2007–30 June 2010)*.

Annual award given to recognize the outstanding paper in environmental geology published by a state geological survey or GSA during the preceding three calendar years.

Committee, Section, and Division Volunteers: Council Thanks You!

The GSA Council acknowledges the many member-volunteers who, over the years, have contributed to the Society and to our science through involvement in the affairs of the GSA.

July 2007 Committee Vacancies • *Extensive time commitment required • AM—Meets at Annual Meeting B/E—Meets in Boulder or elsewhere • T/E—Communicates by phone or electronically

Feedbacks between Science and Policy: Do they exist?

Nicole Gasparini,
2005–2006 GSA–U.S. Geological Survey Congressional Science Fellow

I haven't actually done a poll, but I have a hunch that if I were to ask scientists about how policy affects science, every scientist would be quick to answer. Funding would probably be the first issue raised, as every scientist has felt the squeeze on national research budgets at some point in his or her career. Some scientists might also bring up visa limitations for foreign students. Others might talk about regulations that affect their work, from how to properly dispose of lab chemicals to limits on where they can camp and hit their hammers. When it comes to how policy affects science, my guess is that scientists would have no shortage of answers.

On the other hand, if I were to reverse the question and ask scientists about how science affects policy, I'm not sure how scientists would reply. I couldn't answer that question before I started my fellowship, but after a few months on Capitol Hill, I have a better idea about the role that science plays in shaping policy.

For example, a year ago I thought that the National Academy of Sciences (NAS) was solely an honorary society for the most distinguished scientists in our nation. It's true that the NAS is an esteemed honor society, but it also plays an important role in the policy process. Abraham Lincoln formed the NAS in 1863 to "investigate, examine, experiment, and report upon any subject of science or art" whenever called upon to do so by any department of the government. In 1916, the National Research Council (NRC) was founded to carry out studies mandated by the government. Scientists volunteer their time to participate in studies for the NRC. The Academies, made up of the NAS, NRC, the National Academy of Engineering, and the Institute of Medicine, play an important role in integrating science into public policy, while remaining independent of any government institution.

I was first introduced to an NAS report when I was asked to write an oversight letter about the radiation standards for Yucca Mountain. According to the Energy Policy Act of 1992, Yucca Mountain can only receive a license to store nuclear waste if it is in compliance with the Environmental Protection Agency (EPA) public health and safety standards. The law directed the EPA to set standards "based upon and consistent with the findings and recommendations of the National Academy of Sciences." In 1995, the NAS issued a report titled "Technical Bases for Yucca Mountain Standards" to guide the EPA.

The original EPA standards for Yucca Mountain set a 10,000 year compliance period for radiation protection. However, a ruling by the U.S. Court of Appeals found that this time frame of regulatory compliance was not consistent with the findings of the 1995 NAS report. In response to this ruling, the EPA recently issued a new draft of the radiation protection standards for Yucca Mountain, but my boss, Congressman Edward Markey, was concerned that the newly drafted guidelines were still inconsistent with the NAS findings. For example, in the new draft, groundwater protection standards are less stringent after 10,000 years even though the NAS report found that peak risks with respect to groundwater contamination "might occur tens to hundreds of thousands of years or even farther into the future." The oversight letter that Rep. Markey sent to the EPA points out the apparent conflicts between the EPA guidelines and the findings of the NAS.

Yucca Mountain has a long history. In 1957, the NAS determined that a geologic repository was the best way to protect the public and environment from the dangers of radioactive waste. In 1982, Congress enacted the Nuclear Waste Policy Act to solve the problem of nuclear waste disposal. In 1983, the Department of Energy chose nine locations in six states for consideration as potential waste facilities, including Yucca Mountain. Originally, the Nuclear Waste Policy Act stated that there would be two waste repositories, one east and one west of the Mississippi River. Transportation of nuclear waste poses a large safety hazard, and Congress determined that having two sites would reduce transportation safety risks. However, Congress amended the Nuclear Waste Policy Act in 1987, making Yucca Mountain the sole site under consideration for a geologic repository.

There are literally hundreds of reports from the National Academies Press on nuclear waste repositories and Yucca Mountain. Whether or not Congress acts based on the findings of these studies is of course up to every individual member of Congress. However, it is heartening to know that scientific studies have been carried out at seemingly every step of the way to help direct congressional decision making. I recently attended a hearing on the status of the Yucca Mountain project and couldn't help but smile when Rep. Markey said "we will not sacrifice sound science for political expediency."

The National Academies are not the only scientific influence on policy. Scientists employed by policy organizations, such as the Federation of American Scientists, the Union of Concerned Scientists, and the Natural Resources Defense Council, also play a role in educating congressional staff. My office works closely with many different science policy groups and welcomes their scientific knowledge, since it would be impossible for any single congressional staffer to thoroughly research

every policy issue. Scientists from these organizations become a resource for staffers, and they are often called upon to testify at hearings and briefings.

Private scientists also visit our office and play a role in educating congressional staff. Some scientists come as part of congressional visits organized by a scientific association, while others contact us individually because they are in our district or believe that our office may support their cause. These scientists often ask us to cosponsor legislation or sign a letter in support of a project, but many times these scientists just want to keep us informed.

I always enjoy meeting with other scientists, and I appreciate seeing science from "the other side." I recently met a seismologist who receives funding from the Air Force Seismic Monitoring Program, which supports research to improve the military's capability to detect clandestine nuclear explosions. My own Ph.D. was partially funded by the Army Research Office, so I am keenly aware of the intersection between basic science and military needs. However, members of Congress often need to be reminded of the practical applications of basic research in order to justify continued spending.

I am happy to report that science does play a role in policy decisions on Capitol Hill, at least in the office of Congressman Ed Markey. Communicating scientific findings to my boss can be a challenge, but it's also my favorite part of the job, and it may be the most valuable lesson I learn this year.

This manuscript is submitted for publication by Nicole Gasparini, 2005–2006 GSA–U.S. Geological Survey Congressional Science Fellow, with the understanding that the U.S. government is authorized to reproduce and distribute reprints for governmental use. The one-year fellowship is supported by GSA and by the U.S. Geological Survey, Department of the Interior, under Assistance Award No. 05HQGR0141. The views and conclusions contained in this document are those of the author and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. government. *Gasparini can be reached at nicole.gasparini@yale.edu.*

October in the northeastern United States: Fall colors in the Appalachians are readily visible throughout central Pennsylvania. True-color image taken 28 October 2004 by the Moderate Resolution Imaging Spectroradiometer (MODIS) on the National Aeronautics and Space Administration's *Aqua* satellite. Image courtesy Visible Earth, http://visibleearth.nasa.gov/view_rec.php?id=6742. See the Philadelphia meeting pages in this issue for more about visiting this area.

FIELD FORUM SCHEDULED

Estero Molino south.

Assessing the state of our knowledge of continental arc volcanism: The Tatara–San Pedro complex, 36ES, Chilean Southern Volcanic Zone

3–13 February 2007

Talca, Chile

Conveners:

Mike Dungan, *Section of Earth Sciences, University of Geneva, 13 rue des Maraîchers, Geneva 1205, Switzerland, michael.dungan@terre.unige.ch*

Daniel Sellés, *Section of Earth Sciences, University of Geneva, 13 rue des Maraîchers, Geneva 1205, Switzerland*

Carolina Rodríguez, *Section of Earth Sciences, University of Geneva, 13 rue des Maraîchers, Geneva 1205, Switzerland*

José Antonio Naranjo, *SERNAGEOMIN, Av. Santa María 0104, Santiago, Chile, jnaranjo@sernageomin.cl*

Rebecca Lange, *Department of Geological Sciences, University of Michigan, Ann Arbor, Michigan 48109, USA, becky@umich.edu*

John Pallister, *U.S. Geological Survey, Cascade Volcano Observatory, Vancouver, Washington 98683, USA, jpallist@usgs.gov*

Ren Thompson, *U.S. Geological Survey, MS-913, Denver Federal Center, Denver, Colorado 80225, USA, rathomps@usgs.gov*

Fidel Costa, *CSIC, Jaume Almera Institute of Earth Sciences, Barcelona, Spain, fidel.costa-rodriguez@ruhr-uni-bochum.de*

Description: Knowledge of the long-term magmatic and structural evolution of large arc volcanic edifices is essential for a range of problems from risk assessment to the geodynamics of subduction zones. The purpose of this Field Forum is to evaluate our understanding of magma evolution and transport at long-lived continental arc systems and how such insights can be integrated with the resolution obtained from real-time observations of active systems. What levels of sampling density, stratigraphic control, and geochronological resolution are essential to obtaining quantitatively reliable results from volcanologic and petrologic studies? What are the underlying causes of short-term and long-term parental magma diversity at single edifices, and how can we definitively separate pristine mantle geochemical signals from open-system overprints? What factors combine to cause temporal changes in differentiation mechanisms and trends, conduit and magma reservoir geometry, and edifice stability? Over what time scales do such variations occur? This forum will assemble a group of participants with the experience sufficient to articulate the state of our knowledge with regard to arc volcanism, to identify outstanding problems, and to propose concrete solutions for filling existing gaps. The spectacularly exposed Quaternary Tatara–San Pedro complex will serve to bring these issues into focus during a five-day field excursion. Papers (syntheses, reviews, and new results) contributed by participants on these topics will be published as a monograph.

Outline: Two half-days of helicopter-assisted ridge-hopping will provide an overview of the volcanic system (intrusive roots to late Holocene flows and sector collapse debris avalanches), and two and a half days will be spent on the ground examining well-studied lavas and xenoliths. Logistical constraints limit participation to 36 people, including organizers. Pre-excursion presentations will combine preparation for the excursion, exposés

of other arc volcanic centers, and debates on the underlying issues. A post-excursion discussion, catalyzed by confronting the geology and petrology of the Tatara–San Pedro complex, will be organized to address relevant issues pertaining to how such edifices can be efficiently studied, plus where and how current paradigms concerning arc magmatism can be tested.

Itinerary, Venue, and Logistics

3–4 Feb.: Arrival in Talca, Chile (3.5 hr in transit by bus from Santiago).

5–6 Feb.: Presentations and discussions in Talca.

7 Feb.: Morning—helicopter tour of the north flank of the system. Afternoon—walk 3 km to camp, with stops to view lavas and crustal xenoliths.

8 Feb.: Helicopter tour of the south side of the Tatara–San Pedro complex–late Holocene San Pedro lavas and included crustal xenoliths, plus sector collapses and avalanche debris deposits.

9–10 Feb.: All-day walking tours to assess volcanic stratigraphy and examine mafic lavas.

11 Feb.: Break camp and walk to the road (7 hr).

12 Feb.: Summary discussion session and banquet.

13 Feb.: Departure.

Participants will provide field and camping equipment and conform to strict rules with regard to maximum weight and volume. There will be three and a half days of demanding hiking over steep, rugged terrain (maximum elevation on foot of ~3000 m). Our responses to special dietary needs will be limited by the need to prepare meals on campfires.

Cost Per Person: The total cost of the Field Forum will be roughly US$1600 to US$2000. We will have a more definitive estimate in November 2006. A deposit of US$800 will be required before 30 September 2006, and the remaining fees are due before 1 January 2007. Some financial aid will be available for young scientists and those in the Latin American community.

Application Deadline: 1 August 2006

Interested individuals should send a paragraph, by 1 August 2006, to Mike Dungan (michael.dungan@terre.unige.ch) describing their motivation for attending, what they could contribute to discussions and to the monograph, and whether or not they can pay some or all registration and travel costs. Organizers will contact selected participants, including those on the waiting list, in late August.

Registrants with Special Needs: If you require special arrangements or have special dietary concerns, please contact one of the conveners. However, applicants should keep in mind the physical demands inherent in the planned excursion.

ANNOUNCEMENTS

MEETINGS CALENDAR

2006

24–27 July	Western Pacific Geophysical Meeting, Beijing, China. **Information:** www.agu.org/meetings/wp06/.
27–31 August	3rd International Symposium on Isotopomers (ISI 2006), San Diego, California, USA. **Information:** http://isi2006.ucsd.edu/.

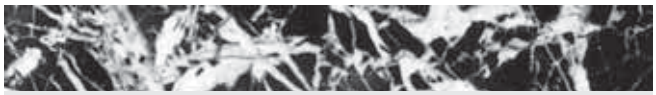
2007

22–25 January	Fourth International Conference on Remediation of Contaminated Sediments, Savannah, Georgia, USA. **Information:** www.battelle.org/environment/er/conferences/sedimentscon/default.stm.
28–31 January	33rd Annual Conference of the International Society of Explosives Engineers, Nashville, Tennessee, USA. **Information:** www.isee.org.
5–9 March	Second Alexander von Humboldt International Conference on the role of geophysics in natural disaster prevention, Lima, Peru. **Information:** http://www.pages.unibe.ch/calendar/2007/2nd_AvH_Circular1.pdf.
19–23 March	Second International Conference on the Geology of the Tethys, Giza, Egypt. **Information:** El Sayed Abd El Aziz Aly Youssef, Geology Department, Faculty of Science, Cairo University, Giza, Egypt, fax: 002 02 5728843; phone: 002 02 5676887 or 002 012 2926034; e-mail: elsayedyoussef2005@yahoo.com, elsayedyoussef@internetmisr.net, or elsayedyoussef@hotmail.com.
13–17 May	Coastal Sediments 2007, New Orleans, Louisiana, USA. **Information:** www.asce.org/conferences/cs07/index.cfm.

Visit www.geosociety.org/calendar/for a complete list of upcoming geoscience meetings.

About People

GSA Senior Fellow **Walter Alvarez** was awarded the Desert Research Institute's (DRI) 2006 Nevada Medal on 9 March 2006 in Las Vegas, Nevada. The Nevada Medal was established in 1988 to recognize outstanding national and international science, engineering, or science in industry. Alvarez is the 2002 GSA Penrose Medalist.



IN MEMORIAM

David F. Barnes
San Carlos, California
17 December 2005

Donald H. Cadwell
Albany, New York
1 January 2006

Bruce C. Corliss
Bay City, Michigan
7 January 2004

Donald P. Elston
Flagstaff, Arizona
14 February 2006

Ronald F. Emslie
Ottawa, Ontario
Notified 16 January 2006

Luna B. Leopold
Berkeley, California
23 February 2006
former GSA President, 1972

William W. Lomerson
Natchitoches, Louisiana
Notified 9 January 2006

John C. Maxwell
Austin, Texas
23 January 2006
former GSA President, 1973

Bill J. McGrew
Columbia, Tennessee
Notified 20 January 2006

Gordon W. Prescott
Concord, North Carolina
21 February 2006

Eugene C. Robertson
Reston, Virginia
Notified 31 January 2006

Nicholas J. Shackleton
Cambridge, UK
24 January 2006

Jack A. Simon
Urbana, Illinois
17 December 2005

John B. Squyres
Littleton, Colorado
Notified 28 February 2006

Robert H. Stebbins
Richmond, Virginia
1 February 2006

Mortimer D. Turner
Boulder, Colorado
1 May 2004

Aiyun Zhang
Beijing, China
5 March 2006

Please contact the GSA Foundation at +1-303-357-1054 or drussell@geosociety.org for information on contributing to the Memorial Fund.

Note: The "In Memoriam" section of the March 2006 issue of *GSA Today* (p. 27) erroneously listed **Richard E. Ernst** as deceased. Dr. Ernst lives and runs a consulting business in Ottawa, Ontario.

SEEKING SECTION MEETING HOSTS

GSA Section meetings are excellent venues for interdisciplinary science. They are an important hub for discussing and presenting current research and for networking with professionals and students. They provide an excellent opportunity for students to attend and participate in technical sessions, field trips, and short courses close to their schools.

The health of GSA Sections depends on many willing hands. GSA Headquarters now offers significant assistance with the logistical responsibilities of Section meetings, so chairs are able to spend more time developing the scientific program.

If you would like to bring a GSA Section meeting to your location, please refer to the table below for current openings and take a moment to contact the appropriate Section secretary to discuss what hosting a meeting entails. Section geographic boundaries are shown at www.geosociety.org/sectdiv/. Information on recent and upcoming Section meetings is available at http://www.geosociety.org/sectdiv/sections.htm.

SECTION MEETINGS

Section	2007	2008	2009	2010
Northeastern Stephen Pollock pollock@usm.maine.edu	Durham, New Hampshire	**open**	**open**	Joint meeting NE-SE Sections, **location open**
North-Central Joseph Hannibal jhanniba@cmnh.org	Lawrence, Kansas (joint with South-Central Section)	Evansville, Indiana	**open**	**open**
Southeastern Donald Neal neald@mail.ecu.edu	Savannah, Georgia	Charlotte, North Carolina	Tampa, Florida (tentative)	Joint meeting NE-SE Sections, **location open**
South-Central Matthew Totten mtotten@ksu.edu	Lawrence, Kansas (joint with North-Central Section)	Hot Springs, Arkansas (tentative)	Dallas, Texas (tentative)	**open**
Rocky Mountain Kenneth Kolm kkolm@bbl-inc.com	St. George, Utah (tentative)	**open**	Provo, Utah	**open**
Cordilleran Joan Fryxell jfryxell@csusb.edu	Bellingham, Washington	Las Vegas, Nevada	**open**	Fullerton, California

The Kerry Kelts Research Awards of the Limnogeology Division

The application process for the Kerry Kelts Research Awards of the Limnogeology Division is now open. These awards are named in honor of Kerry Kelts, a visionary limnogeologist and inspiring teacher. Up to three awards of US$300 each for use in research related to limnogeology, limnology, and paleolimnology are available. Application for this award is simple and consists of a summary of the proposed research, its significance, and how the award will be used (five-page maximum). Please send your summary in PDF format along with your name and associated information to the chair of the Limnogeology Division, Thomas C. Johnson, tcj@d.umn.edu. **Application Deadline: 10 August 2006.** Awards will be announced at the Limnogeology Division Business Meeting and Reception at the 2006 GSA Annual Meeting in Philadelphia in October.

We hope to increase the amount of the awards in succeeding years. If you are interested in supporting this awards program, please send your donations, designated for the Kerry Kelts Research Awards of the Limnogeology Division, to GSA, P.O. Box 9140, Boulder, CO 80301-9140, USA.

GeoVentures™ 2006

Want to find out about all our latest GeoVentures™ trips? Join our GeoVentures™ E-News list! See our Web page, www.geosociety.org/geoventures.

PARIS–DIJON GEOTRIP™ RESCHEDULED

New dates: Sun., 27 Aug.–Sat., 2 Sept. 2006. There's still time to register and join us on this adventure to retrace Henry Darcy's hydrogeology legacy through Paris and Dijon.

Henry Darcy's Legacy in Dijon and Paris: Public Fountains and the Railroad

27 Aug.–2 Sept. 2006 *new dates*
Paris and Dijon, France
(7 days, 6 nights)
Deposit due: 20 June

Scientific Leader:

Patricia Bobeck is a geologist and the translator of Henry Darcy's *Public Fountains of the City of Dijon*. Bobeck studied in France and Switzerland while completing an undergraduate degree in French and later received a master's degree in linguistics from the University of Michigan. After teaching languages in South America and Hawaii, she obtained her master's degree in geology from the University of Texas. She now works for the state of Texas in groundwater remediation. In addition, she is certified by the American Translators Association as a French-to-English translator. In 2004, the American Foundation for Translation and Interpretation awarded her the inaugural S. Edmund Berger Prize for Excellence in Scientific and Technical Translation for the translation of the Darcy book.

Description

Henry Darcy founded the science of hydrogeology when he published "Darcy's Law" in an appendix of his 1856 book *Les Fontaines publiques de la ville de Dijon*. This trip begins with a visit to the location of Darcy's workshop in Paris, where he conducted his pipe-flow experiments. We will also visit the Musée des Egouts (Sewer Museum) for a first-hand look at the "tout-à-l'égout," the combined sanitary and storm sewer system that was being built during Darcy's tenure in Paris as superintendent of municipal services. After a day in Paris, we will take the TGV (Train de Grande Vitesse [high speed train]) to Dijon. In Dijon, we will visit Place Darcy, where the aqueduct empties into the first of two reservoirs Darcy constructed. We will walk the extent of Darcy's cast-iron pipe water supply system in old Dijon and see the Montsouris Reservoir, the end of Darcy's distribution system. Traveling outside Dijon, we will visit the Rosoir spring that still supplies Dijon's water. We will also go to Blaisy Haut, the mountaintop above the Blaisy Tunnel, which was Darcy's worksite while he supervised the tunnel's construction. While touring Burgundy, we will stop at the Chateau de Bourbilly, a thirteenth century castle owned by Darcy's descendants that is open for visitors in the summer. In Beaune, we will enjoy the Burgundy tradition of wine tasting!

See the GSA Web site for a daily itinerary and tour details: www.geosociety.org/geoVentures/professionals/2006/GT_france_itin.htm.

Accessibility

GSA is committed to making activities accessible to all people interested in attending. Please contact Wesley Hill, whill@geosociety.org, if you have any special requirements.

Fees and Payment

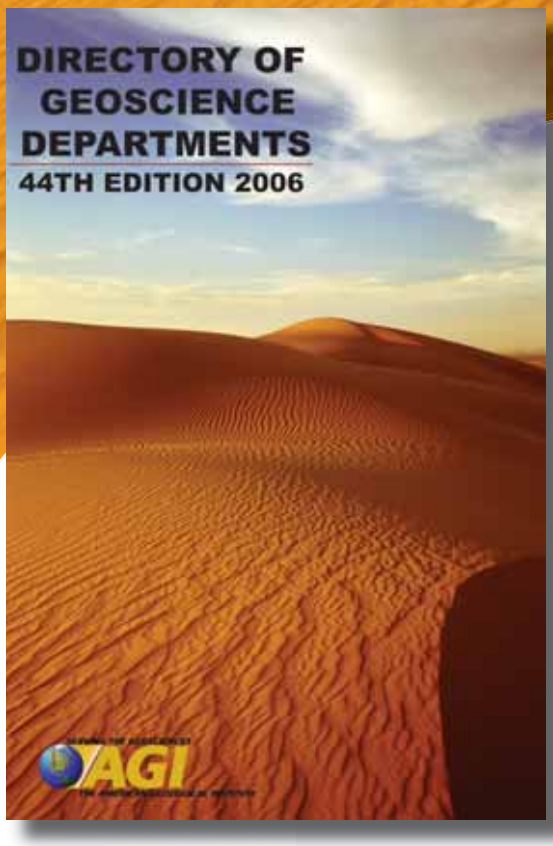
GSA Members, US$2,400; nonmembers, US$2,500; add US$400 for a single room. A US$300 deposit is due with your reservation and is refundable through **20 June,** less a US$50 processing fee. The balance is due **23 June 2006.** Min.: 20; max.: 25. **Included:** *The Public Fountains of the City of Dijon*, lodging for six nights (double occupancy), local transportation, sightseeing tickets, train tickets between Paris and Dijon, all breakfasts, most lunches, and most dinners, and a one-day central zone metro pass in Paris. **Not included:** Air transportation to and from Paris, transfer from the airport to our Paris hotel, optional activities, alcoholic beverages, personal travel insurance, and other expenses not specifically included.

You'll find your registration form online at www.geosociety.org/geoVentures/. Please complete and return the registration form with your deposit. Contact Wesley Hill if you have any questions: whill@geosociety.org, or +1-303-357-1005. **NOTE:** It is advised that you wait to purchase your airline tickets until GSA confirms that the tour will run.

Directory of Geoscience Departments

44th edition - 2006

Christopher M. Keane
Cynthia M. Martinez



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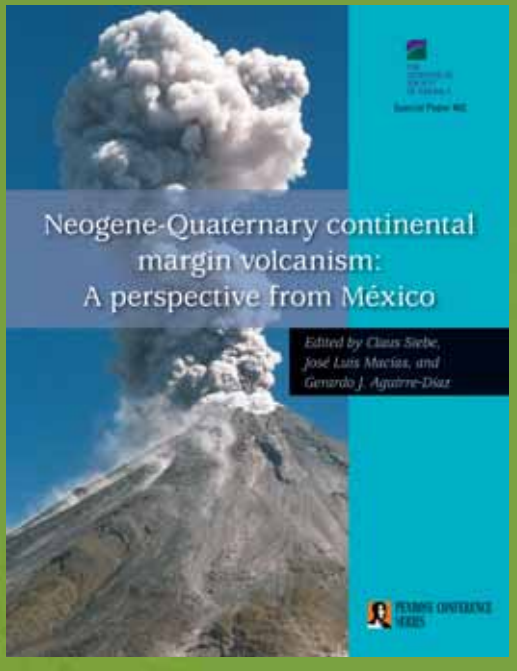

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