GSA TODAY

Seattle 2003 Call for Papers!

VOL. 13, No. 4/5 A PUBLICATION OF THE GEOLOGICAL SOCIETY OF AMERICA APRIL/MAY 2003

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GSA TODAY

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COVER
Nisqually Glacier at Mount Rainier National Park, Washington. Photo by John Karachewski.

Seattle 2003 GSA Annual Meeting & Exposition
Call for Papers

Geoscience Horizons: Seattle 2003

GSA Annual Meeting & Exposition

November 2–5, 2003

Washington State Convention & Trade Center, Seattle

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Greetings!

Multifaceted Seattle provides a fascinating arena for the GSA Annual Meeting. Seattle is an amazing place—aesthetically, culturally, and geologically. In few other North American cities do Holocene lahars lap up against the downtown shopping district, active surface faults bisect half-billion-dollar sports stadiums, glacial fjords float ten thousand commuters daily to their climate-controlled office buildings, and recent landslides the size of small New England townships provide home to million-dollar views for software executives and coffee moguls. If you've never been to Seattle, come to experience a place, for better or worse, like none other. If you know the city like the back of your hand, revisit old friends and resample the local beverages. For the rest of you, enjoy the continuing evolution of one of the most unique cities, and settings, of our continent.

Geoscience Horizons: Seattle 2003 promises to be an exciting meeting. There's a great set of field trips and workshops, technical sessions, and the opportunity to make or renew collegial connections. The meeting has a broad range of sessions that both encompass and expand the boundaries of traditional "geologic" studies. So, examine the session titles, find your niche, and offer your contribution by submitting an abstract. If you don't find your topic area, please submit to one of the general sessions—your session-mates may well be the most eclectic, creative group at the meeting. Come to Seattle and experience the beautiful "Emerald City."

Derek Booth
General Chair, Seattle Local Committee

IMPORTANT DATES, EVENTS, & DEADLINES

Registration Opens:	June 2
Abstracts Deadline:	July 15
Preregistration Deadline:	September 26
Registration Cancellation Deadline:	October 3
Premeeting Field Trips:	Sun.–Sat., Oct. 26–Nov. 1
Short Courses & Workshops:	Sat., Nov. 1
K–16 Workshops:	Sat.–Sun., Nov. 1–2
Presidential Address & Awards Ceremony:	Sun., Nov. 2, 4–6 p.m.
Welcoming Party & Exhibits Opening:	Sun., Nov. 2, 6–8 p.m.
Technical Program:	Sun.–Wed., Nov. 2–5
Pardee Keynote Symposia:	Sun., Nov. 2, 8 a.m.–noon Mon.–Wed., Nov. 3–5, 8 a.m.–noon, & 1:30–5:30 p.m.
Private Alumni Receptions:	Mon., Nov. 3, 5:30 p.m.–1 a.m.
Group Alumni Party:	Mon., Nov. 3, 7–9:30 p.m.
Exhibits Open:	Mon.–Tue., Nov. 3–4, 9:30 a.m.–5:30 p.m.
Exhibits Close: NEW!	Wed., Nov. 5, 2 p.m.
Hot Topics:	Mon.–Wed., Nov. 3–5, over lunchtime
Postmeeting Field Trips:	Wed.–Sat., Nov. 5–8

Associated Societies

American Association of Stratigraphic Palynologists ■ American Institute of Professional Geologists
Association for Women Geologists ■ Association of American State Geologists ■ Association of Earth Science Editors
Association of Engineering Geologists ■ Association of Geoscientists for International Development
Council on Undergraduate Research, Geosciences Division ■ Cushman Foundation
Environmental & Engineering Geophysical Society
Geochemical Society ■ Geoscience Information Society ■ History of the Earth Sciences Society
International Association of Hydrogeologists ■ Mineralogical Society of America
National Association for Black Geologists and Geophysicists
National Association of Geoscience Teachers ■ National Earth Science Teachers Association
National Ground Water Association ■ Paleontological Research Institution ■ Paleontological Society
Sigma Gamma Epsilon
Society for Sedimentary Geology ■ Society of Economic Geologists ■ Society of Vertebrate Paleontology

Allied Societies

American Association of Petroleum Geologists ■ Asociación Geológica Argentina ■ Geological Association of Canada
Geological Society of Australia ■ Geological Society of London ■ Geological Society of South Africa
Soil Science Society of America

GSA Welcomes These New Associated and Allied Societies

GSA ASSOCIATED SOCIETY

Environmental & Engineering Geophysical Society (www.eegs.org)

GSA ALLIED SOCIETIES

Geological Association of Canada (www.gac.ca)

Geological Society of South Africa (www.gssa.org.za)

Soil Science Society of America (www.soils.org)

Attention All GSA Associated Society and GSA Division Leaders:

Did you ever wait until the last minute to plan an event only to find out no meeting space was available?

You can avoid panic and frustration by planning now for your business meeting, alumni party, reception, banquet, or social event at the Seattle GSA Annual Meeting. To reserve space for your event at the headquarters hotel or at the convention center, make your plans NOW and complete the Meeting Space Request form online.

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Thank you!

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 issue topics 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 seven Pardee Keynote sessions were reviewed and accepted by the Annual Program Committee. *(All speakers are invited.)*

P1 Global Climate Changes: Abrupt Late Pleistocene Climatic Reversals and Modern Global Warming

GSA Quaternary Geology and Geomorphology Division

Don J. Easterbrook, Western Washington University, Bellingham, WA; Ed Evenson, Lehigh University, Bethlehem, PA; John Gosse, Dalhousie University, Halifax, NS, Canada

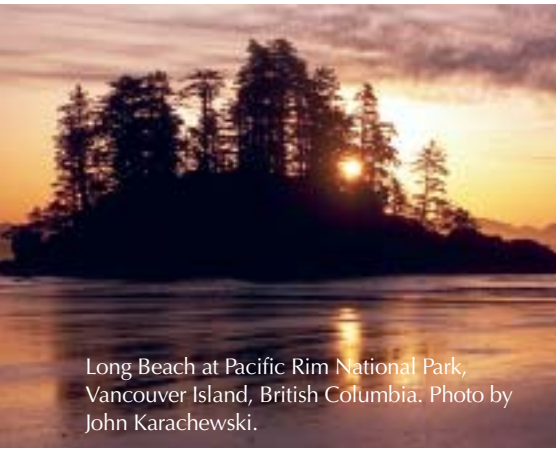
This session will explore global, late Pleistocene, rapid climatic changes, focusing on the Younger Dryas and Intra-Allerod Cold Period, and aspects of global warming during the past century and earlier natural climatic changes.

P2 His View of Life: Reflections on the Scientific Legacy of Stephen J. Gould

Paleontological Society

Warren D. Allmon, Paleontological Research Institution, Ithaca, NY; Patricia Kelley, University of North Carolina, Wilmington, NC; Robert M. Ross, Paleontological Research Institution, Ithaca, NY

This session will explore the legacy of Stephen Jay Gould. Speakers will reflect upon and attempt to clarify Gould's views, some of which were widely misunderstood, and explicate interrelationships among his views in disparate subjects.



Long Beach at Pacific Rim National Park, Vancouver Island, British Columbia. Photo by John Karachewski.

P3 Modeling Metamorphism: Petrology, Geochemistry, and Tectonics

Mineralogical Society of America, Geochemical Society; GSA Structural Geology and Tectonics Division

Michael Brown, University of Maryland, College Park, MD; Barbara L. Dutrow, Louisiana State University, Baton Rouge, LA

Metamorphism involves the study of global-scale cycles, for example, from diagenesis to exhumation of metamorphic rocks, and from ocean floor sedimentation to formation of mountain belts and global climate change. This session addresses a broad theme that is fundamental for mineralogy, petrology, geochemistry, tectonics and earth system science.

P4 Neoproterozoic Geobiology: Fossils, Clocks, Isotopes, and Rocks

GSA Geobiology and Geomicrobiology Division; Paleontological Society; Geochemical Society; Precambrian (at large)

Shuhai Xiao, Tulane University, New Orleans, LA; Alan J. Kaufman, University of Maryland, College Park, MD

Sedimentologists, paleontologists, geochemists, and earth system modelers are brought together to present new data and models (stimulated by the "snowball Earth" hypothesis) on the Neoproterozoic Earth, in order to better understand the relationship between tectonic, climatic, and biological change at the end of the Proterozoic Eon.

P5 Preservation of Random Megascale Events on Mars and Earth: Influence on Geologic History

GSA Planetary Geology Division

Mary G. Chapman, U.S. Geological Survey, Flagstaff, AZ; Lawrence H. Tanner, Bloomsburg University, Bloomsburg, PA

This session presents the state of our understanding of large-scale, rapid-acting geologic processes, such as bolide impact, superplume eruption, catastrophic flood, and edifice collapse that are obvious on Mars yet scarcely recognized on Earth.

P6 The Paleoenvironmental and Paleoclimatic Framework of Human Evolution

GSA Archaeological Geology Division, GSA Quaternary Geology and Geomorphology Division; GSA Sedimentary Geology Division; Society for Sedimentary Geology (SEPM)

Gail M. Ashley, Rutgers University, Piscataway, NJ; Craig S. Feibel, Rutgers State University, New Brunswick, NJ

Recent discoveries and established facts regarding the paleoenvironment and paleoclimatic context of human evolution will be examined with the goal of shedding some light on the puzzle of human origins.

P7 The Science of Lewis and Clark: Historical Observations and Modern Interpretations

GSA Engineering Geology Division; U.S. Geological Survey; U.S. Department of the Interior; GSA History of Geology Division; History of Earth Science Society

Paul M. Santi, Colorado School of Mines, Golden, CO

The year 2003 is the 200th anniversary of the initiation of the Lewis and Clark Expedition. This session will gather scientists, historians, and science policy makers to explore the scientific impacts of the expedition as well as the changes in scientific interpretations and government support of science since the expedition.

TOPICAL & DISCIPLINE SESSIONS

INVITED AND VOLUNTEERED PAPERS

ABSTRACTS DEADLINE: JULY 15

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: JULY 15

Please use the online electronic abstract form at www.geosociety.org. An abstract submission fee will be charged. The fee is $18 for all students; $30 for all others. If you cannot submit your abstract electronically, contact Nancy Carlson, (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 fit best. Joint Technical Program Committee representatives organize the papers in sessions focused on disciplines (e.g., environmental geoscience or mineralogy).

TOPICAL SESSIONS

T1 The Peopling of the New World: Geology, Archaeology, and Paleoenvironments

GSA Archaeological Geology Division; GSA Quaternary Geology and Geomorphology Division; Society for American Archaeology

Archaeological Geology; Quaternary Geology/Geomorphology; Paleoclimatology/Paleoceanography

Vance T. Holliday, University of Arizona, Tucson, AZ

The session will focus on the environments, landscapes, and archaeology of North and South America in the late Pleistocene (ca. 30,000–10,000 years B.P.) as they relate to the earliest arrival of humans on both continents. ORAL

T2 Geoarchaeology of Historic and Urban Sites

GSA Archaeological Geology Division

Archaeological Geology; Quaternary Geology/Geomorphology; Engineering Geology

David L. Cremeens, GAI Consultants, Inc., Monroeville, PA; Julie K. Stein, University of Washington, Seattle, WA

The goal of the session is to bring together geoarchaeologists, historical archaeologists, and historians to discuss geoarchaeological concepts and practices as applied to historic and urban archaeological sites. ORAL

T3 Impending Disaster—The Impact of Population Growth on Water Availability and Quality

U.S. National Committee for the Geological Sciences; U.S. National Committee for Geodesy and Geophysics; GSA Geology and Public Policy Committee; GSA Hydrogeology Division

Environmental Geoscience; Engineering Geology; Hydrogeology

Grant Heiken, Los Alamos National Lab, Los Alamos, NM; Patrick Leahy, U.S. Geological Survey, Reston, VA; Farouk El-Baz, Boston University, Boston, MA

This session will provide the framework in which geoscientists work to support supplies of potable water to the world's cities. ORAL

T4 Mathematical Modeling of Earth Surface Processes: The Good, the Bad, and the Ugly

Environmental Geoscience; Engineering Geology; Public Policy

Robert S. Young, Western Carolina University, Cullowhee, NC; Orrin H. Pilkey, Duke University, Durham, NC

Mathematical models are heavily relied upon for public policy decision making, but decision makers are often unaware of model shortcomings. This session aims to provide a forum for discussion of similar problems in widely varying fields, approaches for overcoming model shortcomings, and practical limits of model applications. ORAL

T5 Terroir, Geology, and Wine: A Tribute to Simon J. Haynes

Society of Economic Geologists

Economic Geology; Quaternary Geology/Geomorphology; Remote Sensing/Geographic Info System

Lawrence D. Meinert, Washington State University, Pullman, WA

Papers are encouraged on any aspect of Terroir—the interplay of wine and geology, including the impact of soils, bedrock, hydrology, GIS, and climatology. This session follows a premeeting field trip to examine outstanding vineyards, wineries, and terroir of Washington State. ORAL

T6 Geology of Salmon

Environmental Geoscience; Quaternary Geology/Geomorphology; Paleontology/Paleobotany

David R. Montgomery, University of Washington, Seattle, WA

The geology of salmon ranges from paleontological evidence for their evolution and radiation to changes in their abundance due to climate change and habitat loss, and the role of geomorphological disturbance processes in population dynamics. ORAL

T7 Geologists in the U.S. Peace Corps: The Contribution of Peace Corps Geologists to International Development and the Contribution of the Peace Corps Experience to the Development of the Geosciences in America

GSA International Division; Association of Geoscientists for International Development; U.S. Peace Corps; Ghana Geological Survey; U.S. Geological Survey

Public Policy

Robert A. Levich, Las Vegas, NV; R. Stephen Saunders, NASA, Arlington, VA; Ernest W. Kendall, Seabrook, TX

Contributions of American Peace Corps geologists to developing nations and the international community and the effect of Peace Corps service on the careers of American geologists and the geologic profession. This session will also explore whether the U.S. Peace Corps should continue to send geologists to serve in the developing world. ORAL

T8 The Role of Geology in the Management of Public and Private Western Temperate Forest Lands

GSA Quaternary Geology and Geomorphology Division; GSA Engineering Geology Division

Quaternary Geology/Geomorphology; Engineering Geology; Environmental Geoscience

Wendy J. Gerstel, Washington State Department of Natural Resources, Olympia, WA; Matthew J. Brunengo, Portland, OR

This session assembles current research and case studies on the application of geologic and geomorphic mapping and modeling as tools in habitat assessment and locating and designing structures, recreational facilities, and resource extraction activities on forested lands. ORAL and POSTER

T9 The Proposed Deep Geologic Repository for High-Level Radioactive Waste at Yucca Mountain, Nevada: Attributes of the Natural System

U.S. Department of Energy

Public Policy; Environmental Geoscience

Ronald M. Linden, Las Vegas, NV; Robert A. Levich, Las Vegas, NV; Ardyth Simmons, Lawrence Berkeley National Lab, Berkeley, CA

Aspects of the natural system relevant to the siting and safe operation of the proposed high-level waste repository at Yucca Mountain, Nevada. Topics include regional geology, site geology, tectonics and tectonic hazards, climate, unsaturated zone hydrology, saturated zone hydrology, rock geochemistry, and factors affecting radionuclide transport. ORAL

T10 Mega-Events on Earth and Mars: Record, Recognition, and Consequences (Posters)

GSA Structural Geology and Tectonics Division

Planetary Geology; Volcanology; Quaternary Geology/Geomorphology

Lawrence H. Tanner, Bloomsburg University, Bloomsburg, PA; Thorvaldur Thordarson, University of Hawaii, Honolulu, HI

This poster session explores large-scale, rapid-acting geologic processes that are obvious on Mars, yet scarcely recognized on Earth, and their influence on planetary history. Examples include bolide impact, superplume eruption, catastrophic flood, and edifice collapse. POSTER

T11 Expanding Extraterrestrial Geoscience Horizons: Planetary Remote Sensing

GSA Planetary Geology Division

Planetary Geology; Remote Sensing/Geographic Info System; Geochemistry, Other

Michael S. Kelley, Georgia Southern University, Statesboro, GA

A diverse group of leading planetary geologists who do not typically attend the same sessions will discuss problems, solutions, and results from remote sensing of solid planetary bodies. ORAL

T12 Advances in Analytical Techniques and New Approaches to the Study of Ore Deposits

Society of Economic Geologists

Economic Geology; Geochemistry, Aqueous; Geochemistry, Other

Werner Halter, ETH Zurich, Zurich, Switzerland; Thomas Pettke, ETH Zurich, Zurich, Switzerland

This session will focus on recent advances in analytical techniques (e.g., laser-ablation, MC-ICPMS, Raman, SIMS, SXRF) that provide new insight into the study of ore deposits. Submissions are encouraged on the analytical techniques themselves as well as the results of their use in experimental, microanalytical, and field studies. ORAL and POSTER

T13 Cathodoluminescence of Quartz in Hydrothermal Ore Deposits

Society of Economic Geologists

Economic Geology; Geochemistry, Aqueous; Geochemistry, Other

Brian Rusk, University of Oregon, Eugene, OR

Cathodoluminescence of quartz reveals textures that yield insight into the physical and chemical processes of ore deposit formation. These textures are even more insightful when combined with fluid inclusion petrography, ore mineral petrography, trace element analysis, or other analytical methods. ORAL and POSTER

T14 Modern and Ancient Mineralizing Seafloor Hydrothermal Systems

Society of Economic Geologists

Economic Geology; Marine/Coastal Science; Geochemistry, Other

J. Bruce Gemmell, University of Tasmania, Tasmania, Australia; Cornel E.J. de Ronde, Institute of Geological & Nuclear Sciences, Lower Hutt, New Zealand

Compare modern submarine mineralizing systems in a variety of plate tectonic settings (e.g., back arcs, intra-oceanic

and island arcs, seamounts, sediment free ridges, sedimented ridges) to ancient volcanic- and sediment-hosted ore deposits. ORAL

T15 Characterizing Complexity in Geomechanics, Engineering Geology, and Hydrogeology

GSA Engineering Geology Division

Engineering Geology; Hydrogeology; Structural Geology

William C. Haneberg, Haneberg Geoscience, Port Orchard, WA; Edmund Medley, Exponent® Failure Analysis Associates, Menlo Park, CA

Geomechanical and hydrogeological characterization of fault and fracture systems, mélanges, landslides, tills, and other strongly heterogeneous or anisotropic geomaterials. Quantitative probabilistic or process-based modeling contributions, field studies, and laboratory investigations are encouraged. ORAL

T16 Deep Rock Slope Deformation: Mechanics, Processes, and Timing

GSA Engineering Geology Division

Engineering Geology; Quaternary Geology/Geomorphology

James P. McCalpin, Crestone, CO; Stephen G. Evans, Geological Survey of Canada, Ottawa, ON

New advances have been made in the study of deep rock slope deformation (DRSD) by trenching of sackungen in USA and Europe and new discontinuous element models. ORAL and POSTER

T17 Advances and Applications of 3-D Fracture Analysis to Rock Mechanics and Engineering Geology

GSA Engineering Geology Division, American Rock Mechanics Association (ARMA); GSA Structural Geology and Tectonics Division

Engineering Geology; Structural Geology; Hydrogeology

Judy Ehlen, USA Engineer Research and Development Center, Alexandria, VA; Paul La Pointe, Golder Associates, Inc., Redmond, WA

In this session we propose to bring together those working on these various aspects of 3-D fracture characterization and synthesis to present their current work as it impacts structural geology, engineering geology, and hydrogeology. ORAL

T18 Impacts of Hydrostratigraphy on Engineering and Civil Works Projects in the Pacific Northwest

GSA Hydrogeology Division; GSA Engineering Geology Division

Hydrogeology; Stratigraphy

Richard J. Martin, Shannon & Wilson, Inc., Seattle, WA; Scott W. Gaulke, Shannon & Wilson, Inc., Seattle, WA

This session will provide an opportunity for practitioners to discuss local and regional hydrostratigraphic conditions in the Pacific Northwest including Washington, Oregon, Idaho, and British Columbia. ORAL

T19 Biogeochemical and Physical Processes in Mine Pit Lakes

GSA Limnogeology Division

Geochemistry, Aqueous; Environmental Geoscience; Hydrogeology

Laurie Balistrieri, Seattle, WA; Gina Tempel, Reno, NV; John Crusius, Woods Hole, MA

This session will explore variations in the biogeochemical and physical processes operating in mine pit lakes found in a variety of geological settings and approaches for modeling their water quality as a function of time. ORAL and POSTER

T20 Widespread Importance of Immiscible H_2O-CO_2 Fluids for Petrologic and Geochemical Processes in Low-to-Moderate Temperature Crustal Environments

Geochemical Society

Geochemistry, Aqueous; Petrology, Metamorphic; Geochemistry, Other

John P. Kaszuba, Los Alamos National Lab, Los Alamos, NM; David R. Janecky, Los Alamos National Lab, Los Alamos, NM

Geochemical reaction models include CO_2 as a major ligand and precipitate, but have generally neglected multiphase fluid implications. This session is intended to explore and contrast the evidence and behavior of high CO_2 natural systems. ORAL and POSTER

T21 Geochemistry for Technogenesis

Environmental Geoscience; Geochemistry, Aqueous; Geochemistry, Organic

Viktor V. Dolin, Institute for Environmental Geochemistry, Kyiv, Ukraine; Reto Gieré, Purdue University, West Lafayette, IN; James Morris, University of South Carolina, SC

Technogeneous impact on the geochemical media. Biogeochemical cycles of pollutants. Natural attenuation. Human-caused changes of natural isotopic ratios, global carbon cycle. Application of geochemistry for thermodynamic modeling, prediction of man-caused ecosystems development, assessment of health hazards, and countermeasures against pollution. ORAL

T22 Working at the Interface of Isotope Geochemistry and Ecology: A Rapidly Growing Discipline (Posters)

GSA Geobiology and Geomicrobiology Division; U.S. Geological Survey

Environmental Geoscience; Geochemistry, Organic; Geoscience Information/Communication

Adrian Farmer, U.S. Geological Survey, Fort Collins, CO; Elisabeth Brouwers, U.S. Geological Survey, Denver, CO

Biologists and geoscientists are applying stable isotopes to revolutionize ecological studies. These collaborative efforts bring new insights and identify new study areas in both disciplines. This session will focus on cutting-edge techniques and applications to understand current limitations and identify future research priorities and directions. POSTER

T23 Ecological Stoichiometry: Elemental Cycling and Biogeochemical Interactions in Ecosystem Processes

GSA Geobiology and Geomicrobiology Division, U.S. Geological Survey

Environmental Geoscience; Geochemistry, Other; Geomicrobiology

Elisabeth Brouwers, U.S. Geological Survey, Denver, CO; Jill Baron, U.S. Geological Survey, Fort Collins, CO; Ann Kinsinger, U.S. Geological Survey, Seattle, WA

Ecologists and biogeochemists are using principles of elemental interactions to understand the relationship between organisms and their environment. These relationships are complicated by the impacts of human activities. This session will utilize an element-scale approach to explore the linkages between organisms and their physical environment. ORAL

T24 On the Forefront of Terrestrial and Marine Organic Geochemistry: A Tribute to John I. Hedges

Geochemical Society; American Chemical Society; Geochemical Division

Geochemistry, Organic; Geochemistry, Other; Paleoclimatology/Paleoceanography

Stephen A. Macko, University of Virginia, Charlottesville, VA; Peggy Ostrom, Michigan State University, East Lansing, MI

This session is held in recognition of the diverse, extensive, and challenging research of John Hedges. ORAL

T25 Hydrogen in Biogeochemical Systems

Geochemical Society, Organic Geochemistry Division

Geochemistry, Organic; Geomicrobiology; Geochemistry, Aqueous

Michael J. Whiticar, University of Victoria, Victoria, BC; Alex L. Sessions, Woods Hole Oceanographic Institution, Woods Hole, MA

Hydrogen is the most abundant element in organic matter. This session explores advances in understanding processes, interactions, and systematics associated with the distribution of hydrogen in geomicrobial, biogeochemical, and petroleum systems. Compound-specific measurements of stable hydrogen isotopes by CF-IRMS are particularly emphasized. ORAL

T26 Computerized Modeling of Petroleum Systems and Paleohydrology

Geochemical Society

Geochemistry, Organic; Hydrogeology; Geochemistry, Aqueous

Kenneth E. Peters, U.S. Geological Survey, Menlo Park, CA; Martin B. Goldhaber, U.S. Geological Survey, Denver, CO

Computerized modeling can be used to reconstruct the temperature and fluid-flow histories of stratigraphic horizons. Our session provides a timely update of concepts and methods for modeling petroleum systems and groundwater or hydrothermal flow. ORAL

T27 Cutting Edge and "Vintage" Geochemistry: Celebrating the Science and Life of Glenn Goodfriend

GSA Quaternary Geology and Geomorphology Division, GSA Archaeological Geology Division; Geochemical Society; Paleontological Society

Geochemistry, Organic; Quaternary Geology/Geomorphology; Marine/Coastal Science

Bonnie A.B. Blackwell, Williams College, Williamstown, MA; Paul Goldberg, Boston University, Boston, MA; Julie Brigham-Grette, University of Massachusetts, Amherst, MA

To honor Glenn Goodfriend's memory, we will extoll his many interdisciplinary scientific contributions and toast his life. ORAL and POSTER

T28 Great Ideas for Problem-Based Instruction and Assessment in the Undergraduate Geosciences (Posters)

National Association of Geoscience Teachers; GSA Geoscience Education Division

Geoscience Education

Thomas J. Hollis, Cuesta College and Atascadero High School, San Luis Obispo, CA

Problem-based instruction and assessment involves providing students with basic data and having them develop and analyze the data and provide interpretation. This poster session showcases original, problem-based geoscience exercises. Attending geoscience instructors will be able to gather original, classroom-tested ideas and materials. POSTER

T29 In Our Own Backyards: Undergraduate Research in a Local Context (Posters)

Council on Undergraduate Research, Geosciences Division

Geoscience Education

Edward C. Hansen, Hope College, Holland, MI; Karen H. Fryer, Ohio Wesleyan University, Delaware, OH

Are there advantages to involving undergraduates in local research problems? What makes such projects successful? How can they be developed and funded? These and similar questions will be addressed in posters highlighting research with a community, campus, or other local emphasis. POSTER

T30 Large Intro Courses That Work: Sharing Exciting and Effective Teaching Strategies (Posters)

National Association of Geoscience Teachers; GSA Geoscience Education Division

Geoscience Education

Eric Butler, University of Vermont, Burlington, VT; Paul Bierman, University of Vermont, Burlington, VT

Large introductory geoscience courses are a challenge for faculty who wish to make such courses as interesting, relevant, and

useful to students as possible. Participants will draw on personal experience and/or educational research to present innovative, effective ways to make large geoscience classes stimulating and worthwhile for students. POSTER

T31 Subliminal and Intentional Outreach: Educating the General Public about Geological Sciences Through Novels, Film, TV, and Other Public Media

GSA Geoscience Education Division, National Association of Geoscience Teachers

Geoscience Education

Bonnie A.B. Blackwell, Williams College, Williamstown, MA

This session will explore how authors and scriptwriters who write major works involving geologists or geological topics, and the people who aid them, research and develop their geological theme. ORAL

T32 Using Data to Teach Earth Processes: An Illustrated Community Discussion (Posters). Special Session in Support of the NAGT/DLESE "On the Cutting Edge" Program

National Association of Geoscience Teachers

Geoscience Education

David W. Mogk, Montana State University, Bozeman, MT; Cathryn A. Manduca, Carleton College

Presentations will demonstrate effective use of geoscience data in a variety of instructional settings. All contributions will present learning goals, choice of datasets, tools for accessing and rendering data, evaluation strategies, and example outcome. Those submitting abstracts to this session will have the one-abstract rule waived and will be asked to use a common poster format and to post their work at the "On the Cutting Edge" Web site for broad dissemination. For more information, see http://serc.carleton.edu/NAGTWorkshops/. POSTER

T33 Beyond Google: Strategies for Developing Information-Literate Geoscience Students (Posters)

National Association of Geoscience Teachers

Geoscience Education; Geoscience Information/Communication

R. Heather Macdonald, College of William and Mary, Williamsburg, VA; Barbara J. DeFelice, Dartmouth College, Hanover, NH; Karen K. Berquist, College of William and Mary, Williamsburg, VA

Information literacy includes both critical assessment and familiarity with resources in many formats, and is a key skill for success in many fields. Geoscience information professionals and faculty share ideas, assignments, instructional approaches, and tools for developing information literacy skills through a course or a curriculum. POSTER

T34 Building the Digital Library for Earth System Education (DLESE): New Opportunities for Collaboration

National Association of Geoscience Teachers

Geoscience Education; Geoscience Information/Communication

Ed Geary, Colorado State University, Fort Collins, CO; Rajul Pandya, DLESE Program Center, Boulder, CO

The Digital Library for Earth System Education (DLESE) is a community-led effort that provides access to high-quality digital resources about Earth. This session will describe library development and highlight opportunities for collaboration. ORAL

T35 Geoscience Innovation Fostering the Achievement of All Students: Curriculum and Pedagogy Methods Reform, Universal Design Principles, and Applications

GSA Geoscience Education Division; Council of Undergraduate Research; National Association of Geoscience Teachers

Geoscience Education; Geoscience Information/Communication; Public Policy

Wendi J.W. Williams, University of Arkansas, Little Rock, AR; Roderic Brame, Wright State University, Dayton, OH; Pranoti M. Asher, Georgia Southern University, Statesboro, GA

Most postsecondary schools require completion of laboratory science core courses. This session will bring together geoscientists to explore K–20 curriculum and adaptations through applying universal design principles that make science learning more equitable for all students. ORAL

T36 Overcoming Obstacles to Incorporating Experiential Learning into the Undergraduate Geoscience Curriculum

Geoscience Education; Geoscience Information/Communication; Public Policy

Robert C. Thomas, University of Montana—Western, Dillon, MT; Sheila M. Roberts

This session will focus on how professors are overcoming obstacles to incorporating experiential learning into the geoscience curriculum. Obstacles may include scheduling, funding, legal issues, student culture, land access, student disabilities, community attitudes, and others. ORAL

T37 Teaching Local Geology: A NAGT Session In Honor of Robert Christman

National Association of Geoscience Teachers

Geoscience Education; Geoscience Information/Communication; Public Policy

Andrew Buddington, Spokane Community College, Spokane, WA; Rob Viens, Bellevue Community College, Bellevue, WA

The session invites earth science instructors to present teaching techniques and methods that highlight local geology and geologic history and supplement the broader approach taken by introductory geology textbooks. ORAL

T38 Volunteering in K–12 Settings

GSA Geoscience Education Division; National Association of Geoscience Teachers

Geoscience Education; Geoscience Information/Communication; Public Policy

Elizabeth Wright, School of the Art Institute of Chicago, Chicago, IL; William Slattery, Wright State University, Dayton, OH

Most of us are asked occasionally to share our expertise with a K–12 teacher, student, or class in the form of class presentations, field trips, tutoring, judging science fairs, or other activities. We welcome examples of creative volunteer activities and programs that engage K–12 teachers and/or students and that may be exported to other venues. ORAL

T39 History and Future of the Relationship Between the Geosciences and Religion: Litigation, Education, Reconciliation?

Geoscience Education; History of Geology; Paleontology/Paleobotany

John F. Bratton, U.S. Geological Survey, Woods Hole, MA

Do you have experience in the evolution-creation wars? This session will examine how they started, major battles, and what hope there is for peace in the near future. Presentations by scientists (religious or not), educators, historians, and theologians are welcome. ORAL and POSTER

T40 Workforce and Education: Building the Industry-Academia Connection in Developing a Capable and Sufficient Science and Technology Workforce

Geoscience Education; Public Policy; Geoscience Information/Communication

Marilyn J. Suiter, National Science Foundation, Arlington, VA; Richard M. Taber, National Science Foundation, Arlington, VA

This session will provide information on enrollment and degrees and employment trends in science and technology, with focus on the geosciences. Exemplary training methods, successful collaborations that lead to workforce-ready graduates, and information on non-traditional employment sectors are also encouraged. ORAL

T41 Innovative Approaches to Teaching Sedimentary Geology Courses

GSA Geoscience Education Division; GSA Sedimentary Geology Division; National Association of Geoscience Teachers

Geoscience Education; Sediments, Clastic; Sediments, Carbonates

Karen Grove, San Francisco State University, San Francisco, CA; Marjorie A. Chan, University of Utah, Salt Lake City, UT; R. Heather Macdonald, College of William and Mary, Williamsburg, VA

This session will focus on instructional techniques that integrate research advances, innovative pedagogies, and applications to other geoscience fields. Authors may address overall course structure, learning objectives, specific assignments, and/or assessment methods. ORAL and POSTER

T42 Enhancing the Earth Science Content Knowledge of Elementary School Teachers

National Association of Geoscience Teachers

Geoscience Education

Barbara M. Manner, Duquesne University, Pittsburgh, PA

Most elementary school teachers lack appropriate content knowledge to effectively teach earth science. During this session, professionals will share what they have been doing to enhance the earth science content knowledge of these teachers. ORAL

T43 Field and Research Experiences for Students at Two-Year Colleges

National Association of Geoscience Teachers

Geoscience Education

Laura Guertin, Penn State University, Delaware County, Media, PA; Prajukti Bhattacharyya, Saint Louis Community College, Meramec, Saint Louis, MO

Faculty at two-year colleges will discuss ideas and issues in providing a two-year student population with field and research experiences. Submission of abstracts may include, but are not limited to, effective field instruction, logistics of arranging trips with a commuter population, and doing research with a limited pool of geoscience students. ORAL

T44 Sigma Gamma Epsilon Student Research (Posters)

Sigma Gamma Epsilon

Environmental Geoscience

Donald W. Neal, East Carolina University, Greenville, NC; Charles J. Mankin, Oklahoma Geological Survey, Norman, OK

All students are welcome to submit posters on their research on any aspect of geology. POSTER

T45 Geological and Geophysical Databases: What We Have and What We Need

GSA Geophysics Division, GSA Structure and Tectonics Division

Geoscience Information/Communication; Geophysics/Tectonophysics/Seismology; Remote Sensing/Geographic Info System

G. Randy Keller, University of Texas, El Paso, TX; J. Douglas Walker, University of Kansas, Lawrence, KS

The recognition of the complexity of the questions that our community faces has dictated that we create a data system to facilitate sharing and integration of diverse data. This session focuses on the first step in this process, which is understanding the status of existing databases and identifying data that have yet to be crafted into databases. ORAL

T46 Challenges in Geoscience Publishing: The Insiders' Perspectives

Association of Earth Science Editors (AESE)

Geoscience Information/Communication; Geoscience Education; Public Policy

Monica G. Easton, Ontario Geological Survey, Sudbury, ON; Carol L. Ruthven, Kentucky Geological Survey, Lexington, KY

Presenters will discuss issues that authors, reviewers, and editors confront in publishing geoscientific manuscripts (e.g., intellectual property rights, copyright retention, confidentiality, conflicts of interest, plagiarism, fraud, "salami" publishing, electronic publication, manuscript review quality, reviewer overload, etc.) and offer solutions. ORAL

T47 Design and Development of XML-based, Discipline-Specific, Geological Markup Languages, and Development of Applications (with Object-oriented Languages) and Databases to Process, Store, and Interchange Geological Data over the Web

Geoscience Information/Communication; Remote Sensing/Geographic Info System; Structural Geology

Hassan A. Babaie, Georgia State University, Atlanta, GA; Rahul Ramachandran, University of Alabama, Huntsville, AL

The session will cover techniques of developing markup languages applying the XML specifications in different fields of geosciences, e.g., TectonicsML, SedML, StratML, SeismML, GeochemML, and for the whole geology (GeoML). ORAL and POSTER

T48 Geoscience Information Horizons: Challenges, Choices, and Decisions

Geoscience Information Society

Geoscience Information/Communication

Lura E. Joseph, University of Illinois at Urbana-Champaign, IL; Joanne Lerud-Heck, Colorado School of Mines, Golden, CO

Geoscience information professionals are confronted with challenges and opportunities in all areas, including collections and use of collections. New technologies present a variety of choices, and the decisions made will affect geology collections and information users now and far into the future. ORAL and POSTER

T49 The National Geologic Map Database (Posters)

U.S. Geological Survey; Association of American State Geologists

Geoscience Information/Communication

David R. Soller, U.S. Geological Survey, Reston, VA; Thomas M. Berg, Ohio Geological Survey, Columbus, OH

The National Geologic Map Database (http:// ncgmp.usgs.gov/ngmdbproject/) is a Congressionally mandated effort. This session will focus on collaborative USGS–state geological survey advances in digital mapping, standards (map symbolization, data model, science language), and map databases being conducted under the aegis of this project. POSTER

T50 Henry Darcy's 200th Birthday: Fundamental Advancements Through Observation and Analysis

GSA Hydrogeology Division; National Ground Water Association; GSA History of Geology Division; History of Earth Science Society (HESS)

Hydrogeology; Engineering Geology; History of Geology

Vicki J. Kretsinger Grabert, Luhdorff and Scalmanini, Consulting Engineers/ AGWSE (NGWA), Woodland, CA; Graham E. Fogg, University of California, Davis, CA

This session will honor Henry Darcy, his research approach, and his profound Law. Planned presentations include a historical perspective of his accomplishments and recent, observation-based research that will fundamentally change our understanding of groundwater flow and mass transport phenomena and help identify future research needs. ORAL

T51 M. King Hubbert at 100: The Enduring Contributions of Twentieth-Century Geology's Renaissance Man

GSA Hydrogeology Division, National Ground Water Association; U.S. National Chapter of the International Association of Hydrogeologists; GSA Geophysics Division; GSA Sedimentary Geology Division; GSA Structural Geology and Tectonics Division; GSA History of Geology Division

Hydrogeology; Structural Geology; History of Geology

Alan E. Fryar, University of Kentucky, Lexington, KY; T.N. Narasimhan

M. King Hubbert (1903–1989) made fundamental contributions to structural geology, tectonics, hydrogeology, and petroleum geology. He forecast the decline in worldwide petroleum reserves and advanced the development of geology as a quantitative discipline. This session explores Hubbert's legacy as scientist, educator, citizen, and visionary. ORAL

T52 Twenty Years of Exploration and Innovation in Quantitative Hydrogeology: In Honor of Ed Sudicky

GSA Hydrogeology Division

Hydrogeology

Rene Therrien, Universite Laval, Quebec, QC; Motomu Ibaraki, Ohio State University, Columbus, OH

Since obtaining a Ph.D. in hydrogeology in 1983, Ed Sudicky has conducted innovative research on topics such as multiphase flow, stochastic analysis in heterogeneous and fractured media, coupled surface/groundwater flow and contaminant migration in hydrologic systems. We are soliciting talks on the state of the science of these and related topics. ORAL

T53 Watershed-Based Research and Education: The State of the Science

GSA Hydrogeology Division; GSA Geoscience Education Division; GSA Quaternary Geology and Geomorphology Division; Geochemical Society

Hydrogeology; Environmental Geoscience; Quaternary Geology/Geomorphology

Rachel O'Brien, Allegheny College, Meadville, PA; Christopher J. Woltemade, Shippensburg University of Pennsylvania, Shippensburg, PA

We seek a diverse group of scientists and watersheds studied for the session. Topics for consideration include innovations in

field methods, data collection and management, watershed monitoring, and/or research findings. Abstracts related to undergraduate education are also encouraged. ORAL

T54 Geochemical Modeling of Arsenic Speciation, Transformation, and Reactive Transport in Groundwater

GSA Hydrogeology Division

Hydrogeology; Geochemistry, Aqueous; Geomicrobiology

Chen Zhu, University of Pittsburgh, Pittsburgh, PA; Robert Ford, U.S. Environmental Protection Agency, Ada, OK

Contributions are sought for all aspects of arsenic geochemical modeling in groundwater, including thermodynamic database revisions, modeling sorption to aquifer solids, modeling redox reaction dynamics, and field applications of geochemical models. ORAL

T55 Groundwater and Watershed Analysis Across Political Boundaries

GSA Hydrogeology Division

Hydrogeology; Public Policy; Environmental Geoscience

Barry J. Hibbs, California State University, Los Angeles, CA; Dave Rudolph

Many aquifers and surface watersheds underlie and cross geopolitical boundaries. This session examines specific issues of transboundary water resources, including successful strategies and impediments in technical case studies, security, management, and modeling. ORAL

T56 Recent Advances in Outcrop-Aquifer Analog Studies: Insights from Geophysical, Geostatistical, and Modeling Techniques

GSA Hydrogeology Division

Hydrogeology; Stratigraphy; Environmental Geoscience

Andrew C. Muller, Millersville University, Millersville, PA

Insights from geophysical, geostatistical, and modeling efforts will be presented as they apply to outcrop-analog studies in heterogeneous porous media from various depositional environments. ORAL and POSTER

T57 The Role of Diffusion in Groundwater Contaminant Behavior

GSA Hydrogeology Division

Hydrogeology; Environmental Geoscience

Matthew W. Becker, University at Buffalo, Buffalo, NY; Beth Parker, University of Waterloo, Waterloo, ON

The role of molecular diffusion in contaminant behavior may be different in consolidated and unconsolidated dual-porosity media, but the transport mechanisms are similar. We encourage interaction of researchers working in heterogeneous sediments and fractured rocks and clay. We especially solicit

contributions involving field or laboratory data. ORAL and POSTER

T58 Saturated and Vadose Zone Hydrogeology, Environmental Geology, and Biogeochemistry of the Department of Energy Hanford Site in Southeastern Washington State

GSA Hydrogeology Division

Hydrogeology; Environmental Geoscience; Engineering Geology

Timothy D. Scheibe, Pacific Northwest National Lab, Richland, WA; Christopher J. Murray, Battelle Pacific Northwest National Lab, Richland, WA; Andy L. Ward, Pacific Northwest National Lab, Richland, WA

This session will explore Hanford Site geology as the setting for complex hydrologic, geochemical, and microbiological processes that influence the fate, transport, and remediation of radiological and hazardous wastes in the vadose zone and groundwater. ORAL and POSTER

T59 Pharmaceuticals and Emerging Organic Contaminants in the Hydrologic Environment: Progressing from Occurrence to Fate and Effects

GSA Hydrogeology Division; Toxic Substances Hydrology Program, Water Resources Discipline, U.S. Geological Survey

Hydrogeology; Environmental Geoscience; Limnogeology

Edward T. Furlong, U.S. Geological Survey, Denver, CO; Dana W. Kolpin, U.S. Geological Survey, Iowa City, IA

The study of pharmaceuticals and other organic wastewater contaminants is advancing beyond simple descriptive studies and detailed investigations of the transport, fate, and effects of these compounds are underway by many research groups. The presentations in this session provide a state-of-the-science overview for this exciting research area. ORAL

T60 Transport and Remediation of Organic Compounds in the Saturated Zone

GSA Hydrogeology Division

Hydrogeology; Geochemistry, Organic; Environmental Geoscience

Thomas B. Boving, University of Rhode Island, Kingston, RI; John E. McCray, Colorado School of Mines, Golden, CO

Transport, fate, and remediation of organic contaminants in groundwater systems has been the focus of intense research over the past decade. This session will focus on recent advances and elucidates the fundamental physics and chemistry associated with these processes. ORAL and POSTER

T61 Springs: Interactions of Physical, Chemical, Biological, and Cultural Systems

GSA Hydrogeology Division

Hydrogeology; Environmental Geoscience; Engineering Geology

Abe Springer, Northern Arizona University, Flagstaff, AZ; Susan Swanson, Beloit College, Beloit, WI

Springs support immense biological diversity and are important for traditional uses by various cultures. We encourage submissions of recent research into the physical and chemical understanding of springs and the interactions between springs and their dependent biological and cultural systems. ORAL and POSTER

T62 Flow and Biogeochemical Processes at the Interface Between Surface Water and Groundwater

GSA Hydrogeology Division

Hydrogeology; Geochemistry, Aqueous; Marine/Coastal Science

Donald O. Rosenberry, U.S. Geological Survey, Lakewood, CO; Masaki Hayashi, University of Calgary, Calgary, AB

Research on the interaction between surface water and groundwater will be presented from a broad range of physical settings and scientific disciplines. Topics will include hydrological and biogeochemical processes, measurement methods, and results from mathematical modeling. ORAL

T63 Exploring the Linkages Between the Geochemistry, Biology, and Hydrology of the Hyporheic Zone (Posters)

GSA Hydrogeology Division

Hydrogeology; Geochemistry, Aqueous; Quaternary Geology/Geomorphology

Eric W. Peterson, Illinois State University, Normal, IL; Toby Dogwiler, Winona State University, Winona, MN

An interdisciplinary session designed to synthesize and expose concepts of hyporheic zone, focusing on the "exchange flows" that link the geochemistry, biology, and hydrology of the stream with the substrate forms of the hyporheic zone. POSTER

T64 How Subsurface Properties Determine Microbial Habitats: The Role of Groundwater Flow and Subsurface Chemistry in Supplying Energy and Nutrients to the Subsurface Biosphere

GSA Hydrogeology Division, International Association of Hydrogeologists/U.S. National Chapter; GSA Geobiology and Geomicrobiology Division

Hydrogeology; Geomicrobiology; Geochemistry, Aqueous

Barbara Bekins, U.S. Geological Survey, Menlo Park, CA; Phillip Bennett, University of Texas, Austin, TX

This session will examine the role of groundwater flow and subsurface chemistry in supplying energy and nutrients to the subsurface biosphere. Microbial habitats both in the terrestrial subsurface and below the seafloor and their relationship to subsurface properties are of interest. ORAL and POSTER

T65 Evolution and Migration of Brines in Sedimentary Basins

GSA Hydrogeology Division, Society of Economic Geologists

Hydrogeology; Geochemistry, Aqueous; Economic Geology

Alicia M. Wilson, University of South Carolina, Columbia, SC; Benjamin J. Rostron, University of Alberta, Edmonton, AB

Brines hold clues to often complex paleohydrologic and geochemical histories and provide an important approach for studies of long-term transport in sedimentary basins. We seek contributions that explore the geochemical evolution, migration, and distribution of brines in modern and ancient basins from hydrogeologic and geochemical standpoints. ORAL and POSTER

T66 Karst Hydrology and Geomorphology in North America Over the Past Half Century: In Honor of Derek Ford and William White

GSA Hydrogeology Division; GSA Quaternary Geology and Geomorphology Division; Karst Waters Institute

Hydrogeology; Quaternary Geology/Geomorphology

Carol M. Wicks, University of Missouri, Columbia, MO; Russell S. Harmon, U.S. Army Research Office, Durham, NC

For 50 years, sustained pioneering work by Derek Ford and Will White has guided North American research in karst hydrology and geomorphology. This session honors their scientific contributions by presenting current research results and new research directions. ORAL and POSTER

T67 Hydrogeologic Analysis of Glaciated Terrains

GSA Hydrogeology Division; GSA Engineering Geology Division

Hydrogeology; Quaternary Geology/Geomorphology; Engineering Geology

John J. Quinn, Argonne National Lab, Argonne, IL; M. Jim Hendry, University of Saskatchewan, Saskatoon, SK

Characterizing complex glacial deposits poses a challenge in analyses of groundwater contamination and water resources. Field, lab, and computer techniques to characterize and model the hydrogeology of glaciated terrains are presented. ORAL

T68 Quaternary Stratigraphy and Implications for Water Resources in the Pacific Northwest

U.S. Geological Survey; Washington Water Science Center; GSA Hydrogeology Division

Hydrogeology; Quaternary Geology/Geomorphology; Environmental Geoscience

Sue Culton Kahle, U.S. Geological Survey, Tacoma, WA; Christopher P. Konrad, U.S. Geological Survey, Tacoma, WA

Advances in Quaternary stratigraphic knowledge and applied hydrogeology will be shared by participants in order to further the advancement of hydrogeologic sciences related to the Quaternary deposits in the Pacific Northwest. ORAL and POSTER

T69 Characterization of Brackish and Saline Aquifer Systems

GSA Hydrogeology Division; U.S. Geological Survey

Geochemistry, Aqueous; Hydrogeology

Norman Grannemann, U.S. Geological Survey, Lansing, MI; Alan Burns, U.S. Geological Survey, Lakewood, CO

This session addresses the hydrogeology of saline and brackish aquifers, the geochemistry of water in those systems, the effects of withdrawing saline water for desalting, and disposal of brine associated with the desalting process. ORAL

T70 Heterogeneity in Sedimentary Aquifers: Challenges for Characterization and Flow Modeling

GSA Hydrogeology Division

Hydrogeology; Sediments, Carbonates; Sediments, Clastic

Timothy T. Eaton, Wisconsin Geological and Natural History Survey, Madison, WI; Kenneth R. Bradbury, Wisconsin Geological and Natural History Survey, Madison, WI

Many groundwater settings do not have the homogeneous, isotropic conditions often assumed in sedimentary aquifers. This session will bring together hydrogeologic characterization and flow modeling work in complex environments such as heterogeneous unlithified material, carbonate and clastic bedrock, karst, and fractured or faulted settings. ORAL

T71 Hydrogeology of Volcanic Arcs

GSA Hydrogeology Division

Hydrogeology; Volcanology

Michael Manga, University of California, Berkeley, CA; Timothy Rose, Lawrence Livermore National Lab, Livermore, CA

Many of the unusual hydrologic systems and processes in volcanic arcs result indirectly from active magmatism. Magmatic activity affects both hydrogeologic properties and the range of temperatures at which water-rock interactions occur. We welcome submissions dealing with the full spectrum of temperature, depth, and time scales. ORAL and POSTER

T72 A Century of Hydrogeologic Investigations and Groundwater Modeling in the Great Basin: What Have We Learned?

GSA Hydrogeology Division; U.S. Geological Survey

Hydrogeology; Structural Geology; Tectonics

Wayne R. Belcher, U.S. Geological Survey, Henderson, NV; Donald S. Sweetkind, U.S. Geological Survey, Denver, CO

What have we learned about the hydrogeology of this region and how are these data used to model the groundwater system? We welcome presentations that provide historical perspective and recent advances on understanding the hydrogeologic system of this important region that includes the Nevada Test Site and Yucca Mountain. ORAL

T73 The Integration of Measurements and Modeling in the Hydrological Sciences

GSA Hydrogeology Division

Hydrogeology; Engineering Geology; Remote Sensing/Geographic Info System

Kellie B. Vache, Oregon State University, Corvallis, OR; Jeffrey J. McDonnell, Oregon State University, Corvallis, OR

This session will focus the utilization of measurements in modeling exercises, introduction of new model structures that better facilitate the use of measurements, or exploration of the role of numerical experiments and/or GIS in increasing the dialogue between experimentalist and modeler. ORAL and POSTER

T74 Revolutionizing Ocean Science: Cabled Observatories on the North American Pacific Coast

Marine/Coastal Science

John Delaney, University of Washington, Seattle, WA; Christopher Barnes, University of Victoria, Victoria, BC

The ocean sciences are entering a new era through the deployment of powered, fiber-optic cabled observatories that will provide real-time data and decadal time series. This session will consider the scientific, technological, and educational opportunities offered by three observatory projects under way on the Pacific margin of North America. ORAL

T75 Human Versus Natural Influences on Holocene Sedimentation in Estuaries, Harbors, and Marginal Marine Ecosystems

Society for Sedimentary Geology

Marine/Coastal Science; Quaternary Geology/Geomorphology; Paleoclimatology/Paleoceanography

Douglas W. Haywick, University of South Alabama, Mobile, AL; Miriam L. Fearn, University of South Alabama, Mobile, AL

This session will focus on the sedimentology and ecology of Recent deposits within marginal marine environments. In particular, it will bring together researchers examining human-induced and natural influences on Holocene sediment fill within these important ecosystems. ORAL and POSTER

T76 Present Posture and Future Status of Pacific Atoll Research

GSA International Division

Sediments, Carbonates; Environmental Geoscience; Marine/Coastal Science

John D. Collen, Victoria University of Wellington, Wellington, New Zealand; Douglas Edsall, U.S. Naval Academy, Annapolis, MD

This session will examine the current state of knowledge of sedimentary and biological systems of Pacific atolls and discuss the additional information needed to support future management of atoll environments. Atolls in the Pacific, as elsewhere, are threatened by overpopulation, development, pollution, and global environmental change. ORAL and POSTER

T77 Coastal Processes and Hazards Along Active Margin and Low Latitude Coasts

GSA Engineering Geology Division

Marine/Coastal Science; Quaternary Geology/Geomorphology; Environmental Geoscience

Cheryl J. Hapke, U.S. Geological Survey, Santa Cruz, CA; Laura J. Moore, Oberlin College, Oberlin, OH

This session will focus on the latest developments in our understanding of active margin and low latitude coastal processes and hazards, as well as effective mitigation strategies. ORAL and POSTER

T78 Gas Hydrate in the Natural Environment and Implications for Energy Resources, Seafloor Stability, Climate, and the Biology of the Deep Sea (Posters)

Marine/Coastal Science; Environmental Geoscience; Engineering Geology

William P. Dillon, U.S. Geological Survey, Woods Hole, MA; Timothy S. Collett, U.S. Geological Survey, Denver, CO; Deborah R. Hutchinson, U.S. Geological Survey, Woods Hole, MA

This session will emphasize recent concepts and field results regarding mechanisms of concentration of gas hydrate, control of landslides, contribution of methane to the atmosphere, implications for vent biota, and general characterization of natural gas hydrate. POSTER

T79 Biogeochemical Processes at Ancient and Modern Methane Seeps

Burke Museum of Natural History and Culture

Marine/Coastal Science; Paleoclimatology/Paleoceanography; Paleontology/Paleobotany

Joern Peckmann, Research Center for Ocean Margins, University of Bremen, Bremen, Germany; James L. Goedert

Numerous hydrocarbon-seep deposits have been reported from Recent and Cenozoic strata, and relatively few Mesozoic and Paleozoic deposits have been recognized. Distinctive carbonate fabrics, stable isotope signatures, and biomarker patterns are diagnostic for biogeochemical processes at ancient seep sites. ORAL

T80 The Impact of Crystal Chemistry in the Earth Sciences: A Tribute to Charles T. Prewitt, Recipient of the 2003 Roebling Medal of the Mineralogical Society of America

Mineralogical Society of America

Mineralogy/Crystallography

Nancy L. Ross, Virginia Tech, Blacksburg, VA; Russell J. Hemley, Carnegie Institution of Washington, Washington, D.C.; Ross J. Angel, Virginia Tech, Blacksburg, VA

A session to celebrate the fundamental contributions of Charles T. Prewitt, the 2003 Roebling Medallist of the Mineralogical Society of America, to the fields of crystallography, crystal chemistry, mineralogy, and mineral physics. ORAL and POSTER

T81 Multi-Proxy Terrestrial Records and the Ocean-Climate System: Links and Perturbations in the Cretaceous

Paleoclimatology/Paleoceanography; Geochemistry, Other; Paleontology/Paleobotany

David B. Finkelstein, Indiana University, Bloomington, IN; Darren R. Gröcke, Royal Holloway University of London, Egham, Surrey, UK; Lisa M. Pratt, Indiana University, Bloomington, IN

Topics concerning the geochemical signature of botanical, pedogenic, and lacustrine materials, terrestrial-marine correlations, terrestrial biotic response to atmospheric and oceanic change, and the record of pCO_2 and climate in the Cretaceous are encouraged. ORAL and POSTER

T82 Ocean Chemistry Through the Mesozoic and Cenozoic

Geochemical Society

Paleoclimatology/Paleoceanography; Geochemistry, Other

Adina Paytan, Stanford University, Stanford, CA

There is considerable evidence that the chemical composition of the ocean has changed over the past 550 m.y. These changes relate to changes in the global biogeochemical cycles. New research in this field will be presented. ORAL and POSTER

T83 Reevaluating the Equatorial Temperature Paradox for Mesozoic and Cenozoic Warm Episodes

Paleoclimatology/Paleoceanography; Geochemistry, Other; Stratigraphy

Timothy S. White, U.S.Geological Survey, Anchorage, AK; David Pollard, Pennsylvania State University, University Park, PA; Chris Poulsen, University of Southern California Earth Sciences, Los Angeles, CA

During past warm episodes, many proxy data indicate greater warming at high latitudes than at low latitudes. This thermal gradient cannot be sustained in climate models by increased CO_2 alone. We will address the paradox using a combined data-modeling approach. ORAL and POSTER

T84 Pliocene Climates—Sea Levels and Ice Volumes (Posters)

Paleoclimatology/Paleoceanography

Detlef A. Warnke, California State University, Hayward, CA; Lloyd Burckle, Lamont-Doherty Earth Observatory, Palisades, NY

Abstracts are encouraged on all aspects of Pliocene climate research, including field work on all continents and marine research in all oceans. Participation by students is encouraged. POSTER

T85 Signs of Life: the Role of Paleobiology in the History of Evolutionary Theory and our Attempts to Understand the Changing Nature of the Biosphere

GSA History of Geology Division; Paleontological Society; Society of Vertebrate Paleontology; Cushman Foundation; History of Earth Science Society (HESS)

History of Geology; Paleontology/Paleobotany; Geomicrobiology

Roger D.K. Thomas, Franklin & Marshall College, Lancaster, PA; Gary D. Rosenberg, Indiana University–Purdue University, Indianapolis, IN

Fossils are static, inanimate objects. This session will explore the ways in which they have been brought to life. Studies of earlier work, not originally characterized as paleobiology, will set the stage for a critical assessment of 20th century paleobiology. ORAL

T86 Fossil Decapod Crustacean Paleobiogeography, Systematics, and Evolution Over the Past 20 Years: In Honor of Ross and Marion Berglund (Posters)

Paleontological Society, Paleontology Society

Paleontology/Paleobotany

Elizabeth Nesbitt, Burke Museum, Seattle, WA; Torrey G. Nyborg, Loma Linda University, Loma Linda, CA

Fossil decapod crustaceans collected and donated by Ross and Marion Berglund have yielded a number of new taxa from the Pacific Northwest of North America, immensely adding to our knowledge of fossil decapod crustacean paleobiogeography, systematics, and evolution. POSTER

T87 Paleo-Plant Ecophysiology

Paleontological Society

Paleontology/Paleobotany; Paleoclimatology/Paleoceanography; Environmental Geoscience

Dana L. Royer, Pennsylvania State University, University Park, PA; Christopher J. Williams, University of Pennsylvania, Philadelphia, PA

Recent advances in paleo-plant ecophysiology have sharpened our understanding of ancient terrestrial ecosystems and climates. This session will focus on studies that provide mechanistic linkages between plant physiology, ecology, and climate. ORAL

T88 The Hunt for Precambrian Life: An Integrated Approach

Paleontological Society, GSA Geobiology and Geomicrobiology Division; Precambrian (at large)

Paleontology/Paleobotany; Geomicrobiology; Precambrian Geology

David J. Bottjer, University of Southern California, Los Angeles, CA; J. William Schopf, University of California, Los Angeles, CA

Detection of Precambrian life is a strong focus of attention for earth and biological scientists. This session centers on the latest advances in methods used for, and results of, searches for evidence of such ancient life, as shown by studies of fossils, sedimentary structures of biologic origin, and isotopic and organic geochemical data. ORAL and POSTER

T89 Evolutionary and Ecological Links Between Terrestrial and Marine Ecosystems in the Phanerozoic

Paleontological Society

Paleontology/Paleobotany; Paleoclimatology/Paleoceanography; Geochemistry, Other

Wolfgang Kiessling, Humboldt University, Berlin, Germany; Allister Rees, University of Chicago, Chicago, IL

This session will focus on large-scale ecological and evolutionary patterns in Phanerozoic terrestrial and marine environments. The ecological links between terrestrial and marine ecosystems are explored using paleontological, sedimentological, geochemical, and modeling approaches. ORAL

T90 Terrestrial Paleobiology of South America, Cretaceous through Neogene

Paleontological Society

Paleontology/Paleobotany; Paleoclimatology/Paleoceanography; Sediments, Clastic

Peter Wilf, Pennsylvania State University, University Park, PA; Robyn J. Burnham, University of Michigan, Ann Arbor, MI; Maria A. Gandolfo, Cornell University, Ithaca, NY; Kirk R. Johnson, Denver Museum of Nature & Science, Denver, CO

Topics may include the evolution of South American biological diversity and ecosystems, biogeographic relationships, differences between Cretaceous and Paleogene biotas, biostratigraphy, and response to climate change, uplift, invasion, and other disturbances. ORAL and POSTER

T91 Understanding Late Devonian Biotic, Climatic, and Oceanographic Events: Toward an Integrated Approach

Paleontological Society

Paleontology/Paleobotany; Geochemistry, Other; Paleoclimatology/Paleoceanography

Jared R. Morrow, University of Northern Colorado, Greeley, CO; Paul B. Wignall, University of Leeds, Leeds, UK; D. Jeffrey Over, State University of New York, Geneseo, NY

This multidisciplinary session will examine the dynamic Late Devonian interval, which was marked by dramatic fluctuations in sea level, ocean oxygenation, stable isotopic ratios, and global biodiversity, accompanied by accelerated terrestrialization and multiple bolide impacts. ORAL

T92 Advances in the Fossil Record of Insects and Other Terrestrial Arthropods

GSA Geobiology and Geomicrobiology Division; Paleontological Society; Paleontological Research Institute

Paleontology/Paleobotany; Coal Geology; Paleoclimatology/Paleoceanography

Cary Easterday, Ohio State University, Columbus, OH; Conrad Labandeira, Smithsonian Institute, Washington, D.C.

A session to bring together those working on, and those interested in, the body and trace fossil record of the dominant animal phylum on dry land. ORAL and POSTER

T93 Micropaleontological Proxies of Ocean Gateway Paleoceanography

Cushman Foundation

Paleontology/Paleobotany; Paleoclimatology/Paleoceanography; Geochemistry, Other

Stephen A. Nathan, University of Massachusetts, Amherst, MA; R. Mark Leckie, University of Massachusetts, Amherst, MA

Ocean gateways such as the Drake Passage, Central American Seaway, and the Indonesian Seaway have altered ocean circulation, directly affecting ocean heat transport, and in turn, climate. This session will provide the opportunity to exchange and discuss new results and ideas about ocean gateway paleoceanography based on micropaleontological proxies. ORAL and POSTER

T94 Bridging the Gap: Ostracodes in the Earth Sciences

Paleontological Society; GSA Limnogeology Division

Paleontology/Paleobotany; Quaternary Geology/Geomorphology; Hydrogeology

Gene Hunt, University of Chicago, Chicago, IL; Lisa E. Park, University of Akron, Akron, OH

This session emphasizes new, interdisciplinary advances in ostracode research. Talks will span paleontology, molecular biology, hydrogeology, paleoclimatology, and paleolimnology. Speakers will emphasize applied approaches using this important group, to solve different problems in a broad diversity of disciplines within the earth sciences. ORAL

T95 Organic Carbon in Lake Systems: From Primary Production to Oil Production

GSA Limnogeology Division

Limnogeology; Geochemistry, Organic; Quaternary Geology/Geomorphology

Kevin Bohacs, ExxonMobil Upstream Research Co., Houston, TX; Thomas C. Johnson, University of Minnesota, Duluth, MN

Lacustrine basins account for about 20% of today's supply of oil and natural gas, yet little dialogue occurs between limnologists who study processes that control carbon production in modern large lakes and geologists who exploit ancient lacustrine systems for oil and gas. This session aims to bring these two groups of scientists together. ORAL

T96 Lakes and Holocene Environmental Change: The Use of Multiproxy Lake Records for Paleoclimate Reconstructions

GSA Limnogeology Division

Limnogeology; Paleoclimatology/Paleoceanography; Quaternary Geology/Geomorphology

Mark Abbott, University of Pittsburgh, Pittsburgh, PA; Andrea Lini, University of Vermont, Burlington, VT

This session is aimed at demonstrating the strength of multiproxy approaches to Holocene climate reconstruction from lake sediment records. ORAL and POSTER

T97 Who Needs Carbon: Innovative Applications of Alternative Quaternary Geochronology Methods (Posters)

Quaternary Geology/Geomorphology; Archaeological Geology

Kenneth Lepper, Los Alamos National Lab, Los Alamos, NM; Andrew Ivester, State University of West Georgia, Carrollton, GA

A spectrum of absolute dating techniques and relative geochronologic methods are now available to Quaternary scientists. This session aims to highlight the diversity and versatility of chronologic tools, other than radiocarbon, by emphasizing recent technique advances and innovative applications studies. POSTER

T98 Interhemispheric Records of Paleoclimate Change: Low Latitude Influences on the High Latitudes, or the Other Way Around, in Pole-Equator-Pole Syntheses

GSA Quaternary Geology and Geomorphology Division; International Geosphere/Biosphere Program—Past Global Changes

Quaternary Geology/Geomorphology; Paleoclimatology/Paleoceanography; Limnogeology

Vera Markgraf, University of Colorado, Boulder, CO; Julie Brigham-Grette, University of Massachusetts, Amherst, MA

Emerging evidence and modeling now suggest the tropics may drive the climate system on a variety of time scales. This session encourages evolving ideas aimed at pole-equator-pole comparisons of Quaternary oceanographic and terrestrial proxy records. ORAL and POSTER

T99 Soils and a Sustainable Future—The Neglected Challenge in Geology: A Tribute to the Many Contributions and Challenges of Aldo Leopold

GSA Geology and Public Policy Committee; U.S. National Committee for the Geological Sciences; Geological Association of Canada; Canadian Society of Soil Science

Public Policy; Environmental Geoscience; Quaternary Geology/Geomorphology

Paul H. Reitan, University at Buffalo, Buffalo, NY; Ward Chesworth

This session will examine soil function in the ecosphere and its role in maintaining human societies: ecological overview; human activity and soil function—from first agriculture to present modern industrialized agriculture; paleosols and climate change; a vision of farming in N. America; and application of science in the sociopolitical arena. ORAL

T100 Wetland Science: Intersection of Hydrogeology, Geomorphology, Ecology, and Computer Modeling

GSA Hydrogeology Division; USDI—Geological Survey; Montana State University

Hydrogeology; Quaternary Geology/Geomorphology; Environmental Geoscience

Richard S. Sojda, USDI—Geological Survey, Bozeman, MT; Brian L. McGlynn, Montana State University, Bozeman, MT; Donald O. Rosenberry, U.S. Geological Survey, Lakewood, CO

We will explore the intersection of geologic disciplines that contributes to an understanding of wetland ecology. Papers should focus on integrative methodologies and might explore wetland geomorphology, soils, landscape hydrology, hydroperiods, plant and wildlife communities, and computer modeling. ORAL

T101 Erosion, Exhumation, and Uplift: Complex Interactions and Feedback Mechanisms Between Tectonics and Geomorphology

GSA Quaternary Geology and Geomorphology Division; GSA Structural Geology and Tectonics Division

Quaternary Geology/Geomorphology; Tectonics; Remote Sensing/Geographic Info System

Kurt L. Frankel, Lehigh University, Bethlehem, PA; Bernard Guest, University of California, Los Angeles, CA

This session will investigate complex links and feedback mechanisms associated with fluvial and glacial erosion and orogenic processes from a multidisciplinary approach. The necessary thresholds needed for these interactions will be a primary focus. ORAL and POSTER

T102 Geological Mapping: Key to Successful Management of Water and Land Resources (Posters)

GSA Quaternary Geology and Geomorphology Division; GSA Hydrogeology Division; GSA Engineering Geology Division; U.S. Geological Survey; Association of American State Geologists

Quaternary Geology/Geomorphology; Hydrogeology; Environmental Geoscience

Richard C. Berg, Illinois State Geological Survey, Champaign, IL; Peter T. Lyttle, U.S. Geological Survey, Reston, VA; Harvey Thorleifson, Geological Survey of Canada, Ottawa

Geological mapping is a key to environmental protection and management of water and land resources. This session will highlight innovative mapping products that are being used by an increasingly broad range of users. POSTER

T103 Comprehensive Landscape Analysis—A Predictive Tool for Mapping Surficial Deposits and Their Environmental Attributes

GSA Sedimentary Geology Division

Quaternary Geology/Geomorphology; Stratigraphy; Environmental Geoscience

Kathleen M. Farrell, Raleigh, NC; C. William Zanner, University of Nebraska, Lincoln, NE

This session will cover research that integrates predictive, geomorphic maps derived from electronic spatial data (GIS); subsurface investigations intended to map surficial sedimentary facies; and environmental attributes such as geologic processes, hazards, hydrologic characteristics, or geochemical signatures. ORAL and POSTER

T104 "Noah's Flood" and the Late Quaternary Geological and Archaeological History of the Black Sea and Adjacent Basins

Avalon Institute of Applied Science

Quaternary Geology/Geomorphology; Paleoclimatology/Paleoceanography; Archaeological Geology

Valentina Yanko-Hombach, Avalon Institute of Applied Science, Winnipeg, MB; Jim Teller, University of Manitoba, Winnipeg, MB

New data on the Late Quaternary geology and archaeology of the Black Sea and adjacent basins will be presented, and the hypothesized link of Noah's Flood to the Black Sea basin will be discussed. ORAL

T105 Ecological Implications of Headwater Channel Processes

Environmental Geoscience; Quaternary Geology/Geomorphology

Michael K. Liquori, University of Washington, Seattle, WA

In this session, we will explore the relationship between hydrology, geomorphology, and ecology, particularly as it may guide land-use management. Authors seeking to express conceptual ideas, theoretical musings, and/or detailed analyses of data are encouraged to submit abstracts to this highly interdisciplinary discussion. ORAL and POSTER

T106 Quaternary History and Stratigraphy of the Pacific Northwest

Quaternary Geology/Geomorphology

Kathy Goetz Troost, University of Washington, Seattle, WA; Tim Walsh, Washington Division of Geology, Olympia, WA; Ralph Haugerud, University of Washington, Seattle, WA

This session seeks to present the latest findings of research on the Quaternary history and stratigraphy of the Pacific Northwest, including chronology, palynology, magnetostratigraphy, Quaternary deformation, landscape development, glacial processes and deposition, provenance studies, and geologic mapping. ORAL and POSTER

T107 Records of Quaternary Landscape Change in the Rocky Mountains

GSA Quaternary Geology and Geomorphology Division

Quaternary Geology/Geomorphology

Benjamin J.C. Laabs, University of Wisconsin, Madison, WI; Jeffrey S. Munroe, Middlebury College, Middlebury, VT

Increasingly focused field investigations and expanding application of newly developed methodologies continue to refine details of Quaternary landscape change in the Rocky Mountains. This session will provide a forum for presenting results of recent studies of the interactions of geomorphic processes and landscape evolution in this region. ORAL

T108 Sedimentary Records of Rapid Ice Sheet Decay and Intensive Ice-Calving Events

Quaternary Geology/Geomorphology; Sediments, Clastic; Stratigraphy

Amir Mokhtari Fard, American University of Beirut, Beirut, Lebanon

This session will focus on the investigation in the sedimentary records of Pleistocene as well as present ice sheets, ice caps, and large Himalayan glaciers to reveal the deglaciation mechanisms under rapid ice sheet retreat and intensive ice-calving events. ORAL

T109 New Insights into the Origins of Glacial Landscapes

Quaternary Geology/Geomorphology

Staci L. Goetz-Ensminger, Northwest Missouri State University, Maryville, MO; Nelson R. Ham, St. Norbert College, De Pere, WI; Jeffrey C. Strasser, Augustana College, Rock Island, IL

This session will focus on interrelated glaciological and geological processes of modern and ancient glaciers and ice sheets in an effort to develop a better understanding of the origins of glacial landscapes. ORAL and POSTER

T110 Assessing the Deglacial Record of Quaternary Ice Sheets

GSA Quaternary Geology and Geomorphology Division

Quaternary Geology/Geomorphology; Paleoclimatology/Paleoceanography

Tracy A. Brennand, Simon Fraser University, Burnaby, BC; Jerome-Etienne Lesemann, Simon Fraser University, Burnaby, BC

This session explores different styles, spatial patterns, and chronologies of deglaciation as inferred from the geomorphic and sedimentary record of past ice sheets. ORAL

T111 McMurdo Dry Valleys, Antarctica, 1903–2003: A Celebration of a Century of Science

GSA Limnogeology Division

Quaternary Geology/Geomorphology; Paleoclimatology/Paleoceanography; Geomicrobiology

W. Berry Lyons, Ohio State University, Columbus, OH; Andrew G. Fountain, Portand State University, Portland, OR

The first humans entered the McMurdo Dry Valleys, Antarctica region, in December 1903. Since this time, the dry valleys have yielded important geological and paleoclimatic data as well as provided a terrestrial analog to Mars. ORAL

T112 Tills We Meet Again: Terrestrial Records of Pre-Wisconsinan Glaciations, their Relationship to Other Pleistocene Climate Records, and Their Paleoclimatic Significance

Quaternary Geology/Geomorphology; Paleoclimatology/Paleoceanography; Stratigraphy

Greg Balco, University of Washington, Seattle, WA; Carrie Jennings Patterson, University of Minnesota, St. Paul, MN

Glaciers are the defining feature of the Quaternary Earth, yet most pre-Wisconsinan glacial deposits are not accurately dated. We seek papers that apply old or new dating or correlation techniques to early and middle Pleistocene terrestrial sediments, with the aim of illuminating the role of ice sheets in the Quaternary climate system. ORAL

T113 Glaciers, Glacial Geology, and Glacial Ecosystems in the National Parks

National Park Service

Environmental Geoscience; Quaternary Geology/Geomorphology; Geoscience Information/Communication

Harold S. Pranger, Denver, CO

Effective use of monitoring and research is needed to recognize and anticipate unique ecological aspects of park units containing glaciers. ORAL

T114 Isotopic Determination of Sediment Provenance: Techniques and Applications

GSA Sedimentary Geology Division

Sediments, Clastic; Geochemistry, Other; Tectonics

Paul Karl Link, Idaho State University, Pocatello, ID; Mark Fanning, Australian National University, Canberra, Australia; J. Brian Mahoney, University of Wisconsin, Eau Claire, WI

Isotopic and geochronologic techniques (detrital zircon U-Pb, Ar-Ar on K-feldspar and mica, Sm-Nd and Hf isotopes) to determine provenance and history of sedimentary basins. Session includes geologic applications to tectonic reconstruction. ORAL and POSTER

T115 New Applications of Provenance Analysis to Landscape Evolution and Sediment Transport Systems

GSA Sedimentary Geology Division

Sediments, Clastic; Stratigraphy; Tectonics

Matthias Bernet, University of Canterbury, Christchurch, New Zealand; Kari Bassett, University of Canterbury, Christchurch, New Zealand

This session will present new applications of sedimentary provenance analysis to exhumation studies, sediment recycling, and sediment transport systems. Emphasis will be on innovative applications of provenance analysis to landscape evolution and on new uses for established techniques, such as SEM-cathodoluminescence analysis of quartz. ORAL and POSTER

T116 Sabkha Environments, Recent Insights

GSA Hydrogeology Division

Hydrogeology; Sediments, Carbonates; Paleoclimatology/Paleoceanography

Warren W. Wood, Reston, VA; Abdulrahman S. Alsharhan, U.A.E. University, Al-Ain, United Arab Emirates; Peter T. Kolesar, Utah State University, Logan, UT

In 40 years since wide recognition of importance of sabkhas in the geologic record, new models of ecology, chemical evolution, solute, and water sources associated with sabkha development have been proposed. Their use in deciphering climate change has added to their interest. ORAL

T117 Influence of Tsunamis in the Geological Record

GSA Sedimentary Geology Division

Sediments, Clastic; Marine/Coastal Science; Neotectonics/Paleoseismology

Frank R. Ettensohn, University of Kentucky, Lexington, KY; Kevin G. Stewart, University of North Carolina, Chapel Hill, NC

Tsunamis are relatively common products of major geologic processes, yet their deposits have received remarkably little attention, especially in the pre-Quaternary record. Hence, the session is devoted to understanding diagnostic characteristics of tsunami deposits and using these to interpret the older sedimentary record. ORAL

T118 From the Abyss to the Beach: In Honor of Orrin H. Pilkey

Sediments, Clastic; Marine/Coastal Science; Geoscience Education

David M. Bush, State University of West Georgia, Carrollton, GA; Bruce F. Molnia, U.S. Geological Survey, Reston, VA

Orrin Pilkey has touched the lives of many. This session celebrates the remarkable impact of a career that spanned deep-sea, continental shelf, and coastal studies. We hope to do more than simply rehash 40 years of research and education, but to also celebrate the accomplishments of a generation of researchers and educators he helped produce. ORAL

T119 Revisiting the Biogeochemistry of Black Shales and Oxygen-Deficient Marine Environments

Geochemical Society

Geochemistry, Organic; Paleoclimatology/Paleoceanography; Sediments, Clastic

Richard B. Schultz, Elmhurst College, Elmhurst, IL; Timothy W. Lyons, University of Missouri, Columbia, MO

Origins of organic-rich facies will be explored in light of new research on bacterial redox pathways, trace metal biogeochemistry, nutrient cycling, organic geochemistry, isotope techniques, chemostratigraphy, ecological and petrographic relationships, depositional models, and improved modern analogs. ORAL and POSTER

T120 Sedimentology and Oceanography of Phosphogenic Systems

Sediments, Carbonates; Sediments, Clastic; Paleoclimatology/Paleoceanography

Peir K. Pufahl, Queen's University, Kingston, ON; Eric E. Hiatt, University of Wisconsin, Oshkosh, WI

This session will bring together a diverse group of researchers to explore controversies surrounding phosphorus accumulation and preservation of sedimentary apatite. A process-oriented approach will elucidate oceanographic and depositional controls over geologic time. ORAL and POSTER

T121 Fortieth Anniversary of Sloss's Cratonic Sequences: Sequence Stratigraphy of the Sauk Sequence

Stratigraphy; Sediments, Carbonates; Paleontology/Paleobotany

Kevin R. Evans, Southwest Missouri State University, Springfield, MO; James F. Miller, Southwest Missouri State University, Springfield, MO

Sloss's classic publication on North American stratigraphy introduced the concept of Sequences. We encourage papers on all aspects of sequence stratigraphy within the Sauk Sequence. This session follows a field trip to spectacular localities in western Utah. ORAL and POSTER

T122 Clinoforms: Past, Present, and Modeled

GSA Sedimentary Geology Division

Stratigraphy; Sediments, Clastic; Marine/Coastal Science

Charles A. Nittrouer, University of Washington, Seattle, WA; Lincoln F. Pratson, Duke University, Durham, NC; David Mohrig, Massachusetts Institute of Technology, Cambridge, MA

Clinoforms are a fundamental unit of stratigraphy that is observed in a range of sedimentary environments over scales of centimeters to tens of kilometers. This session will examine observational (modern and ancient), experimental, and modeling studies of their formation. ORAL and POSTER

T123 Advances in Stratigraphic Analyses Using Ground Penetrating Radar

GSA Geophysics Division; GSA Engineering Geology Division

Geophysics/Tectonophysics/Seismology; Quaternary Geology/Geomorphology; Hydrogeology

Gregory S. Baker, University at Buffalo (SUNY), Buffalo, NY; Harry M. Jol, University of Wisconsin, Eau Claire, WI

The session will cover a broad range of ground penetrating radar (GPR) studies related to stratigraphic analyses. Topics include reservoir and environmental site characterization, hydrogeophysics, geological hazard investigation, and stratigraphic-facies analyses of geomorphic environments (including eolian, fluvial, glacial, and coastal). ORAL and POSTER

T124 The Geologic Record of Biosphere Dynamics—The Key to Understanding the Biotic Effects of Future Environmental Change

GSA Geobiology and Geomicrobiology Division

Geomicrobiology

Karl W. Flessa, University of Arizona, Tucson, AZ; David A. Feary, National Research Council, Washington, D.C.

This session will focus on a recent National Research Council report that proposes strategies for integrating earth and biological sciences as a means of understanding biotic response to environmental change, and recommends programmatic, infrastructural, and management changes to best advance this emerging interdisciplinary science area. ORAL

T125 Geology and Paleoecology of the Beringian Subcontinent: To Honor the Career of David M. Hopkins

Alaska Quaternary Center (AQC)

Quaternary Geology/Geomorphology; Paleoclimatology/Paleoceanography; Archaeological Geology

Sarah J. Fowell, University of Alaska, Fairbanks, AK; Patricia Heiser, University of Alaska, Anchorage, AK

The concept of Beringia as a subcontinent with a unique flora and fauna can be largely attributed to David M. Hopkins. This session will highlight current research by Dave's students, coworkers, and colleagues. Presentations should focus on advances in Beringian paleoecology and future research directions. ORAL and POSTER

T126 Testing Rodinia Using New Maps Compiled for Each Craton through IGCP 440

GSA Structural Geology and Tectonics Division, International Geologic Correlation Project; Tectonics Special Research Center

Tectonics; Precambrian Geology

Karl E. Karlstrom, University of New Mexico, Albuquerque, NM; Svetlana V. Bogdanova, University of Lund, Lund, Sweden

The pre-Pangean supercontinent of Rodinia has been the subject of debate since it was proposed over a decade ago. This session will present results from an international correlation project (IGCP 440) designed to compile new data from each craton to test some of the numerous models for the shape, evolution, and even the existence of Rodinia. ORAL

Channeled Scablands. Dry Falls State Park, Washington. Photo by John Karachewski.

T127 New Perspectives on Neoproterozoic–Early Paleozoic Development of Western Laurentia: In Honor of John Cooper

Stratigraphy; Sediments, Carbonates; Sediments, Clastic

Mike Pope, Washington State University, Pullman, WA; Chris Fedo, George Washington University, Washington, D.C.

This session will examine new perspectives (e.g., detrital zircon geochronology, LA-MC-ICP-MS, detailed sequence stratigraphy, isotope chemostratigraphy, geobiology, etc.) that are being used to determine the Neoproterozoic–Early Paleozoic development of western Laurentia. ORAL and POSTER

T128 Barremian to Turonian Carbonate Platform Facies in Northeastern Mexico, their Paleogeographic, Paleoceanic, and Paleoclimatic Implications: Comparison with Coeval Facies Elsewhere in the Tethys (Posters)

Stratigraphy; Paleoclimatology/Paleoceanography; Sediments, Carbonates

Florentin J. Maurrasse, Florida International University, Miami, FL

Comparison of Lower to Upper Cretaceous facies of northeastern Mexico with coeval deposits around the Tethys for a better understanding of spatial and temporal changes in relation to the paleogeography, paleoceanography, and paleoclimate of that time interval. POSTER

T129 The Jurassic System of North America: Stratigraphy, Tectonics, and Depositional History (Posters)

GSA Structural Geology and Tectonics Division

Stratigraphy; Tectonics; Sediments, Clastic

William C. Parcell, Wichita State University, Wichita, KS

This session will focus on the depositional and tectonic evolution of North America during the Jurassic Period. We encourage contributions that discuss the causal relationships between sedimentologic processes, tectonic events, and the resulting stratigraphic record during this period. POSTER

T130 Advances in Understanding Fault Mechanics: Beyond Mohr-Coulomb

GSA Structural Geology and Tectonics Division

Structural Geology; Geophysics/Tectonophysics/Seismology; Neotectonics/Paleoseismology

Juliet G. Crider, Western Washington University, Bellingham, WA

In the years since Anderson's "Dynamics of Faulting," many other approaches to faulting have been proposed, but few are as widely applied. This session will review and advance alternative or supplemental theories for understanding how faults work, plus highlight successful field applications of new or alternative approaches. ORAL

T131 Seismogenic Friction and Pseudotachylites

GSA Structural Geology and Tectonics Division, GSA Geophysics Division

Structural Geology; Geophysics/Tectonophysics/Seismology; Tectonics

Eric C. Ferre, Southern Illinois University, Carbondale, IL; Joseph L. Allen, Concord College, Athens, WV; Kieran O'Hara, University of Kentucky, Lexington, KY

Fault-related pseudotachylites are the fascinating product of coseismic deformation occurring during large magnitude earthquakes. This session will present a blend of new results from structural geology, seismology, rock magnetism, geochemistry, mineralogy, and geochronology. ORAL and POSTER

T132 Understanding Coupled Metamorphic and Deformational Processes: Advances in Integrated Textural, Chemical, and Microstructural Analysis

GSA Structural Geology and Tectonics Division; Mineralogical Society of America

Structural Geology; Petrology, Metamorphic; Tectonics

Gary S. Solar, SUNY College, Buffalo, NY; Aaron Stallard, University of Canterbury, Christchurch, New Zealand

Innovative combination of petrologic, geochemical, and structural analysis reveals the dynamics between synchronous metamorphism and deformation. Speakers will address these relations using established and new techniques of investigating textures and chemistry in deformed metamorphic rocks to illustrate our understanding of these processes. ORAL and POSTER

T133 Exhumation Along Major Continental Strike-Slip Fault Systems

GSA Structural Geology and Tectonics Division

Tectonics; Structural Geology; Petrology, Metamorphic

Sarah Roeske, University of California, Davis, CA; Alison Till, U.S. Geological Survey, Anchorage, AK; Dwight Bradley, U.S. Geological Survey, Anchorage, AK

Exhumation of metamorphic rocks along transcurrent faults occurs in both extension and contraction environments. This session seeks contributions from researchers examining this process in active or ancient orogens and/or by analogue or numerical modeling. ORAL and POSTER

T134 The Columbia River Flood Basalts: New Insights into the Volcanism, Petrology, and Tectonism of a Large Igneous Province

GSA Structural Geology and Tectonics Division

Volcanology; Petrology, Igneous; Tectonics

Heather L. Petcovic, Oregon State University, Corvallis, OR; Bart S. Martin, Ohio Wesleyan University, Delaware, OH; Stephen P. Reidel, Pacific Northwest National Lab and Battelle Memorial Institute, Richland, WA

We seek papers covering a broad range of topics, including: the origin of the Columbia River Flood Basalts, lava emplacement rates and mechanisms, magma petrogenesis and geochemical modification, and tectonic history of the Columbia Plateau. ORAL and POSTER

T135 Hydrothermal Alteration on Active Volcanoes: Processes, Rates, and Applications to Hazards and Resources

Society of Economic Geologists

Economic Geology; Volcanology; Geochemistry, Other

David A. John, U.S. Geological Survey, Menlo Park, CA; Thomas W. Sisson, U.S. Geological Survey, Menlo Park, CA

Study of hydrothermal alteration traditionally has been undertaken by economic geologists interested in mineral and geothermal resources. This session aims at bringing together researchers from many disciplines to present new research results on the processes that form hydrothermal alteration on active volcanoes and applications of these results. ORAL

T136 Shallow Submarine Hydrothermal Vents: Geology, Geochemistry, and Biota

Marine/Coastal Science

Rosa Ma. Prol-Ledesma, Universidad Nacional Autónoma de México, México DF, México; Carles Canet, Universidad Nacional Autónoma de México, México D.F., México; Matthew J. Forrest, Moss Landing Marine Labs, Moss Landing, CA

This session will address the unique qualities of the mineralogy and biota observed around shallow-water hydrothermal vents. The geochemistry of the vent fluids is the result of mixing of thermal reservoir water and seawater, and is influenced by the microbial activity present at the vents. ORAL and POSTER

T137 Submarine Hydrothermal Systems: The Emergence of Geobiology

Geomicrobiology; Volcanology; Geochemistry, Other

Deborah S. Kelley, University of Washington, Seattle, WA; John Baross, University of Washington, Seattle, WA

The connection between volcanism and life perhaps is nowhere more evident than at mid-ocean ridges. This session will focus on new discoveries surrounding linkages among crustal formation, hydrothermal vents, and life at mid-ocean ridge spreading centers. ORAL and POSTER

T138 From Oxides to Anorthosites: A Tribute to D.H. Lindsley

Mineralogical Society of America; Geochemical Society

Petrology, Experimental; Petrology, Igneous; Mineralogy/Crystallography

Hanna Nekvasil, State University of New York, Stony Brook, NY; B. Ronald Frost, University of Wyoming, Laramie, WY

This session will focus on new contributions to phase stability and thermodynamics of igneous minerals and melts, and the origin and evolution of rocks in intraplate regimes, especially anorthosites and associated rocks. ORAL and POSTER

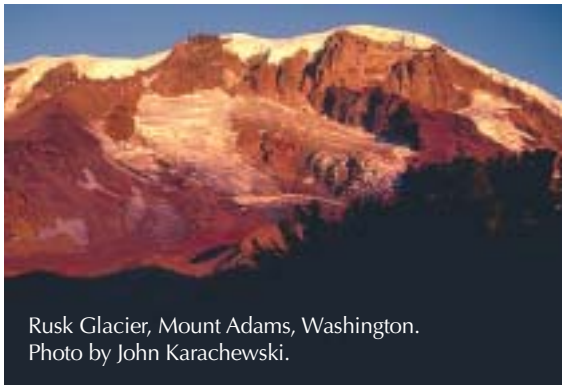
T139 Granites at Convergent Margins: Physical and Chemical Constraints on Processes and Petrogenesis

Mineralogical Society of America

Petrology, Igneous; Structural Geology; Geochemistry, Other

Paul B. Tomascak, University of Maryland, College Park, MD; Scott Paterson, University of Southern California, Los Angeles, CA

We seek papers on investigations of granites and granophile mineral deposits at modern and ancient convergent margins. Of primary interest: studies underscoring the importance of integrated field-structural-geophysical-geochronological-geochemical techniques, and



Rusk Glacier, Mount Adams, Washington. Photo by John Karachewski.

novel laboratory studies. ORAL and POSTER

T140 Modeling Metamorphism: Petrology, Geochemistry, and Tectonics

Mineralogical Society of America, Geochemical Society; GSA Structural Geology and Tectonics Division

Petrology, Metamorphic; Geochemistry, Other; Tectonics

Michael Brown, University of Maryland, College Park, MD; Barbara L. Dutrow, Louisiana State University, Baton Rouge, LA

This session encourages contributions from a wide variety of subdisciplines that use modeling to understand the petrology, geochemistry, and tectonics of lithosphere evolution: from nucleation and growth of crystals to orogenesis, from fluid flow to melting, and from quantifying extensive variables to understanding the rheology of metamorphic belts. ORAL and POSTER

T141 Phase Relations, High *P-T* Terrains, *P-T*-ometry and Plate Pushing: A Tribute to W.G. Ernst

Mineralogical Society of America

Petrology, Metamorphic; Petrology, Igneous; Tectonics

Sorena S. Sorensen, Washington, D.C.; Mark Cloos, University of Texas, Austin, TX; M. Charles Gilbert, University of Oklahoma, Norman, OK

A Gary Ernst tribute: mineral and rock phase relations, field relations of high *P-T*, UHP, and arc terrains, subduction zone tectonics and evolution, plate tectonic synthesis of orogenic belts, and earth science writ large. ORAL and POSTER

T142 Structure and Stratigraphy: New Perspectives on Lithotectonic Processes

GSA Structural Geology and Tectonics Division

Structural Geology; Stratigraphy

Mark P. Fischer, Northern Illinois University, De Kalb, IL; David Anastasio, Lehigh University, Bethlehem, PA

Variability in structures and structural processes are controlled by sedimentological and stratigraphic variables operating at multiple scales. Examples include fold and fault geometries, strain partitioning, and mesoscopic deformation patterns. This session showcases research that integrates structural and stratigraphic analyses. ORAL and POSTER

T143 Earthquake Geology in Reverse-Faulting Terrains

GSA Quaternary Geology and Geomorphology Division

Neotectonics/Paleoseismology; Quaternary Geology/Geomorphology; Structural Geology

Alan R. Nelson, U.S. Geological Survey, Denver, CO; Brian L. Sherrod, U.S. Geological Survey, Seattle, WA

Earthquake geology—study of the kinematics, history, and effects of earthquakes and related earth movements—requires diverse and innovative approaches in regions of active reverse faulting and folding. We encourage contributions about approaches and techniques applicable to the recently glaciated, heavily forested U.S. Pacific Northwest. ORAL and POSTER

T144 Tectonics of the Circum-Pacific Rim in Space and Time: Focus on Alaska, Central and South America, and the Western Pacific

GSA International Division; U.S. National Committee on the Geological Sciences; Circum-Pacific Council; GSA Structural Geology and Tectonics Division

Tectonics; Petrology, Igneous; Geophysics/Tectonophysics/Seismology

Suzanne Mahlburg Kay, Cornell University, Ithaca, NY; Mark Cloos, University of Texas, Austin, TX

Comparative and specific studies of the Circum-Pacific rim lead to new insights on the relative importance of tectonic factors controlling subduction processes. Interdisciplinary papers that consider broad aspects of all or parts of the rim are encouraged. ORAL and POSTER

T145 The Washington Cascades: An Integrated Perspective on 100 Million Years of Orogenesis, Magmatism, and Surface Processes

GSA Geophysics Division; GSA Structural Geology and Tectonics Division

Tectonics; Quaternary Geology/Geomorphology; Petrology, Igneous

Peter W. Reiners, Yale University, New Haven, CT; Donna L. Whitney, University of Minnesota, Minneapolis, MN

The Cascades orogen in Washington is a regional tectonic, topographic, and climatic transition zone. The session will examine the structural, petrologic, geophysical, and geomorphic evolution of the Cascades, including relationships between petrologic/tectonic events and surficial processes and mechanisms, timing, and rates of uplift and erosion. ORAL and POSTER

T146 Collisional Tectonics of the Northwest Cordillera: Integration of New Data in Basin Development, Magma Petrogenesis, Geophysics, Structural, and Metamorphic Analysis (Posters)

GSA Structural Geology and Tectonics Division

Tectonics; Stratigraphy; Petrology, Igneous

Ronald B. Cole, Allegheny College, Meadville, PA; Kenneth D. Ridgway, Purdue University, West Lafayette, IN

A forum for new data on terrane accretion processes in southern Alaska and western Canada. Emphasis on structures, basins, and arc systems along terrane suture zones and across terrane assemblages and on plate kinematics related to terrane collision. POSTER

T147 Crustal Character of the Northwestern Cordilleran Continental Margin

GSA Geophysics Division; GSA Structural Geology and Tectonics Division

Geophysics/Tectonophysics/Seismology; Tectonics

R.W. Saltus, U.S. Geological Survey, Denver, CO; T.L. Hudson, Applied

Needles–Gray Wolf Lithic Assemblage from Deer Park, Olympic National Park, Washington. Photo by John Karachewski.

Students: Apply for Travel Grants Today

The GSA Foundation has awarded $4,500 in grants 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, contact your GSA Section secretary:

CORDILLERAN
Joan E. Fryxell
(909) 880-5311
cordsect@csusb.edu

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Elizabeth Y. Anthony
(915) 747-5483
eanthony@geo.utep.edu

SOUTHEASTERN
Donald W. Neal
(252) 328-4392
neald@mail.ecu.edu

Call for Papers

Geology, Sequim, WA; D.B. Snyder, Geological Survey of Canada, Ottawa, ON

Presentation of seismic, gravity, and magnetic interpretations (particularly multidisciplinary transects), as well as complimentary studies, that elucidate the full crustal character along the complex continental margin of the northwestern Cordillera. ORAL and POSTER

T148 The Cascade Volcanic Arc System

Volcanology; Geophysics/Tectonophysics/Seismology; Tectonics

Patrick Muffler, U.S. Geological Survey, Menlo Park, CA; Richard J. Blakely, U.S. Geological Survey, Menlo Park, CA

This session seeks to integrate geological, geochemical, geophysical, and tectonic studies of the Cascade Range into a better understanding of what constitutes the Cascade volcanic arc as a system. Our theme is "connectivity." Speakers are encouraged to look beyond their pieces of real estate and truly integrate beyond their specialties. ORAL and POSTER

T149 Seismic Hazards and Neotectonics in Southern Nevada (Posters)

GSA Geophysics Division

Tectonics; Geophysics/Tectonophysics/Seismology; Neotectonics/Paleoseismology

Catherine M. Snelson, University of Nevada, Las Vegas, NV; Wanda J. Taylor, University of Nevada, Las Vegas, NV

Recent studies have provided new insights into the neotectonics in southern Nevada. As a result, interest has increased in the seismic hazard assessment, which is particularly important in light of the population growth in Southern Nevada. This session will bring together new and existing studies to address the seismic hazard issues that face the region. POSTER

T150 New Views of Seismic Hazard in Cascadia I: Seismology and Seismotectonics

GSA Geophysics Division

Geophysics/Tectonophysics/Seismology; Neotectonics/Paleoseismology; Structural Geology

Thomas M. Brocher, U.S. Geological Survey, Menlo Park, CA; Kate C. Miller, University of Texas, El Paso, TX; Thomas L. Pratt, U.S. Geological Survey, Seattle, WA

This session showcases latest advances in our understanding of the structural framework, seismotectonics, and site response in Cascadia. Papers will include new results from site response studies in the Seattle basin, crustal imaging of the forearc, monitoring silent-slip events along the megathrust, and studies of the 2001 Nisqually earthquake. ORAL and POSTER

T151 New Views of Seismic Hazard in Cascadia II: Neotectonics of the Cascadia Forearc

GSA Structural Geology and Tectonics Division

Neotectonics/Paleoseismology; Tectonics; Quaternary Geology/Geomorphology

Samuel Y. Johnson, U.S. Geological Survey, Lakewood, CO; Ray E. Wells, U.S. Geological Survey, Menlo Park, CA

Multidisciplinary studies of convergent margin deformation and its relation to contemporary strain in the Cascadia forearc, northern California to southern British Columbia. ORAL

T152 Global Climate Changes: Abrupt Late Pleistocene Climatic Reversals and Modern Global Warming

GSA Quaternary Geology and Geomorphology Division

Don J. Easterbrook, Western Washington University, Bellingham, WA; Edward B. Evenson, Lehigh University, Bethlehem, PA; John Gosse, Dalhousie University, Halifax, NS

This session will explore global, Late Pleistocene, rapid climatic changes, focusing on the Younger Dryas and Intra-Allerod Cold Period and aspects of global warming during the past century and earlier natural climatic changes. ORAL

HOW TO SUBMIT YOUR ABSTRACT

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

From the home page of www.geosociety.org, click on "Submit an Abstract" and follow the steps given. If you lose your Internet connection before you are finished, you can resume making a submission when you log back on.

You and your coauthors will be provided (by e-mail) with a record of the abstract identification number and password, and you can access your abstract and revise it as necessary from any Internet connection up until the published abstract submission deadline date (July 15).

The system supports the submission of complex abstracts that contain subscripts, superscripts, italic and boldface type, tables, Greek letters, and equations.

SCIENTIFIC CATEGORIES

Determine if your paper would fit neatly under one of the topical sessions. If it doesn't, please submit your abstract for inclusion in the general discipline sessions. The available choices are:

Archaeological Geology
Coal Geology
Economic Geology
Engineering Geology
Environmental Geoscience
Geochemistry, Aqueous
Geochemistry, Organic
Geochemistry, Other
Geomicrobiology
Geophysics/Tectonophysics/Seismology
Geoscience Education
Geoscience Information/Communication
History of Geology
Hydrogeology
Limnogeology
Marine/Coastal Science
Mineralogy/Crystallography
Neotectonics/Paleoseismology
Paleoclimatology/Paleoceanography
Paleontology/Paleobotany
Petrology, Experimental
Petrology, Igneous
Petrology, Metamorphic
Planetary Geology
Precambrian Geology
Public Policy
Quaternary Geology/Geomorphology
Remote Sensing/Geographic Info System
Sediments, Carbonates
Sediments, Clastic
Stratigraphy
Structural Geology
Tectonics
Volcanology

PRESENTATION MODES

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.

Oral Mode. This is a verbal presentation before a seated audience. The normal length of an oral presentation is 12 minutes, plus three minutes for discussion.

Poster Mode. Each poster session presenter is provided with one horizontal, free-standing display board approximately 8' wide and 4' high. Precise measurements will appear in the Speaker Guide, which will be posted on the GSA Web site in September. The speaker must be in the poster booth for at least two of the four presentation hours.

Papers for discipline sessions may be submitted in either oral or poster mode. Papers for topical sessions are to be submitted *only* in the mode noted in the session description. If a topical abstract is submitted in the incorrect mode, the abstract will be transferred automatically to a discipline session.

ABSTRACT BODY

Please keep it to 2,000 characters or fewer. The online abstract system will reject it if it exceeds this limit.

If you want to include a table with your abstract, you may. But understand that the table might reduce the number of words allowed in your abstract. Taken together, the body of the abstract should take up no more space than would be occupied by roughly 2,000 characters alone.

Check the spelling of the abstract's body and title using your own word processor. Then read it again and make sure that it is something the whole world should see. (We won't check or edit it for you.)

For typing and pasting, add an extra line between paragraphs or they will run together when displayed (you can do this before copying or after pasting, or while typing).

ABSTRACT FEE

Once the abstract is in place, a window to submit payment will appear. The non-refundable submission fee is $18 for all students; $30 for all others.

You May Present Only <u>One</u> Volunteered Abstract

- Please submit only one *volunteered* abstract as speaker or poster presenter in topical and/or discipline sessions. This helps avoid speaker-scheduling conflicts and gives everyone an equal opportunity to be heard. Multiple submissions as speaker-presenter will result in rejection of all abstracts.
- This limitation does not apply to, nor does it include, *invited* contributions to keynote symposia or topical sessions.

JTPC TO FINALIZE PROGRAM IN MID-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.

Seattle 2003 Field Trips

The 2003 GSA Annual Meeting in Seattle will provide geoscientists a diverse suite of field trips that take full advantage of the region's unique geologic setting. The geologic history of this region is particularly complex and interesting because of the accretion of exotic terranes to the western margin of North America over the past 200 million years, the most recent being the Olympic Mountain terrane. Furthermore, the advance and retreat of continental and alpine glacial systems throughout the Quaternary has left an extensive erosional and depositional record above the older rock record.

Our field trip schedule offers participants an opportunity to study geologic processes through the Cambrian to modern time. Included in our program are one-day trips to observe and discuss local geologic features and processes (i.e., mass wasting, volcanic and seismic processes) that have both regional and societal implications. We also have a broad choice of multi-day field trips that will offer participants an opportunity to visit some of most scenic and geologically interesting locations in the Pacific Northwest and beyond.

Most trips start and end in Seattle. Air travel plans that include a Saturday night stay can substantially offset field trip costs. The following list is tentative and subject to change. Further details will be given when registration for the meeting begins in June. For more information, contact the field trip leader or the 2003 field trip chair: Terry Swanson, Dept. of Earth and Space Sciences, University of Washington, Seattle, WA, (206) 543-1923, fax 206-543-0489, tswanson@u.washington.edu.

PREMEETING

Island and Coastal Hydrogeology of Hawaii

Sun.–Fri., Oct. 26–31. Stephen B. Gingerich, U. S. Geological Survey, 677 Ala Moana Blvd., #415, Honolulu, HI, 96813, (808) 587-2411, fax 808-587-2401, sbginger@usgs.gov; Stephen Wheatcraft. Max.: 20. Cost: $690. *Begins on the Big Island of Hawaii and ends on Oahu.*

Glacial Lake Missoula, Clark Fork Ice Dam and the Floods Outburst Area: Northern Idaho and Western Montana.

Wed.–Fri., Oct. 29–31. Norman Smyers, USDA Forest Service, Lolo National Forest, Bldg. 24, Fort Missoula, Missoula, MT 59804, (406) 329-3775, fax 406-329-3795, nsmyers@fs.fed.us; Roy Breckenridge. Max.: 42. Cost: $290. *Begins and ends in Spokane, Washington.*

Sequence Stratigraphy of the Sauk Sequence: 40th Anniversary Field Trip in Western Utah

Wed.–Sat., Oct. 29–Nov. 1. Kevin Evans, Dept. of Geography, Geology, and Planning, Southwest Missouri State University, Springfield, MO 65804, (417) 836-5590, fax 417-836-6006, kre787f@smsu.edu; Jim Miller; Ben Dattilo. Max.: 30. Cost: $295. *Begins and ends in Salt Lake City, Utah.*

Tectonic Geomorphology and the Record of Quaternary Plate Boundary Deformation in the Olympic Mountains

Wed.–Sat., Oct. 29–Nov. 1. Frank J. Pazzaglia, Dept. of Earth and Environmental Sciences, Lehigh University, 31 Williams, Bethlehem, PA 18015, (610) 758-3667, fax 610-758-3677, fjp3@lehigh.edu; Glenn Thackray; Mark T. Brandon; Eric McDonald; John Gosse; Karl Wegmann. Max.: 24. Cost: $525.

Wine and Geology—The Terroir of Washington State

Thurs.–Fri., Oct. 30–31. Cosponsored by *Society of Economic Geologists.* Lawrence D. Meinert, Dept. of Geology, Washington State University, Pullman, WA, 99164-2812, (509) 335-2261, fax 509-335-7816, meinert@wsu.edu; Alan J. Busacca. Max.: 44. Cost: $315.

Coastal Evolution, Dynamic Shoreline Processes, and Beach Management Controversies of the Columbia River Littoral Cell, Southwest Washington and Northern Oregon

Thurs.– Sat., Oct. 30– Nov. 1. Sandy Vanderburgh, Dept. of Geography, University College of the Fraser Valley, 33844 King Road, Abbotsford, British Columbia, Canada, V2S 7M8, (604) 504-7441, ext. 4336, fax 604-855-7558, vanderburghs@ucfv.bc.ca; Guy Gelfenbaum; Curt Peterson; Harry Jol; Jim Phipps. Max.: 40. Cost: $415.

Columbia River Basalt and Yakima Fold Belt Field Trip

Thurs.–Sat., Oct. 30–Nov. 1. Stephen Reidel, Pacific Northwest National Laboratory, K6-81, P.O. Box 999, Richland, WA 99352, (509) 376-9932, fax 509-376-5368, sp.reidel@pnl.gov; Bart Martin; Heather Petcovic. Max.: 22. Cost: $290.

Cretaceous to Paleogene Cascades Arc: Structure, Metamorphism, and Time Scales of Magmatism, Burial, and Exhumation of a Crustal Section

Thurs.–Sat., Oct. 30–Nov. 1. Cosponsored by *GSA Structural Geology and Tectonics Division*. Robert Miller, Dept. of Geology, San Jose State University, San Jose, CA 95192-0102, (408) 924-5025, fax 408-924-5053, rmiller@geosun.sjsu.edu; Jennifer Matzel; Scott Paterson; Harold Stowell. Max.: 35. Cost: $305.

Pleistocene Glaciation of the Puget Lowland, North Cascades, and Columbia Plateau

Thurs.–Sat., Oct. 30–Nov. 1. Don J. Easterbrook, Dept. of Geology, Western Washington University, Bellingham, WA 98225, (360) 650-3583, fax 360-650-7302, dbunny@cc.wwu.edu. Max.: 24. Cost: $340.

Engineering Geology in the Central Columbia Valley

Fri.–Sat., Oct. 31–Nov. 1. Cosponsored by *GSA Engineering Geology Division* and *Association of Engineering Geologists.* Tom Badger, Washington State Department of Transportation, P.O. Box 47365, Olympia, WA 98504-7365, (360) 709-5461, fax 360-709-5585, badgert@wsdot.wa.gov; Dick Galster. Max.: 24. Cost: $200.

Regional Tertiary Sequence Stratigraphy and Regional Structure on the Eastern Flank of the Central Cascade Range, Washington

Fri.–Sat., Oct. 31–Nov. 1. Cosponsored by *Northwest Geological Society*. Eric S.

Cheney, Dept. of Earth and Space Sciences, University of Washington, Box 351310, Seattle, WA 98195-1310, (206) 543-1190, fax 206-543-3836, vaalbara@u.washington.edu. Max.: 21. Cost: $245.

Holocene Lahars Along the White River Between Mount Rainier and Seattle

Sat., Nov. 1. Paul Zehfuss, Dept. of Earth and Space Sciences, University of Washington, Box 351310, Seattle, WA 98195-1310, (206) 543-6229, fax 206-685-2379, pzehfuss@u.washington.edu; Brian Atwater; James Vallance. Max.: 20. Cost: $140.

Late Pleistocene Glacial History of Whidbey Island, Washington

Sat., Nov. 1. Terry W. Swanson, Quaternary Research Center, Dept. of Earth and Space Sciences, University of Washington, Box 351310 Seattle, WA 98195-1310, (206) 543-1923, fax 206-543-0489, tswanson@u.washington.edu. Max.: 44. Cost: $95.

Pleistocene Tephrostratigraphy and Paleogeography of Southern Puget Sound Near Olympia, Washington

Sat., Nov. 1. Timothy J. Walsh, Washington DNR, Division of Geology and Earth Resources, P.O. Box 47007, Olympia, WA 98504-7007, (360) 902-1432, fax 360-902-1785, tim.walsh@wadnr.gov; Robert L. Logan; Michael Polenz; Marvin A. Lanphere; Thomas W. Sisson. Max.: 20. Cost: $210.

Recent Geoarchaeological Discoveries in Central Washington

Sat., Nov. 1. Cosponsored by *GSA Archaeological Geology Division*. Gary Huckleberry, Dept. of Anthropology, Washington State University, Pullman, WA 99164-4910, (509) 335-4807, fax 509-335-3999, ghuck@wsu.edu; Jerry Galm; Stan Gough; Brett Lenz. Max.: 34. Cost: $80.

POSTMEETING

Evolution of a Polygenetic Ophiolite: The Jurassic Ingalls Ophiolite, Washington Cascades

Wed.–Fri., Nov. 5–7. Gregory Harper, Dept. of Earth and Atmospheric Sciences, SUNY, Albany, NY 12222, (518) 442-4476, fax 518-442-5825, gdh@albany.edu; Robert Miller; Jonathan Miller. Max.: 30. Cost: $250.

Geohydrology of the Hanford Nuclear Waste Site in the South-Central Columbia Plateau

Wed.–Fri., Nov. 5–7. Roy E. Gephart, Pacific Northwest National Laboratory, P.O. Box 999, Mail Stop K8-88, Richland, WA 99352, (509)376-1421, fax 509-376-0846, roy.gephart@pnl.gov; Steve Reidel; Frank Spane; Karl Fecht. Max.: 20. Cost: $240. *Due to security restrictions, only U.S. citizens can enter the Hanford Site on this tour.*

Puget Sound Paleoseismology

Thurs.–Fri., Nov. 6–7. Brian Sherrod, U.S. Geological Survey, Dept. of Earth and Space Sciences, Box 351310, University of Washington, Seattle, WA 98195, (206) 553-0153, fax 206-553-8350, bsherrod@ess.washington.edu; Alan Nelson; Harvey Kelsey; Carrie Garrsion-Laney. Max.: 45. Cost: $170.

Hydrogeology of Cascade Range Volcanoes: Mount St. Helens, Mount Hood, and Central Oregon

Thurs.–Sat., Nov. 6–8. Cosponsored by *GSA Hydrogeology Division*. Steve Ingebritsen, U.S. Geological Survey, MS 439, 345 Middlefield Road, Menlo Park, CA 94025, (650) 329-4422, fax 650-329-4463, seingebr@usgs.gov; Terry Keith; Michael Manga; Larry Mastin. Max.: 40. Cost: $370.

Quaternary Geology of Seattle

Thurs., Nov. 6. Cosponsored by *GSA Quaternary Geology and Geomorphology Division*. Kathy Goetz Troost, Dept. of Earth and Space Sciences, University of Washington, Box 351310, Seattle, WA 98195-1310, (206) 616-9769, fax 206-543-8954, ktroost@u.washington.edu; Derek Booth; Bill Laprade. Max.: 45. Cost: $105.

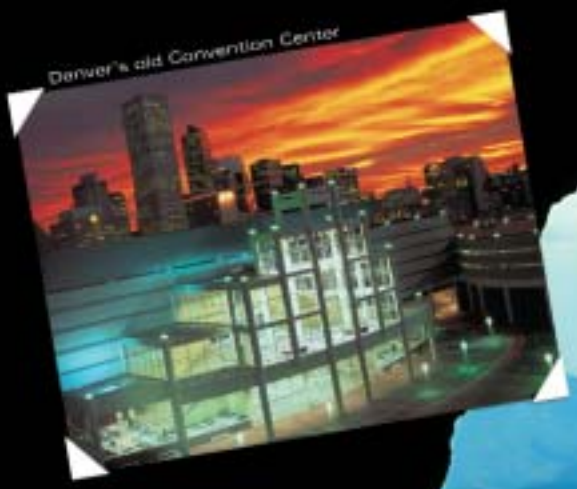
SEG FIELD TRIP

Hydrothermal Alteration in Ancient and Modern Volcanoes, Mount Rainier Area: Applications to Ore Genesis and Volcanic Hazards

Thurs., Nov. 6. Sponsored by *Society of Economic Geologists*. David John; Roger Ashley; Grant Newport; James Vallance; James Rytuba, Society of Economic Geologists, 7811 Shaffer Parkway, Littleton, CO 80127, (720) 981-7882, fax 720-981-7874, seg@segweb.org. Max.: 35. Cost: TBD.

Denver's on the Horizon Again!

Start thinking about Denver for GSA's 116th Annual Meeting and Exposition!



November 7–10, 2004, Denver Colorado

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Mine adit Ice Lake, Front Range, CO. Photo by John Karachewski.

GSA-Sponsored Short Courses

Preregistration Deadline: September 26

Registration information and course descriptions will be published in the June issue of *GSA Today*. For additional information, contact Edna Collis, GSA headquarters, ecollis@geosociety.org, or visit www.geosociety.org. (CEUs = continuing education units.)

Applications of Environmental Isotopes for Tracing Anthropogenic Contaminants in Groundwaters and Surface Waters

Sat., Nov. 1. Cosponsored by *GSA Hydrogeology Division*. Carol Kendall and Tom Bullen, Water Resources Division, U.S. Geological Survey, Menlo Park. Fee: $550. CEUs: 0.8.

DEMs: The Topographic Dimension for Visualizing Geology, Geomorphology, and Active Tectonics

Sat., Nov. 1. Cosponsored by *GSA Geoscience Education Division* and *GSA Structural Geology and Tectonics Division*. Peter L. Guth, U.S. Naval Academy, Annapolis, MD; Ralph Haugerud, U.S. Geological Survey, Seattle; Stephen J. Reynolds, Arizona State University; Paul Morin, University of Minnesota. Fee: $650. CEUs: 0.8.

Managing Environmental Projects

Sat., Nov. 1. Cosponsored by *GSA Engineering Geology Division*. Raymond C. Kimbrough, P.E. LaMoreaux & Associates, Inc., Tuscaloosa, Alabama. Fee: $500. CEUs: 0.8.

New Satellite Data and Processing Techniques for the Field Geologist

Sat., Nov. 1, Cosponsored by *GSA Quaternary and Geomorphology Division*. Tom G. Farr, Jet Propulsion Laboratory, Pasadena, CA; John C. Dohrenwend, Southwest Satellite Imaging, Teasdale, UT, Fee: $525. CEUs: 0.8.

EXHIBITS

Have you got a product to sell?
A new service to unveil?
A school or program to promote?

The GSA Annual Meeting Exhibit Hall showcases more than 200 organizations offering the latest in scientific instrumentation; field supplies and gear; geological publications; laboratory services; gems, minerals, and fossils; and information on earth science programs at various institutions.

Find out more about our current 2003 exhibitors by visiting our Web site at www.geosociety.org. Exhibitors can reach more than 6,100 influential and key decision-makers from the geoscience community, meeting face-to-face with attendees and developing new customers, increasing sales, and educating current and potential customers on products and services. Exhibit with us in 2003—it will be a successful and rewarding experience for everyone!

For more information on becoming an exhibitor, contact Darline Daley with Quality Business Services, (303) 914-0695 or darline@qbsoffice.com.

Other Courses and Panels

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

Sequence Stratigraphy for Graduate Students

Fri.–Sat., Oct. 31–Nov. 1. Free short course for graduate students. Cosponsored by *ExxonMobil* and *British Petroleum (BP)*. Instructors: Kirt Campion (ExxonMobil) and Art Donovan (BP). Information: Kirt Campion, kirt.m.campion@exxonmobil.com.

Bridging the Gap: Trends in Ostracode Biological and Geological Sciences

Sat., Nov. 1. Sponsored by *Paleontological Society*. Organizers: Lisa Park, Dept. of Geology, University of Akron, 252 Buctel Commons, Akron, OH 44325-4101, (330) 972-7630, fax 330-972-7611, lepark@uakron.edu; Alison Smith.

Diversity Issues in Geoscience Fields—A Panel Discussion

Mon., Nov. 3. Sponsored by *National Association of Black Geologists and Geophysicists*. Information: Conrad K. Allen, ExxonMobil, 396 West Greens Road, P.O. Box 4697, Houston, TX 77210-4697, (713) 431-1365, conradallen@msn.com.

K–16 PROGRAM

Attention College Faculty, K–12 Teachers, Teacher Trainers, and Pre-Service Teachers:

Look for the K–16 Education Workshops listing in the June issue of *GSA Today*.

Questions? Contact Julie Sexton at jsexton@geosociety.org or (303) 357-1005 for more information.

Seattle 2003 Registration Information

Preregistration Deadline: Friday, September 26

Cancellation Deadline: Friday, October 3

Registration information will be available in the June issue of *GSA Today* and on the GSA Web site, www.geosociety.org, in early June.

Meeting registration fees have NOT been established as we go to print. However, for your budgeting and travel authorization requests, please use the *estimated* preregistration fees printed here. Final fees will be published in the June issue of *GSA Today*.

You will save a substantial amount on your registration fee by becoming a GSA member—almost exactly what you would pay to join GSA. That's like joining GSA for free! For further information, contact GSA Sales and Service at GSA headquarters, gsaservice@geosociety.org or 1-888-443-4472.

LODGING

Seattle offers high-quality, affordable hotel rooms for meeting attendees. GSA has booked rooms at 11 hotels, offering special convention rates ranging from $73 to $190 per night. The headquarters hotel is the Sheraton Seattle. Most activities will take place at the Washington State Convention & Trade Center and the Sheraton Seattle. Additional housing information will be included in the June issue of *GSA Today*.

ESTIMATED REGISTRATION FEES

	Preregistration		On-Site	
	FULL MEETING	ONE DAY	FULL MEETING	ONE DAY
Professional Member	$295	$190	$375	$200
Professional Member 70 or older	$240	$135	$315	$145
Professional Nonmember	$375	$215	$465	$225
Student Member or Student Associate	$90	$60	$120	$60
Student Nonmember	$120	$75	$150	$75
Guest or Spouse	$80	N/A	$80	N/A
K–12 Professional	$40	N/A	$40	N/A
Short Course or Field Trip Only	$40	N/A	$40	N/A

Guests Invited!

Make plans now to participate in the GSA Guest Program at the Annual Meeting in Seattle, and get ready to be pampered! GSA extends a warm welcome to all spouses, family members, and friends to register for the Guest Program.

The guest or spouse registration fee of $80 per person is for non-geologist spouses or family members and friends of professional and/or student registrants to the GSA Annual Meeting. The guest registration fee is required to attend guest activities, gain entrance to the Exhibit Hall, attend seminars and workshops (to be listed in the June issue of *GSA Today*), and take advantage of refreshments in the Guest Hospitality Suite. Formal tours (also listed in the June issue of *GSA Today*) will be offered at an additional cost. Fees cover the cost of professional tour guides, round-trip transportation, admission fees, and gratuities. Reservations for all tours will be accepted on a first-come, first-served basis. Since the tour operator requires a final guarantee weeks in advance, most tours have attendance minimums and maximums. Please register early to guarantee your spot. Tours may be canceled if minimum attendance is not met.

The guest registration fee will NOT provide access to all 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.

Guest Hospitality Suite Hours
Sun.–Wed., Nov. 2–5
8 a.m.–5:30 p.m.

Registration for the Guest Program begins in June.
Look for the *GSA Today* June issue or register online at www.geosociety.org.

Employment Interview Service

GSA will again offer its Employment Interview Service. Each year, this program, together with the Roundtable Discussions, provides valuable networking opportunities in the geosciences. For more information, contact Nancy Williams at GSA headquarters, nwilliams@geosociety.org or go to the GSA Web site, www.geosociety.org.

Student Volunteer Opportunities

If you are a geology student and are planning on attending the GSA Annual Meeting in Seattle this November, consider volunteering and save money at the same time.

As a student volunteer, you can offset some of your cost of attending the annual meeting. If you volunteer just 12 hours of your time, you get one free meeting registration. If you volunteer 15 or more hours, you get one free meeting registration and one free Abstracts with Programs volume. In addition, GSA will award student volunteers a stipend of $20 for each 4 hours of volunteered time.

For more information, please contact Kevin Ricker at kricker@geosociety.org.

Graduate School Information Forum

DON'T DELAY: RESERVE YOUR SPACE *NOW!*

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.

GSIF will be located in the poster session hall and in the corridor leading to it. Traffic and visibility will be outstanding this year due to this location, which is adjacent to the exhibit hall. The forum will be open Sunday through Wednesday from 8 a.m. to 5:30 p.m. You may choose from one day to all four days. Space is extremely limited, and Sunday and Monday will be the first to sell out. *Those schools reserving multiple days will be assigned first and to the most visible booths.*

Participating schools will be promoted in the October *GSA Today,* the 2003 Annual Meeting Program and—NEW THIS YEAR—on the GSA Web site, with e-mail links so prospective students may schedule appointments prior to the Annual Meeting.

A new online Graduate School Program Posting opportunity will be available later this year that can help enhance visibility during the meeting and throughout the year. Participating GSIF schools will be eligible for significant discounts. Stay tuned for further details.

For more information or to reserve your space, contact Kevin Ricker at (303) 357-1090 or kricker@geosociety.org.

COMING ATTRACTIONS

FIELD FORUM SCHEDULED: Processes on the Early Earth

Cosponsored by *GSA and the Geological Society of South Africa*
July 4–9, 2004, Johannesburg, South Africa
Conveners: ***Wolf Uwe Reimold,*** reimoldw@geosciences.wits.ac.za;
Carl R. Anhaeusser; Roger L. Gibson; Ken A. Eriksson; Christian Koeberl; Bruce M. Simonson; Frances Westall.
Watch for details in the June issue of *GSA Today*.

REMINDER

PENROSE CONFERENCE SCHEDULED: Plume IV: Beyond the Plume Hypothesis—Tests of the Plume Paradigm and Alternatives

August 25–29, 2003 • Hveragerdi, Iceland • www.mantleplumes.org

Conveners: Gillian R. Foulger, Volcano Hazards Team, U.S. Geological Survey, 345 Middlefield Road, MS 910, Menlo Park, CA 94025-3591, USA, (650) 329-4143, fax 650-329-5203, foulger@swave.wr.usgs.gov; ***James H. Natland,*** Rosenstiel School of Marine and Atmospheric Science, University of Miami, 4600 Rickenbacker Causeway, Miami, FL 33149, USA, (305) 361-4123, fax 305-361-4632, jnatland@msn.com; ***Don L. Anderson,*** California Institute of Technology, Seismological Laboratory 252-21, Pasadena, CA 91125, USA, (626) 395-6901, fax 626-564-0715, dla@gps.caltech.edu

Description and venue. For complete details, see the March 2003 issue of *GSA Today* or visit www.geosociety.org (go to "Meetings & Excursions" then to "Penrose Conferences"). This conference, held in the village of Hveragerdi, South Iceland (www.south.is/hveragerdi.html), will bring together scientists who wish to be involved in developing fundamentally new models for volcanic provinces, innovative new ideas, and the experiments required to test them. It will emphasize petrology, geology, geophysics, geochemistry, modeling of midplate volcanism, and comparisons with plate boundary magmatism.

Iceland is the type example of a ridge-centered hotspot, and a current focus of debate between plume and non-plume models. It is the largest subaerial exposure of spreading plate boundary on Earth, and contains more than 15 spreading segments, two complex transform zones, and 35 active volcanoes. The conference venue is within the extinct Grensdalur volcano and hot-spring field, a component of the Reykjanes-Langjokull–South Iceland ridge–ridge-transform triple junction. Excellent hotel and conference facilities are available. One half-day and one full-day field trip will be conducted during the conference to tour the three branches of this triple junction. The cost of the five-day conference, including room, board, and field trips, is expected to be under $1,300.

Apply by May 10, 2003. Potential participants should send a letter to one of the conveners, including a brief statement of interests and anticipated contribution to the conference, and an extended abstract if an oral or poster presentation is offered. Discussion will be emphasized at the meeting, so the number of oral presentations will be limited. Preference will be given to contributions that focus on new models, rather than solely criticism of old ones. Attendance will be limited to 60 people. Graduate students are encouraged to apply, and some funds will be available to help offset costs for students and possibly also for delegates in need.

Registrants with Special Needs. GSA is committed to making Penrose Conferences accessible to all. If you require special arrangements or have special dietary concerns, please contact one of the conveners.

FIELD FORUM REPORT

Kinematics and Vorticity of High-Strain Zones

Conveners:

Christopher M. Bailey, *Geology, College of William & Mary, Williamsburg, VA 23187*

Andy Bobyarchick, *Geography and Earth Sciences, University of North Carolina, Charlotte, NC 28223*

Dazhi Jiang, *Geology, University of Maryland, College Park, MD 20742*

This GSA Field Forum brought together 20 geologists to examine high-strain zones and penetratively deformed rocks in the Virginia Piedmont and Blue Ridge. Recent years have brought to the fore many complex deformation models and the time was right to assemble geologists in the field to discuss what information *can* and *cannot* be gained about the kinematics and vorticity of naturally deformed rocks. Some key questions included: What structures in high-strain zones can be used to characterize mean vorticity and progressive vorticity changes during deformation? How are triclinic high-strain zones recognized? How does the recognition of triclinic symmetries influence kinematic and tectonic interpretations? Does the specific tectonic environment in which material is deformed influence the deformation path?

The forum was convened at the Graves Mountain Lodge, near Madison, Virginia, April 16–21, 2002. The first evening's presentation focused on the goals of the forum and provided a regional geologic overview. The first day in the field involved a traverse across the Piedmont. Stops included two quarries in the transpressional Hylas Zone, mylonitic biotite-rich gneiss in the Proterozoic Goochland terrane, and L-tectonites from the Columbia granodioritic gneiss. Discussions centered on how best to decipher rocks that have experienced multiple deformations, yet display only one penetrative fabric. The evening discussion reviewed the history of high-strain zones studies from simple shear in the classic "Ramsay & Graham" model to general shear models with triclinic symmetries.

The second day in the field involved a steep hike to debris flow scars on the edge of Shenandoah National Park in the Blue Ridge Mountains to examine a number of contractional high-strain zones. At these localities, undeformed charnockites are transformed into mylonites and the high-strain zone boundaries are well exposed. Discussions concerned how best to quantify strain in these mylonitic rocks; although there was a difference of opinion as to the total finite strain, all agreed that these rocks had experienced bulk general shear. At lunch, an energetic thunderstorm drove the group from the outcrops. The afternoon was spent drying off and examining amphibolite and greenschist facies high-strain zones in the eastern Blue Ridge. Discussions focused on the determination of strain symmetry and the pitfalls associated with mylonite geochronology. The evening session considered the implications of triclinic deformation models and how best to apply these models to natural examples. Although deformation models have proliferated in the past ten years, participants agreed that a robust kinematic understanding of real high-strain zones has been documented in only a few examples.

Stops on the third day included outcrops with high-temperature Grenville-age fabrics in Blue Ridge gneisses, penetratively deformed Neoproterozoic metasedimentary rocks, and anastomosing mm-scale to m-scale high-strain zones cutting massive granites. The highlight of day three was the Garth Run high-strain zone. This contractional high-strain zone is characterized by flattening strains and strong fabric asymmetries. On faces parallel to the elongation lineation and normal to the foliation, a top-to-the-northwest (reverse movement) sense of shear is present, but on faces normal to both foliation and lineation, a sinistral sense of shear predominates. The geometry of Garth Run mylonites appears triclinic, however, some argued that strain could be partitioned into complimentary triclinic domains that yield an overall monoclinic deformation symmetry. Folded pegmatite boudins at Garth Run were discussed as possible indicators of incremental vorticity changes during deformation.

The final field trip day included stops in the regionally significant Rockfish Valley high-strain zone. This zone is up to 2 km thick and generally poorly exposed. Discussions concerned how best to estimate total displacement in regional-scale zones. The final stop on the forum was at the Lawhorne Mill high-strain zone, a 300 m thick zone of mylonite derived from Blue Ridge granitoids. These mylonitic rocks have a well-developed down-dip lineation, but display only weakly asymmetric structures. Possible kinematic interpretations for this mylonite zone include pure shear dominated deformation or transpression with the mineral elongation lineation forming a rolling lineation at right angles to the transport direction.

The final evening session included informal presentations about ongoing kinematic research in the Himalayas, Basin and Range, and the Canadian Shield. The forum closed with a consensus that quantitative estimates of strain and vorticity in deformed rocks are valuable, even though these results generally provide non-unique solutions as to deformation path. Challenges for the future include testing existing vorticity indicators in three dimensional and triclinic deformations, developing new vorticity indicators, and elucidating deformation paths, not just finite strains and mean vorticities. It is clear that the kinematics of deformation is rarely simple, and in spite of space and compatibility "problems" with non-simple shear deformations, the evidence from Virginia and many other regions indicates that in the crust, general shear may be the rule rather than the exception.

Forum Participants

Christopher Bailey
Andy Bobyarchick
Brad Carter
Brooke Carter
Chris Connors
Pianhuan Dai
Scott Giorgis
Jim Hibbard
Dazhi Jiang
Rick Law
Shoufa Lin
Michelle Markley
Elizabeth McClellan
Lina Polvi
Mark Quigley
Corey Simonson
Matthew Strine
Basil Tikoff
Paul Williams
Steven Wojtal

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New GSA Members

The following 527 members were elected by GSA Council action at its October 2002 meeting for the period from April 2002 through September 2002.

Christopher G. Adams
Ryan N. Ahlersmeyer
Darin R. Albrecht
Nedra Alexander
Emily G. Allen
Aus A. Al-Tawil
Rachele Brooke Ambrose
Sridhar Anandakrishnan
Eric Anderson
James H. Anderson
John E. Anderson
Lindsay P. Anderson
Kenneth D. Angielczyk
Dermot M. Antoniades
Johan Arif
Muhammad Asim
Corey W. Askin
Mustafa A. Aycenk
Mina Azmoon
Takashi Azuma
Louis A. Baerga
Juli A. Bailey
Mark E. Baker
Tammy K. Baldwin
Susan L. Barbour Wood
Erica A. Barrow
Lorie Bartee
Liselle S. Batt
Sarah V. Battistini
Duane W. Bays
Mary Ellen Benson
Peter A. Bentham
Scott Beyer
Scott J. Bick
Tandis S. Bidgoli
Casey H. Billmayer
Kay H. Birdsell
James A. Bleil
Paul C. Bojesen
Carl H. Bolster
Roslyn Bonnar
Saumyaditya Bose
Angela L. Botzer
Alex Boughamer
Oliver Boyd
Tamara L. Boyd
Sandra S. Brake
Michelle A. Bricker
Marc-Andre Brideau
Aileen M. Bright
Charles F. Brush
Jason A. Bryant
Kevin K. Bryant
Matthew Brzostowski
Mindy Burke
Adam C. Burstein
Carol L. Butler
Wei-Jun Cai
Rodrigo Calles
Katherine A. Campbell
Cynthia D. Campisano
Sara Carena
Richard W. Carlson
Christopher E. Carr
David A. Carstens
Caroline W. Carter
Rueben M. Castagno
Frank Cataldo
Amy Caulder-Church
Jose M. Cembrano
Ramananda Chakrabarti
Thomas Chapin
Samanta Chardon
Feizhou Chen
Jack M. Childress
Frederick H. Chormann Jr.
Juan M. Chow
Jae Won Chung
David Cieslowski
Ryan Clark
George I. Clinkscales
James C. Cloyd
Larry L. Coats
Phoebe A. Cohen
Albert S. Colman
Jennifer R. Conklin
Barbara C. Cooper
Virginia E. Cooter
Michael E. Corbett
Jane A.J. Cordi
Donald W. Corrick
Edward A. Council III
Gary W. Coutu
Bob J. Creed
Kristopher M. Crist
Alexander L. Croft
Nathan R. Daczko
William J. D'Andrea
John Daverin
Casie Davidson
David R. Davis
John C. Davis
Loren G. Davis
Adam C. Day
Teresa De Diego Forbis
Jason Defibaugh y Chavez
Laura D. De Grey
Christine Lynn Dektor
Toni F. DeMayo
Richard J. Deuerling Jr.
Daniel C. Dobson
John E. Dodds
Thomas C. Doggett
Paul R. Doose
Erin L. Dorn
Natalie Dotson
Joseph D. Drew
Aileen W. Duc
George C. Dunfield
Tamrat Endale
Tina M. Entenman
Vasile Ersek
Abraham David Escalante
Steven Fair
Michael R. Farmer
Noah P. Fay
Sharon V. Felix
David P. Finlayson
Noah Finnegan
Timothy D. Fitzgerald
William K. Flick
Erin Fogarty-Kellis
Russell E. Foote
Eric W. Ford
C.J. Fotheringham
Jane E. Francis
Michaud Francois
Theodore J. Fremd
Wayne T. Froehlich
Edmund L. Frost III
Peter R. Furey
Ferran Garcia-Pichel
Christopher B. Gardner
Philip M. Gardner
Marco Garello
John D. Gartner
Laura M. Gates
Tammie L. Gerke
Daniel Giammar
Dianna M. Gimon
Jake Glascock
Ramon Antonio Gonzalez
Jo-Anne S. Goodwin-Bell
Adam R. Goss
Amber B. Granger
Nicole R. Granger
John K. Green
Ryan R. Green
Jonathan L. Greene
Harrison Griffin
Darren R. Grocke
Gregory A. Gromadzki
Lindsay W. Groom
Guilherme Gualda
Subhash C. Gupta
Brian C. Hahn
Elizabeth Hajek
Tristram C. Hales
Tracy L. Hall
Rolf O. Hallberg
Judy A. Harden
William G. Hargett
Reko G. Hargrave
Jodi N. Harney
Jonas E. Harrell
Jamie S. Harris
Yoshitaka Hashimoto
Derrick P. Hasterok
Samantha Haught
Walter T. Haven
Jodie L. Hayob
Blair Hedges
Rene G. Hefner
Jeffrey A. Heidelberg
Tim Heisler
Stuart D. Hemming
Christopher A. Henderson
Kelly E. Henderson
Marion Henry
Robert W. Henthorne
Kristin Hepper
Carrie L. Herbel
Ellen K. Herman
Heidi P. Hills
Hans J. Hinke
David M. Hirsch
Monique Y. Hobbs
David J. Hoffman
Tammy S. Hoherz
Marla Hood
Robert J. Horton
Beverly M. House
Cathryn A. Hoyt

Shusheng Hu
Amy L. Hudson
Elaina Hurst
Gina M. Hurst
Jens M. Hvid
Kevin D. Hyde
Peter J. Idstein
Michael J. Ingersoll
Rachel A. Ingersoll
Stephen L. Ingram
Martin W. Insley
Christine M. Irwin
Carolina Isaza
Dawn E. James
Gregory A. Janevski
Julie Jean
Joel P. Johnson
Cambrey S. Johnston
Alasdair Jones
Eric Kappus
Gabe Kassos
Michael S. Kearney
Laura L. Keefer
M. Charlene Keen
Karin M. Kelford
David W. Kelley
Gregory S. Kendall
Shelley J. Kenner
John W.F. Ketchum
Caleen E. Kilby
Seung-Sep Kim
Cari J. Kimble
Richard Knight
Kirk E. Kofford
Julide Koracin
Douglas E. Kowalewski
Georgiana Y. Kramer
Vicki J. Kretsinger Grabert
David Kretzing
Yusuke Kubo
Joachim Kuhlemann
Pranav Kumar
Gary Kupp
Joshua Kurek
Takuichiro Kuwabara
Kenneth L. Kvamme
David C. Lampe
Robert W. Lange
Patrisha A. Lappe
Leehee Laronne
Ovidiu R. Lazar
John Le Golvan
Ming-Kuo Lee
Vjollca M. Lekaj
Paul A. Lenaker
Whitney L. LePore
Daniel Lerman
Chuntao Liang
Kathy J. Licht
Kevin J. Lielke
Johnny Liles Jr.
David Linari
Merideth A. Lindeman
Clifford R. Lippitt
Ann D. Long
Regan Long
Stephen Lubbs
Christopher L. Mabbett
Rob D. Mackley
M. Beatrice Magnani
Sarah A. Mahoney
Katrin Mai
Zita Maliga
Matthew R. Manon
Jerry W. Mansfield
Joubert Marc
Rebecca D. Marjerison
Jeffrey H. Marsh
John P. Martin
Christine L. May
Lisa H. Mayo
Amy C. McAdam
Brian P. McCaffrey
Andrew C. McCarthy
Rory McFadden
Ryan D. McKinney
Christine V. McLelland
Brian McNamara
Paul D. McNeill
Melanie L. McPhail
Kristi G. McQuiddy
Jerome D. McSorley
Johnny Merideth
Dorothy M. Metcalf-Lindenburger
Ginger M. Mikulich-Lapsansky
Alisa C. Miller
John F. Miller
Richard E. Miller
Kitty Milliken
Annalee S. Miner
Helena Mitasova
Lloyd W. Mitchell
Stephen J. Mitchell
Ryo Miura
Kristin J. Moran
Jennifer Morgan
Tamara R. Mosley
Irvin Mossberger
Alison S. Mote
Elizabeth T. Moulton
Seth Mueller
Timothy C. Mullin
Keri L. Murch
Jack A. Murphy
Michael J. Murphy
Andrew Muwanga
Daniel J. Myers
David E. Myers
Timothy S. Myers
Jill Nappi
Noah T. Ndenga
Chinwe I. Ndubuka
Majd E. Neameh
Jason C. Neff
Jim Neiss
Laura I. Net
Roseanna M. Neupauer
Margaret C. Neville
Brad Talon Newton
Seth A. Newton
Kristine E. Nielson
Osamu Nishikawa
Stephen K. Nix
Glory E. Nkwelle
Sebastien Nomade
Milos M. Novotny
Hendro Nugroho
Barbara O'Grady
Mariana I. Olariu
Olufemi J. Olubi
Randall Orndorff
Terry L. Oroszi
Mikki Osterloo
Jounada Oueity
Kevin Padian
Sharon L. Palmer
Douglas E. Paquette
Linda L. Parker
William G. Parker
Frederick K. Partey
Laura A. Pastor
Simon A.J. Pattison
Edmund Perfect
Morgan Perrone
Barbara Petrunic
Steven B. Petrushak
J. Cory Pettijohn
Steffi A. Pharo
Kenneth D. Pilgreen
Mario A. Pino
Prokopi S. Pironkov
Krista R. Polley
Donna F. Posey
Alex Prusevich
Sonya L. Punch
Michele Punke
Ernesto Quinones
Kevin A. Racey
Brian W. Ragan
Robert D. Randell
Doug A. Raszewski
Thomas T. Ratermann
Rodrigo Rauld
William G. Reay
Amy L. Rechenmacher
Adria Reimer
Julie B. Retrum
Bernhard M. Riegl
Jennifer L. Ritchie
Ben Roberts
Steven P. Roberts
Robert F. Robinson
Elizabeth A. Roeser
Kimberly G. Rogers
Adam W. Romey
Donald Rosenberry
Ryan N. Rosser
Moutusi Roy
Glenn K. Rubic
Victoria E. Ruiz
William O. Russell III
Frederick A. Rutledge III
Rosanna M. Saindon
Marisa J. Salsig
Roberto Salvati
Fafa Sanyang
Erik M. Sardich
Lynne Saunders
Joerg Schaller
Birgit Scheibner
David R. Schmidt
Jill L. Schneider
Lothar Schrott
Heidi Schutz
Samuel Z. Scott
Stephen Selleck
John T. Shafer
Mark Shapley
Timothy Sharp
David L. Sharrow
Terri Shattuck
Mary K. Sherwood
Wendy Shindle
Erica L. Shipman
Liangshu Shu
Ingvar Atli Sigurdsson
E. Craig Simmons
Ethan S. Skinner
Michael J. Slebodnick
Brian Smerdon
Carol Ann Smith
Diana E. Smith
Daniel F. Snare
Erica M. Snare
Joshua M. Sneideman
Peter J. Sniffen
John L. Snyder
Peter W. Soltys
Lawrence E. Spangler
Cornelia D. Spiegel
Karl Spinks

Kurt A. Spokas
Kevin W. Stafford
Darry Stansbury
Gregory Steele
Matthew J. Steinkamp
Clarence M. Stewart Jr.
Susan E. Stewart
Andrew Stoeckinger
Gary L. Stringer
Deborah Stringham
Joseph K. Stropes
Lisandro Suarez
Alysa N. Suero
Charlene R. Sundermann
Sohini Sur
Anthony M. Swierczek
Kimberly A. Syrowski
Danko Taborosi
Eiichi Tajika
Renee Takesue
Lillian H. Tanguay
Eli Tannenbaum
Lisa G. Taylor
Jessica Terrien
Joya L. Tetreault
M. Ray Thomasson
Richard M. Thompson
Dave A. Thomson
Valerie Thorp
Jian Tian
Tiong-Ee Ting
Gerard Tobin
Corey A. Todd
Eric K. Tonui
John G. Torrence
Marco-Antonio Torres-Vera
Rachel L. Townsend
Marcus A. Trotta
Tony J. Troutman
Tatsuki Tsujimori
Jim Tucker
Rita Tull
Andrew S. Turner
Yoshihiro Uemura
Todd G. Umstot
Sandra Underwood
Jana M. Van Alstine
Bridget M. Van De Kop
Arie J. van der Velden
Rebecca Van Lieshout
Brian Velardo
Nicole Vermillion
Leeni A. Vilpas
Andrew Viscomi
Walter R. Voggenreiter
Peter Voice
K.C. Vorthmann
Ivo Vos
Bridget Wade
Chad Walby
Jens M. Walter
Arianne M. Wames
John J. Warwick
Dawn M. Wellman
Wayne M. Wells II
A. Joshua West
Brian White
Lindsay H. White
Andrea Wickham
Daniel R. Williams
Monica K. Williams
Olivia Williams
Melissa S. Wilmot
Bartholomew D. Wilson
Charlie Kent Wilson
Jennifer B. Wilson
Joanne Wilton
Kerstin M. Witte
Antje Wittenberg
Matthew Wolinsky
Martin Wong
Kaiwen Wu
Chuck R. Wyckoff
Douglas B. Yager
Glenn Yanagi
Keewook Yi
Dawit D. Yifru
Sharon S. Yohn
Kyungsoo Yoo
Yongjun Yue
Natalia Zamora
Gengxin Zhang
Tara C. Zuroweste

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New GSA Associates and Affiliates

The following 302 Affiliates and Student Associates joined GSA between April and October 2002.

Tanya Abela
Chris M. Adams
Heather R. Adams
Babatunde A. Adeyeye
Sunita Agarwal
Michelle R. Akers
Jesse A. Allred
Jennifer Amarante
Jennifer L. Anderson
Steve M. Anderson
Peter A. Aron
Joanne Ballard
Jennifer A. Baptist
Richard J. Barkett
Donald S. Beauvais
Caroline Beller
Scott E.K. Bennett
Adam J. Benthem
Luke Patrick Beranek
Beverly Berekian
Michael C. Besche
Ryan M. Bierma
Michael A. Bill
Terrance R. Birdsall
Cheryle A. Boggs
Stacy Boore
Kim Bosco
Niki Bowerman
Abby L. Bowers
Zack R. Bowles
Kristina L. Brady
Michael R. Breese
Mary Brinkley
Jessica A. Brock
Shane H. Brodie
Kimberly Brosnan
Alyx J. Brun
Jason P. Buck
Steven G. Bundrock
Jennifer L. Burns
Frank R. Burnside III
Lea A. Burris
Brent J. Butler
Melinda S. Buyck
Beth E. Caissie
Jessica Campbell
Nina L. Carranco
Gabriele Casale
Robert Chace
Heather E. Choppin
Michael A. Ciccone
David V. Clark
Tina Anne Clemens
Kristopher M. Clemons
Robert S. Crawford
Jonathan D. Culpepper
Lawrence C. Cusick
John M. Dailey
Kurt Dalman
Joseph R. Davis
Erik M. Day
Amal K. Dey
Vanja Dezelic
Kira Diaz Tushman
Stefanie Dilts
Danny Do
Justin P. Dodd
Crystal L. Dodson
Amalia Doebbert
Angie L. Dolin
Christopher E. Drabandt
Yasue H. Drabble
Michael Dreher
Sharon Maguire DuBois
Jason A. Duncan
Jennifer L. Dunn
Beth Ellen Dushman
Ratna Dutta
Lisa M. Eaton
Douglas A. Edmonds
Elizabeth A. Elias
Catherine M. Ellis
Jennifer L. Esparza
Dave Estes
Joe D. Fabrizio
John Fam
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Elizabeth M. Fein
David R. Fellenz

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Michael L. Fidler Jr.
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Kristin M. Fitzgibbon
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Susan Fletcher
Elizabeth A. Freedman
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Vicki L. Gee
Edgar Gelabert
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Brent M. Goehring
Ryan D. Gold
Lyshia Goodhue
Amber N. Gordon
Candace Grand Pre
Nicholas M. Gregg
Rachel M. Greve
Craig Grimes
Jeff Grizzard
Jordayna J. Gross
Ronald Gyllenhammer
Felicia L. Hall
Rebecca Halley
Jamie L. Hamilton
Rebecca S. Hamilton
Christopher J. Hanley
Lisa Ann Hansen
Lori C. Harris
Samantha J. Harris
Hiroko Haruta
Amanda M. Hassler
Stan C. Hatfield
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Erin Jo Heffron
Arthur D. Hickman
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John D. Horton
John A. Hoskins
Robert Hoverman
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Kim H. Huynh
Ryan B. Ickert
Andrew D. Ingraham
Jason Alan Jackson
Kelly L. Jackson
Meghan L. Jackson
Christy S. Jacobs
Ali R. Jaffri
Michael A. Jahn
Lindsay E. James
Dana L. Janiak
Megan A. Jenkins
Patricia A. Jenkins
Debal C. Kar
Shaddick Keagy
Brian Kelley
Peter Joseph Kelly
Aaron B. Kelts
Andrew R. Kennedy
Megan G. Kennedy
Robin S. Kerley
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Emily Knight
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Piera Lentini
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Amy Luther
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Philip Morath
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Anna M. Morisani
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Andrea Mullen
Emily K. Mullen
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O. Kelly Murphy
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Derrick R. Newkirk
David N. Newman
Jo Newman
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Katherine L. Onstad
Justin E. Ossolinski
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Sheetal Patel
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Julie A. Pecarina
Chris Peppers
Michael J. Perkinpine
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Leigh A. Porter
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Thomas G. Raymann
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Elise K. Reynolds
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Jordan Rund
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Kenneth J. Slatten
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Sarah R. Snyder
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Abby L. Springer
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Robert R. Stahlman
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Gerald L. Swieringa
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Dennis Tasa
Charles Teague Jr.
Jo Ann L. Teas
Sunil Thapar
Stephen P. Thomas
Melanie E. Thompson
Amy M. Thomson
Jacob Throolin
Garrett Timmerman
Charlene M. Todd
Jaime L. Tomlinson
Waneta Trabert
Jeremy J. Treague
Jamey P. Turner IV
Niranjan Upadhayay
Ashley L. Van Dyne
Robert L. Vaughn
Tammy I. Velzy
Harry Vick
Kenneth L. Walker
Juliet Wartman
Karen M. Weber
James W. Weeg
Jon E. Whisler
Nathan Wilkens
Beth Ann Wisely
Andrew B. Wolf
Seth T. Wolfinger
Anthony O. Wright
D. J. Wurglitsh
Melanie C. Young

ANNOUNCEMENTS

Meetings Calendar

2003

May 8–9	Coaltrans Americas 2003 Conference & Exhibition, Miami Florida, USA. Information: www.coaltransconferences.com/show.asp?id=ECK76, Sonia Gomm or Judith Storr, Coaltrans Conferences, London, UK, coaltrans@euromoneyplc.com, +44-20-7779-8945, fax +44-20-7779-8946.
June 9–13	3rd International Conference in Modern Management of Mine Producing, Geology and Environmental Protection—SGEM 2003, Varna city, Bulgaria. Information: Secretariat Bureau, + 359 2 975 31 17, fax +359 2 974 45 39, sgem@stef92.com, sgem@dir.bg, www.stef92.com. (*Abstract deadline: April 15, 2003; registration deadline: May 20, 2003.*)
June 11–13	24th Summer Conference of the Natural Resources Law Center, University of Colorado: Water, Climate and Uncertainty: Implications for Western Water Law, Policy and Management Boulder, Colorado. Information: (tech sessions) Doug Kenney, (303) 492-1296, Douglas.Kenney@Colorado.edu; (registration) Natural Resources Law Center, University of Colorado School of Law, 401 UCB, Boulder, CO 80309-0401, (303) 492-1272, fax 303-492-1297, nrlc@spot.colorado.edu, www.colorado.edu/Law/NRLC/.
October 4–9	American Institute of Professional Geologists' 40th Annual Meeting, Glenwood Springs, Colorado, USA. Information: www.aipg.org.

2004

February 10–12	Second International Symposium on the Dynamics of Fluids in Fractured Rock, Berkeley, California, USA. Information: Boris Faybishenko, Lawrence Berkeley National Laboratory, (510) 486-4852, fax 510-486-5686, bfayb@lbl.gov, www-esd.lbl.gov/fluidsinrock. *(Abstracts deadline: August 30, 2003.)*
December 5–8	24th Annual GCSSEPM Foundation Bob F. Perkins Research Conference—Salt-Sediment Interactions and Hydrocarbon Prospectivity: Concepts, Applications, and Case Studies for the 21st Century, Houston, Texas, USA. Information: Paul J. Post, paul.post@mms.gov, (504) 736-2954, fax 504-736-2905, www.gcssepm.org. *(Abstracts deadline: August 1, 2003.)*

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

New Directions: Bridging Science and Society

"New Directions in the Earth Sciences and the Humanities," an ongoing investigation into the nature of interdisciplinary research, was launched in the spring of 2001 with a $15,000 grant from the Colorado School of Mines. Now a project of the Center for Science and Technology Policy Research at the Cooperative Institute for Research in Environmental Sciences (CIRES) at the University of Colorado, the hypothesis guiding New Directions is that the disciplines making up the humanities are a largely untapped resource for helping the earth sciences relate more effectively to the rest of society.

In its first year and a half, New Directions has attracted support from a broad range of agencies: the National Science Foundation, the National Aeronautics and Space Administration, the U.S. Geological Survey, the Environmental Protection Agency, the National Endowment for the Humanities, the National Center for Atmospheric Research, and the Geological Survey of Canada. It has also gained backing from ten universities interested in the thesis and goals of New Directions, and a European collaborator.

Today's environmental challenges are as much humanistic as they are scientific and technological in nature. Whether the question is global climate change or a local project of ecological restoration, there are ethical, political, aesthetic, and religious values woven into the insights of science and engineering. Society needs a sustained cultural conversation across academia, and between academia and the public and private sectors, that bridges these domains and interests. Through New Directions, physical scientists, social scientists, and humanists work together with public agencies, private firms, and communities to deepen our understanding of and develop effective responses to environmental problems.

To learn about the goals of New Directions and the progress it has made, such as funding a set of collaborative case studies and running a series of workshops, visit http://newdirections.colorado.edu.

Volunteer Geologists Needed for Philmont Scout Ranch

Here's your chance to stay at an old mining camp this summer in the southern Sangre de Cristo Mountains and talk about geology to backpackers. Geology volunteers spend one or two weeks in the backcountry at the famous Philmont Scout Ranch south of Cimarron, New Mexico. Spouses welcome (sorry, no children). Contact Ed Warner at (720) 904-0560, or ewarn@ix.Netcom.com.

In Memoriam

Alice S. Allen
Woodbridge, Virginia

Yaacov K. Bentor
La Jolla, California
October 29, 2002

William A. Braddock
Boulder, Colorado

F. Eyolf Bronner
Durham, North Carolina
January 31, 2003

Donald M. Brown
Bella Vista, Arkansas
November 6, 2002

P.G. Cooray
Hindagala, Sri Lanka
January 4, 2003

Jesse L. Craft
Bethel Park, Pennsylvania
December 17, 2002

Jose M. Fuster
Madrid, Spain

Lewis H. King
Dartmouth, Nova Scotia, Canada
February 7, 2003

William A. Kneller
Sylvania, Ohio
September 13, 2002

Rudolph W. Kopf
Grass Valley, California
December 2, 2002

Ben E. Lofgren
Sacramento, California
August 12, 2002

Takashi Miyano
Ibaraki, Japan
October 21, 2002

Kiguma J. Murata
Sacramento, California

John A. Reinemund
Myrtle Beach, South Carolina
December 8, 2002

Frank A. Swenson
Fort Collins, Colorado
September, 2002

Arthur N. Strahler
Cambridge, Massachusetts
December 6, 2002

Donald E. White
Portola Valley, California
November 20, 2002

Richard Daniel White
Corpus Christi, Texas

Leonard W. Wilmarth
Fawnskin, California
November 19, 2002

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

NSF, *Science* Announce Science Visualization Contest

The National Science Foundation and the journal *Science* are accepting entries for the inaugural 2003 Science and Engineering Visualization Challenge. Winning selections will be featured in a special section of the September 12 edition of *Science*, and winners will receive an expense-paid trip to the foundation for its "Art of Science Project" exhibit and accompanying lecture.

This new international contest will recognize outstanding achievement by scientists, engineers, and visual information practitioners in the use of visual media to promote understanding of research results. The contest is open to individual scientists, engineers, visual information practitioners, and scientific teams—including technicians and support team members—who produce or commission photographs, illustrations, animations, interactive media, video sequences or computer graphics for research.

Entries must have been produced after January 1, 2000. Contest deadline for postmarked entries is May 31, 2003.

See www.nsf.gov/od/lpa/events/sevc for rules and entry instructions.

Call for Nominations:

Twelfth Annual BIGGS AWARD

for Excellence in Earth Science Teaching for Beginning Professors

The Biggs Award was established by GSA to reward and encourage teaching excellence in beginning professors of earth science at the college level.

Eligibility

Earth science instructors and faculty from all academic institutions engaged in undergraduate education who have been teaching full-time for 10 years or fewer. (Part-time teaching is not counted in the 10 years.)

Award Amount

An award of $750 is made possible as a result of support from the Donald and Carolyn Biggs Fund (maintained by the GSA Foundation), the GSA Geoscience Education Division, and GSA's Education and Outreach Programs. This award also includes up to $500 in travel funds to attend the award presentation at the GSA annual meeting.

Deadline & Nomination Information

Nomination forms for the 2003 Biggs Earth Science Teaching Award are posted at www.geosociety.org (go to "Grants, Awards & Medals," then "GSA Awards"). Or, contact Program Officer, Grants, Awards & Medals (303) 357-1037, awards@geosociety.org. Nominations must be received by May 1, 2003.

Mail nomination packets to:

Program Officer, Grants, Awards, and Medals
GSA, P.O. Box 9140
3300 Penrose Place
Boulder, CO 80301-9140

Thank You For Your Input!

Fall 2002 Member Surveys Help Shape GSA Meetings

Ann Cairns, *GSA Director of Communications*

Last fall, GSA conducted two Web-based surveys on the subject of meetings. Members and nonmember meeting attendees provided a wealth of information considered by GSA's Annual Program Committee (APC) at its meeting in Boulder in February 2003. GSA staff and APC would like to thank everyone who took the time to respond with thoughts, opinions, and questions!

The first survey, conducted in October 2002, explored possible sites for future GSA annual meetings. A live link to the survey was e-mailed to members and nonmembers who attended annual meetings in 2000 and 2001, as well as to all those preregistered for Denver 2002. The second survey, conducted in November 2002, solicited feedback on the Denver meeting from all attendees.

The responses received prompted the following list of frequently asked questions as a means of sharing some survey highlights.

GSA MEETINGS

FAQs

"ARE WE GOING TO CONTINUE MEETING IN DENVER AT FREQUENT INTERVALS?"

Yes. A vast majority of respondents are happy with meeting in Denver at regular intervals. The present rotation pattern allows us to negotiate lower rates with the Denver Convention Center and downtown hotels.

"WHY DON'T WE MEET IN SOME DIFFERENT, LESS COSTLY CITIES?"

Only a limited number of U.S. cities have convention facilities large enough to accommodate the GSA annual meeting. While we're presently constrained by that fact, we do monitor and keep in touch with other cities that are expanding their facilities. As soon as they can handle us, we're prepared to add them into the mix. It may take a while because of the long lead-times involved; we routinely book facilities 8–10 years in advance. In the meantime, we rotate among cities that give us variety and keep field trips and other meeting activities fresh. We also try to avoid meeting too often in high hotel-cost cities.

"WHY ARE GSA MEETING COSTS HIGHER THAN THOSE OF SOME OTHER SOCIETIES?"

As someone once observed, life is a series of tradeoffs. Some societies choose to meet every year in the same location; through long-term contracts they are able to negotiate excellent rates with the convention center and city hotels. Others have extensive corporate participation in their meetings. GSA uses both of these cost management strategies to some extent, while giving attendees the location and field trip variety they value.

"WHAT DOES THE REGISTRATION FEE COVER?"

Professional-level registration at GSA's annual meeting provides access to the technical program (approximately 3,300 oral and poster presentations), Exhibit Hall, welcoming party (plus tickets for two free drinks), the Internet Access Center, and the Graduate School Information Forum. At the same time, the registration fee helps to cover many expenses. These include: convention center rental, cancellation insurance, permits, and on-site paramedics; registration counters, poster boards, and signage; audiovisual equipment; program book; GSA staff expenses; subsidy of student-level registration; and the April and June issues of *GSA Today*. Annual meeting revenue also helps support GSA as a whole throughout the year.

"ARE WE GOING TO CONTINUE THE SUNDAY-THROUGH-WEDNESDAY TECHNICAL SESSION FORMAT?"

Yes. Feedback from Denver 2002 was strongly positive. Saturday stay-overs help attendees keep travel costs down. Sunday-through-Wednesday also shortens the amount of classroom time missed by academic professionals. Exhibitors at Denver 2002 indicated they'd like to close a little earlier on Wednesday, so we're going to incorporate that change this year in Seattle.

"CAN'T WE AVOID SCHEDULING CONCURRENT SESSIONS IN THE SAME FIELD OF INTEREST?"

An enormous amount of effort each year goes into avoidance of schedule conflicts. The technical program chair and other members of the Joint Technical Program Committee review all the sessions, consider input received from divisions, associated societies, and others, and do their best to put together a final program that minimizes conflicts. Given the size of the technical program, it's impossible to avoid them completely.

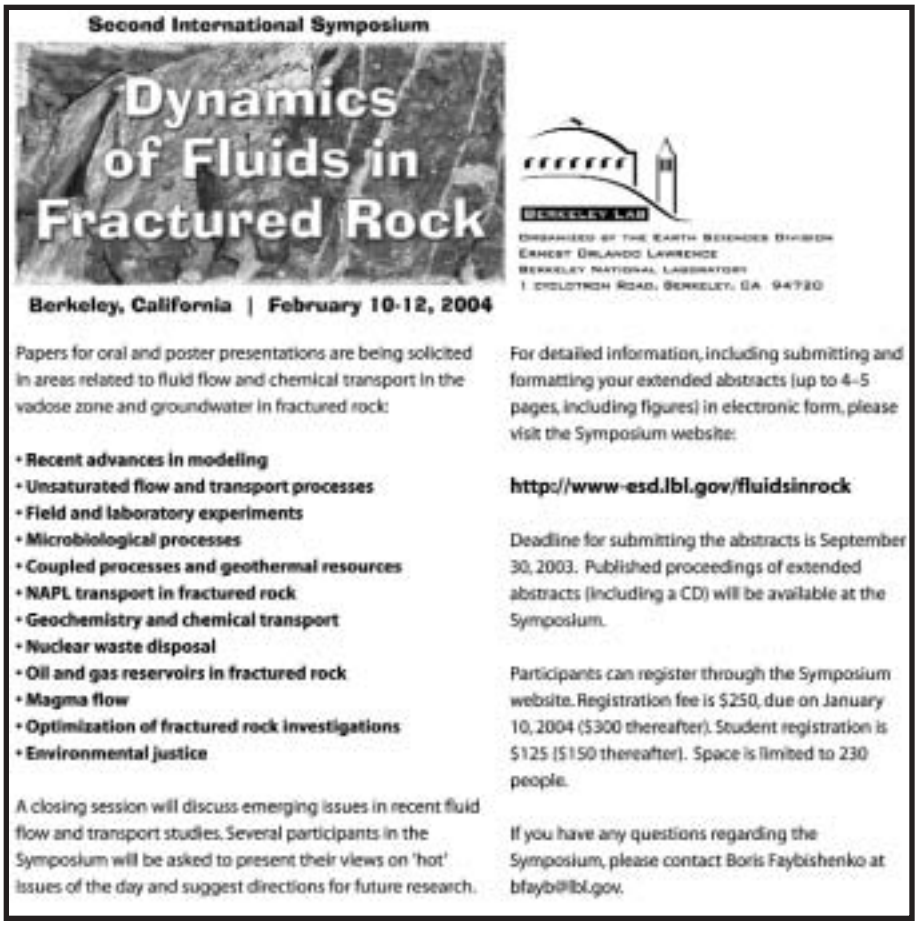
E&EG Call for Papers

Environmental & Engineering Geoscience (E&EG), a quarterly journal copublished by GSA and the Association of Engineering Geologists, publishes peer-reviewed contributions, based on original work, in the broadly defined areas of environmental and engineering geosciences (including geomorphology, hydrogeology, low-temperature geochemistry, neotectonics, and other earth surface processes). Both theoretical and empirical contributions related to these areas are welcome, although preference will be given to papers of an applied nature. *E&EG* encourages the submission of the following kinds of papers.

- Results of original research in the environmental and engineering geosciences.
- Case histories describing the solution of new or unusually difficult problems in the applied geosciences.
- Review papers that summarize the state of the science or professional practice in a branch of the applied geosciences, including contributions describing relevant aspects of local or regional geology or the history of environmental and engineering geosciences.
- Short technical notes (six published pages or less) describing new techniques, novel case histories or other topics in the environmental and engineering geosciences.
- Brief critical discussions of papers and technical notes published in E&EG.

Submit six copies of manuscripts for review to:
Abdul Shakoor, Co-Editor
Environmental & Engineering Geoscience
Department of Geology
Kent State University
Kent, OH 44242

All text, captions, tables, and references should be double spaced and printed on one side of the paper only. Good quality copies of illustrations should be sent until the originals are requested. Charges for color figures are $450 per page. Each author receives 25 free offprints of the published paper.



For more information, contact Shakoor (330) 672-2968, ashakoor@kent.edu, or Co-Editor Alan Fryar, (859) 257-4392, afryar1@uky.edu.

FEBRUARY *E&EG* A "SPECIAL ISSUE"

Special Issue Editor Richard E. Jackson has complied seven papers plus an introduction in "The Effect of Heterogeneities on the Characterization and Remediation of Alluvial Geosystems," in the February issue (vol. IX, no. 1) of *Environmental & Engineering Geoscience.* The special issue focuses on focus on groundwater contamination by dense non-aqueous phase liquids, and includes topics such as chemical oxidation, steam flooding, air sparging, and recent advances in vadose-zone characterization.

MAY (VOL. IX, NO. 2) *E&EG* HIGHLIGHTS

- Weathering and compressive strength of sandstones
- Methane degassing from reservoirs and lakes
- Debris flows in British Columbia

GSA Members can order *Environmental & Engineering Geoscience* online at

www.geosociety.org

(go to "Publications Services," then "How to order publications.")

or

by contacting

GSA Sales and Service
888-443-4472,
gsaservice@geosociety.org.

GSA Foundation Update

Donna L. Russell, *Director of Operations*

Support for GSA Programs

Through the generous support of the GSA membership, the Foundation has provided funding for many GSA programs, including:

- GeoCorps America interns
- GSA Public Service Award
- Earth Science Week
- Geoindicators Conference
- Roy J. Shlemon Mentor Program
- Geology in Government Luncheon
- GSA Annual Meeting
- Subaru Distinguished Earth Science Educator
- Matching Student Travel Grants for the Sections
- Research Grants
- The Bridge Internship Program
- Penrose Conferences
- Field Forums
- International Travel Grants

You can continue to help provide the critical support for these and other programs with your contribution to GSA Foundation on the coupon accompanying this article. You may also donate online through the Foundation's secure site. Go to www.geosociety.org/gsaf/ and follow the directions. A gift of $250 or more will add your name to the Penrose Circle Roster.

Trustee Update

Two members of the Foundation Board of Trustees have been recognized for their contributions to science and society.

Roy J. Shlemon was named an Honorary Member of the American Institute of Professional Geologists at its 2002 Annual Meeting in Reno, Nevada. In addition to being a very active member of AIPG and GSA, Shlemon is a philanthropist and a well-known and highly regarded consultant in soil stratigraphy. He has published the results from some of his jobs for the geoscience community and has also produced a 16-hour video on the Quaternary geology of the San Onofre Nuclear Plant near San Clemente, California. The Shlemon Mentor Program, held during GSA Section meetings, is highly popular with the students.

Farouk El-Baz, research professor and founding director of the Center for Remote Sensing at Boston University, was elected to the National Academy of Engineering. Membership in the academy honors engineers and other professionals who have made important contributions to engineering theory and practice, or have shown unusual accomplishment in the pioneering of new and developing fields of technology. El-Baz pioneered methods of discovering subsurface freshwater from space observations and selected landing sites for the Apollo missions. He established the Farouk El-Baz Award Fund in the GSA Foundation, which rewards outstanding work by earth scientists in desert geomorphology.

A Very Special Thank You

On behalf of the GSA Foundation's Board of Trustees I extend sincere appreciation to the more than 4,800 donors who gave so generously this past year. Your continued support of the Foundation and GSA's programs is critical, and necessary to the geosciences. Thank you once again!

Most memorable early geologic experience

Stepping off of the ice in Antarctica with Admiral Byrd in 1947.

—Alan F. Thomson

GSA Foundation

3300 Penrose Place, P.O. Box 9140
Boulder, CO 80301-9140 • (303) 357-1054
drussell@geosociety.org

Enclosed is my contribution in the amount of $_____.

Please credit my contribution for the:

☐ Greatest need ☐ Other: _____ Fund

☐ I have named GSA Foundation in my will.

PLEASE PRINT

Name _____

Address _____

City/State/ZIP _____

Phone _____

GeoVentures

For complete information on the following events, visit www.geosociety.org (go to "Meetings and Excursions" then to "GeoVentures"), or contact Edna Collis, (303) 357-1034, ecollis@geosociety.org.

Diving on the Great Barrer Reef. Photo by Geoscience Australia.

NEW!

GeoTrip

The Great Barrier Reef in Time and Space

November 15–28, 2003
Townsville, Far North Queensland, Australia
Leader: Robert Burns, Co-Director, Mid-Ocean Marine Sciences, Townsville, Australia. Burns has developed and implemented marine science research programs in conjunction with internationally recognized institutions such as the Smithsonian Tropical Research Institute and the United Nations Intergovernmental Oceanographic Commission (UNESCO IOC).
Description: This GeoTrip's 14-day land and shipboard discovery and adventure itinerary celebrates the incredible biodiversity of the largest, most complex, and biologically diverse marine ecosystem on Earth. The program illustrates how Australia's Great Barrier Reef has responded and continues to respond over geological time to changing environmental conditions with a dramatic reef cruise and a visit to the Outback Fossil Reefs located in the monsoon savanna of North Queensland.

The program is based in the Historic "Federation" era port city of Townsville, which allows participants ample opportunities to experience the unique character of regional Australia. After a few days in Sydney experiencing wildlife, indigenous culture, and the wonderful Sydney harbor, participants will head for Townsville by air. They will visit Kelso Reef to snorkel or scuba dive, if certified, on the Great Barrier Reef and Magnetic Island, where participants will go on a kayak tour. Participants will also visit a 200 million-year-old reef near the inland gold rush town of Charters Towers. More island visits occur at the end of the trip by way of high-speed catamaran.

In addition to scientific tours with local specialists, participants have time to explore the local towns or just relax on one of the beaches.

Habitats visited include outer, platform, and fringe reefs; estuarine systems of the Hinchinbrook Channel; World Heritage rainforests of the wet tropics; monsoonal savannas; the Nulla Volcanic Province of Tropical North Queensland.
Fees and Payment: $3,800 for GSA members; $3,995 for nonmembers. A deposit of $500 is due with your registration and is refundable through July 1, less an administration fee of $225. Total balance is due July 31. *Firm* minimum: 13; maximum: 20. **Included:** Lodging based on double occupancy, most breakfasts, some lunches, two dinners, land transport in Australia, notes. **Not included:** Airfares (Los Angeles–Sydney or Sydney–Townsville return); alcoholic beverages, and other expenses not specifically included.

Reminders

More information on the following events was published in the February 2003 and December 2002 issues of *GSA Today.* See also www.geosociety.org. Go to "Meetings and Excursions," then to "GeoVentures."

GeoTrip (Price reduced!)

Basalts, 'Beests, and Bee-Eaters: The Geologic and Natural History of the Kenya Rift and Environs, Kenya and Northern Tanzania GeoTrip

July 30–August 14, 2003
Co-Leaders: Timothy F. Lawton, New Mexico State University, Las Cruces, and **Brenda J. Buck,** University of Nevada, Las Vegas
Description: This GeoTrip to the Kenya rift explores the geologic and natural history of this unique tectonic province and its associated spectacular environments, supporting a variety of bird and wildlife habitats. Participants will have the opportunity to hike and view ice-sculpted landscapes on glaciated Mount Kenya, Kenya's highest peak, situated squarely on the equator; visit saline internally drained lakes in the rift itself; boat immense Lake Victoria; traverse the Precambrian shield on the north edge of the Serengeti Plains; explore the spectacular Ngorongoro Crater, an intra-rift caldera; visit Olduvai Gorge, the cradle of humankind; and ponder the great Kilimanjaro.
Fees and Payment: $5,150 for GSA members; $5,400 for nonmembers. A $500 deposit is due with your reservation and is refundable (less $300 cancellation fee) through June 1. Balance is due June 1. Fee is based on double occupancy. Single supplement, based on availability, is an additional $895. Minimum number of participants *(firm)*: 15; maximum: 40. **Included:** Accommodations in twin bedded rooms; all meals on tour beginning August 1; flights within East Africa; guidebook; all tips and gratuities to drivers/guides, hotel, and camp staff; temporary membership in the Flying Doctors Service; government taxes and levies. **Not included:** Airfare to Nairobi and return from Tanzania; optional

tours; lunch in Nairobi on August 9; entry visa fees to Kenya and Tanzania (approx. $100); alcoholic beverages; and other expenses not specifically included.

GeoTrip

Costa Rica: A Student-Only Oriented GeoTrip

July 31–August 15, 2003
San José, Costa Rica
Scientific leader: James Reynolds, Brevard College, Brevard, North Carolina.
Description: Restricted to students, this trip will visit the classical geological localities of Costa Rica on a journey rivaling any adventure tourism excursion. Costa Rica offers a rich variety of national parks and nature preserves upon which most of our trip will focus. Participants will stay in quality hotels and eat excellent Costa Rican cuisine. Approximately 50 km of hikes will take us through spectacular volcanic highlands, tropical rain forests, and coastlines. The extreme changes in elevation on the volcanic slopes will allow us to visit all of the major ecological zones, seeing their plants, mammals, birds, and reptiles. Students will be able to receive transfer course credit.
Fees and Payment: $2,900 for GSA student members; $3,000 for non-members. A $450 deposit is due with your reservation and is refundable (less $225) through May 1. Total balance is due May 1. *Firm* minimum: 16; maximum: 35. Included: Lodging, based on double occupancy; 15 breakfasts, 11 lunches, 11 dinners; field trip transportation; tents for camping nights; and guidebook and map. Not included: Airfare to and from San José, Costa Rica; sleeping bags and pads; alcoholic beverages; and other expenses not specifically included.

GeoClass

Tilted Rocks, Mountain Roots, and Ancient Oceans: A Newcomer's Guide to the Geology of the Front Range

June 27–30, 2003
Williams Village Dormitory
University of Colorado, Boulder
Scientific leader: Alan Lester, University of Colorado, Boulder.
Description: In this GeoClass, a combination of lectures, discussions, and field excursions will be used to reconstruct the rich and complex—nearly two billion year—geologic story of this unique region. We'll encounter a wide variety of rock types (metamorphic, intrusive, volcanic, sedimentary), observe a range of geologic structures and erosional features, and become familiar with local stratigraphy.
Fees and Payment: $525 for GSA members; $600 for nonmembers. A $200 deposit is due with your reservation and is refundable through May 1, less a $20 processing fee. Total balance is due May 1. Minimum: 12; maximum: 22. **Included:** Classroom programs and materials; field trip transportation; lodging for three nights (single occupancy or doubles for couples in dormitory style rooms, shared bath); breakfast on Saturday, Sunday, and Monday; boxed lunch on Saturday and Sunday; and welcoming and farewell events. **Not included:** Transportation to and from Boulder, Colorado; transportation during hours outside field trips; alcoholic beverages; and other expenses not specifically included.

GeoHostel:

Geology of the Southern Wind River Range and Wind River Basin, Wyoming

SOLD OUT!

July 12–17, 2003
Pronghorn Inn
Lander, Wyoming

GeoVenture participants must be 18 or older and in good health. Any physical condition requiring special attention, diet, or treatment must be reported in writing when reservations are made. We'll do our best to accommodate special needs, including dietary requirements and physical disabilities. Deposits and payments are refundable less a processing fee, up to the cutoff date. Termination by an individual during a trip in progress for any reason will not result in a refund, and no refund will be made for unused parts of trips. **Registrants with Special Needs:** GSA is committed to making GeoTrips accessible to all. If you require special arrangements or have special dietary concerns, please contact Edna Collis, ecollis@geosociety.org.

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Keith Howard at Kilauea Volcano.

Gerry Ross at Mount Sibbald in the northern Purcells Mountains of British Columbia.

New Science Co-Editors Take the Reins of *GSA Today*

Karl Karlstrom of the University of New Mexico has completed his term as *GSA Today* science editor after serving two years as co-editor with Molly Miller (Vanderbilt University) and another year tackling the job solo. Sincere thanks go to Karl for his unwavering dedication to *GSA Today*.

Keith Howard of the U.S. Geological Survey, Menlo Park, and Gerry Ross of the Geological Survey of Canada, Calgary, have been appointed the science co-editors for *GSA Today*.

"We are pleased and honored to work with GSA to continue the excellence of *GSA Today* as a venue for dissemination of timely and topical scientific articles to the broad GSA audience," wrote Keith and Gerry. "Karl Karlstrom set a high standard during his tenure as the *GSA Today* science editor (single handedly for the last year or so!!). The science articles are popular among students and professionals and commonly receive the most 'hits' at GSA's online publication page. It is our shared goal to continue to bring you high-quality research articles of broad interest that reflect the wide diversity of scientists in our field. We invite suggestions and ideas for future articles from the GSA community."

Gerry is a geologic generalist who has worked extensively in the Precambrian geology of western Canada with interests and study areas that have included deep seismic crustal structure and tectonics of the crystalline basement in western Canada, bedrock geology and structure of the eastern Canadian Cordillera, the provenance evolution of the Cordilleran foreland wedge, and the stratigraphy and geochemistry of Neoproterozoic sedimentary rocks of the Windermere Supergroup. Through his involvement in the Earth System Evolution Program of the Canadian Institute for Advanced Research he has been exposed to a wide variety of novel research areas and science. For the past 15 years he has worked as a research scientist at the Geological Survey of Canada in Calgary and served as an adjunct faculty member at the University of Calgary.

Keith's diverse career as a research geologist with the U.S. Geological Survey has addressed tectonics and nappes, surface processes, planetology, rock avalanches, climate, plutonism, impact structures, lava dams, hydrogeology, erosion rates, calderas, dike intrusion, mineral resources, waste disposal, and crustal structure. He was elected a Fellow of GSA in 1972, and was a Fulbright Scholar in 1988. He has extensive field experience in the U.S. Cordillera and has also worked in Greece, Galapagos, Scotland, Hawaii, and the Andes. His current interests include evolution of the Colorado River, volcanology, unroofing of the Pyrenees, and extensional tectonics in Nevada and the Southwest.

Editors Complete Terms

Allen Glazner of the University of North Carolina completed his four-year term as *GSA Bulletin* science editor at the end of 2002. A GSA member since 1982 and a Fellow since 1990, he previously served two terms as an associate editor for the journal. Allen's term coincided with a major change in the management of *Bulletin*: the move to online submission and publication. With Allen's help, *Bulletin* transitioned from a paper-based process to using an online manuscript submission and tracking system, which includes sending papers for review via the Web and results in electronic as well as print publication of the journal.

Dave Lageson of Montana State University also completed his term as editor of the Field Guide series in 2002 after serving for four years. Under Dave's leadership, the series produced guides for the Denver 1999, Reno 2000, and Denver 2002 meetings, with the guides also transitioning to online publication.

GSA sends its sincere thanks to you, Allen and Dave, for your contributions to and support of GSA publications.

GSA Science Editors

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POSTDOC IN MATH AND SCIENCE EDUCATION RESEARCH

Applications are invited for a postdoctoral position as part of COSMOS, a regional Center of Excellence in Math and Science Education, a collaborative effort of university faculty, in-service teachers, pre-service teachers, and business and community partners (http://cosmos.bgsu.edu). Our goals include enhanced recruitment, preparation, and retention of math and science teachers, and improved collaboration of all those involved. We seek a postdoc who will participate in a variety of Center activities, including working with education and content faculty on course modifications, conducting discipline-specific action research, or developing contextual learning experiences with business and community partners. The postdoc would reside in the department of interest and would be expected to carry out research in math or science education in that area.

Candidates must hold a PhD in math or natural science. The initial appointment is for one year, renewable for a second year. The starting date is negotiable. Applicants should send curriculum vitae and a description of experience and goals in both teaching and research, and should arrange to have three original letters of recommendation submitted directly on their behalf to: Dr. Barbara Moses, COSMOS, 443 Math Science Bldg., Bowling Green State University, Bowling Green, OH 43403. Completed applications received by May 31 will receive full consideration. AAE/EOE.

ASSISTANT PROFESSOR THE UNIVERSITY OF SOUTHERN MISSISSIPPI

The Department of Geology at The University of Southern Mississippi invites applications for an anticipated tenure-track, nine-month appointment at the assistant professor level beginning August 2003. Minimum qualifications: Ph.D. in geology or a closely related discipline such as geophysics or geological remote sensing; evidence of ability to teach effectively and to conduct quality research. Preferred qualifications: Expertise that strengthens our existing focus areas in environmental geology or marine and coastal geology.

Completed applications received by April 21, 2003, will receive full consideration. A complete application will consist of a vita, a statement about teaching and research goals, an academic transcript, and names of three references. Send applications to Dr. Gail Russell, Chair, Department of Geology, Box 5044, The University of Southern Mississippi, Hattiesburg, MS 39406.

The University of Southern Mississippi is an AA/EEO/ADA employer and encourages applications from females and minorities.

DIRECTOR, GEOLOGY MUSEUM UNIVERSITY OF WISCONSIN—MADISON

The Department of Geology and Geophysics, University of Wisconsin—Madison, is inviting applications for the position of Museum Director. Responsibilities include overseeing the museum's collections and operations, supervising and participating in various outreach functions, and leading the museum's fundraising activities. Responsibilities also include teaching one course each semester.

A Ph.D. in the natural sciences, two years of museum experience and one year of teaching experience are required. Minimum salary: $40,000. Position available date: January 1, 2004.

Application deadline: April 15, 2003.

Applicants should submit a statement of interests, resume, and three letters of recommendation to: Dana Geary, Chair, Museum Director Search Committee, 473 Weeks Hall, 1215 W. Dayton Street, Madison, WI 53706-1692.

UW-Madison is an equal opportunity/affirmative action employer and encourages applications from women and minorities. Unless confidentiality is requested in writing, information regarding applicants must be released upon request. Finalists cannot be guaranteed confidentiality.

NOTE: See www.geology.wisc.edu for additional information about the museum and the department.

FACULTY SEARCH IN EARTH AND ATMOSPHERIC SCIENCES CORNELL UNIVERSITY

The newly expanded Department of Earth and Atmospheric Sciences at Cornell University invites applications for a tenure-track faculty position. The Assistant Professor level is preferred, but consideration will be given to outstanding candidates at the Associate or Full Professor level. Potential for leadership in research and excellence in teaching are requirements.

We seek candidates that can develop highly innovative research and teaching programs in the geophysical or geological sciences that will add to or complement ongoing solid-earth research activities in the department. Additional assets of the potential candidate would be the willingness to interact with the department's programs in atmospheric, upper atmospheric, and/or ocean sciences and with Cornell's programs in computer and information science, material sciences, planetary sciences, and/or biology.

A curriculum vitae including a list of publications, a description of current and future research interests, a summary of teaching experiences and philosophy, and names of three references should be sent to Prof. Bryan L. Isacks, Chair, Department of Earth and Atmospheric Sciences, Cornell University, Ithaca, NY 14853.

Review of candidates began March 1, 2003 and will continue until the position is filled. Cornell is an Equal Opportunity/Affirmative Action Employer and particularly encourages applications from women and under-represented minorities.

EARTH SCIENCE TEACHER PROFESSIONAL DEVELOPMENT AMERICAN GEOLOGICAL INSTITUTE

The American Geological Institute (AGI) invites applicants for a staff position in K–12 Earth science education. The primary responsibility of the position will be to manage and develop programs and services in support of implementation of AGI's secondary earth science curricula. Current programs include:

Web-based searchable image collections;

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National summer curriculum leadership institutes;

Development of videos of Earth science activities and experiments.

Proposal development in support of AGI education programs.

The successful candidate will have a background in earth science and K–12 earth science teaching, understand science education reform, experience conducting teacher professional development workshops, and a strong background in geoscience education and/or science education (M.S. required; Ph.D. preferred). Some travel required.

Applicants can find information about AGI and its education programs at http://www.agiweb.org.

The position is available immediately. Candidates should be able to start no later than August 1, 2003. Salary is commensurate with experience. Relocation to AGI's Alexandria, VA office would be required. Send letter of interest, resume, three references, and salary requirements no later than May 1, 2003 to: Dr. Michael J. Smith, Director of Education, American Geological Institute, 4220 King Street, Alexandria, VA 22302-1502, (Fax: 703-379-7563), E-mail: msmith@agiweb.org.

The American Geological Institute is a nonprofit federation of 40 geoscientific and professional associations that represent more than 100,000 geologists, geophysicists, and other earth scientists. Founded in 1948, AGI provides information services to geoscientists, serves as a voice of shared interests in our profession, plays a major role in strengthening geoscience education, and strives to increase public awareness of the vital role the geosciences play in mankind's use of resources and interaction with the environment. AGI is an Equal Opportunity Employer.

VISITING FELLOWS AND STUDENTS INSTITUTE FOR ROCK MAGNETISM

Applications are invited for visiting fellowships (regular and student) lasting for up to 10 days during the period from July 1, 2003 through December 31, 2003. Topics for research are open to any field of study involving fine particle magnetism, but preference will be given to projects relating magnetism to geological or environmental studies, or to fundamental physical studies relevant to the magnetism of Earth materials.

A limited number of travel grants of up to $750 are available to cover actual travel costs. No funds are available for per diem expenses. Application forms and information necessary for proposal preparation may be obtained from IRM manager Mike Jackson at the address below, or online at http://www.geo.umn.edu/orgs/irm/irm.html.

Short proposals (two pages, single-spaced text plus two forms and necessary figures and tables) are due by April 30, 2003 for consideration by the IRM's Review and Advisory Committee. Successful applicants will be notified in early June, 2003. Proposals should be sent by e-mail to irm@umn.edu, or by post to: Facilities Manager, Institute for Rock Magnetism, University of Minnesota, 291 Shepherd Laboratories, 100 Union St. SE, Minneapolis, MN 55455 0128.

ASSISTANT PROFESSOR OF GEOLOGY NORTHWEST MISSOURI STATE UNIVERSITY

The successful candidate will have a Ph.D. in Geology, strong communication and interpersonal skills, and a strong commitment to and demonstrated excellence in undergraduate teaching. Knowledge of GIS would be helpful. For more information contact our website at www.nwmissouri.edu/HR/humanres.html or the department website at www.nwmissouri.edu/~geopage. Northwest is an Equal Opportunity Employer.

DEPARTMENT OF GEOLOGY UNIVERSITY OF PUERTO RICO

The Department of Geology at the University of Puerto Rico invites applications for a tenure-track position at the level of assistant professor. The department is looking for candidates with specialties in volcanology and/or remote sensing/tectonics. Skills in GIS are especially welcome. A Ph.D. is required at the time of appointment. Successful candidates are expected to teach and develop undergraduate and graduate courses in their fields of expertise and to have a strong commitment to a student-oriented externally funded research program. For more information, visit our home page at: http://geology.uprm.edu.

Applications, including a curriculum vitae, a statement of research and teaching interests, and the name addresses, telephone numbers and e-mail addresses of three references, should be sent to: Faculty Search Committee, Department of Geology, PO Box 9017, Mayaguez, PR 00681-9017.

Evaluation of applicants began March 2003 and continues until the position is filled. The University of Puerto Rico in Mayaguez is an equal opportunity employer. Women and minorities are especially encouraged to apply.

PALEONTOLOGY/SEDIMENTOLOGY CORNELL COLLEGE

Cornell College, a private undergraduate liberal arts college, invites applications for an anticipated sabbatical replacement appointment in its Department of Geology for 2003–2004. Responsibilities include teaching five courses: Invertebrate Paleontology, Sedimentology and Stratigraphy, Historical Geology, Marine Science, and Paleoecology. Ph.D. or ABD required; college teaching experience preferred. Cornell College has attracted

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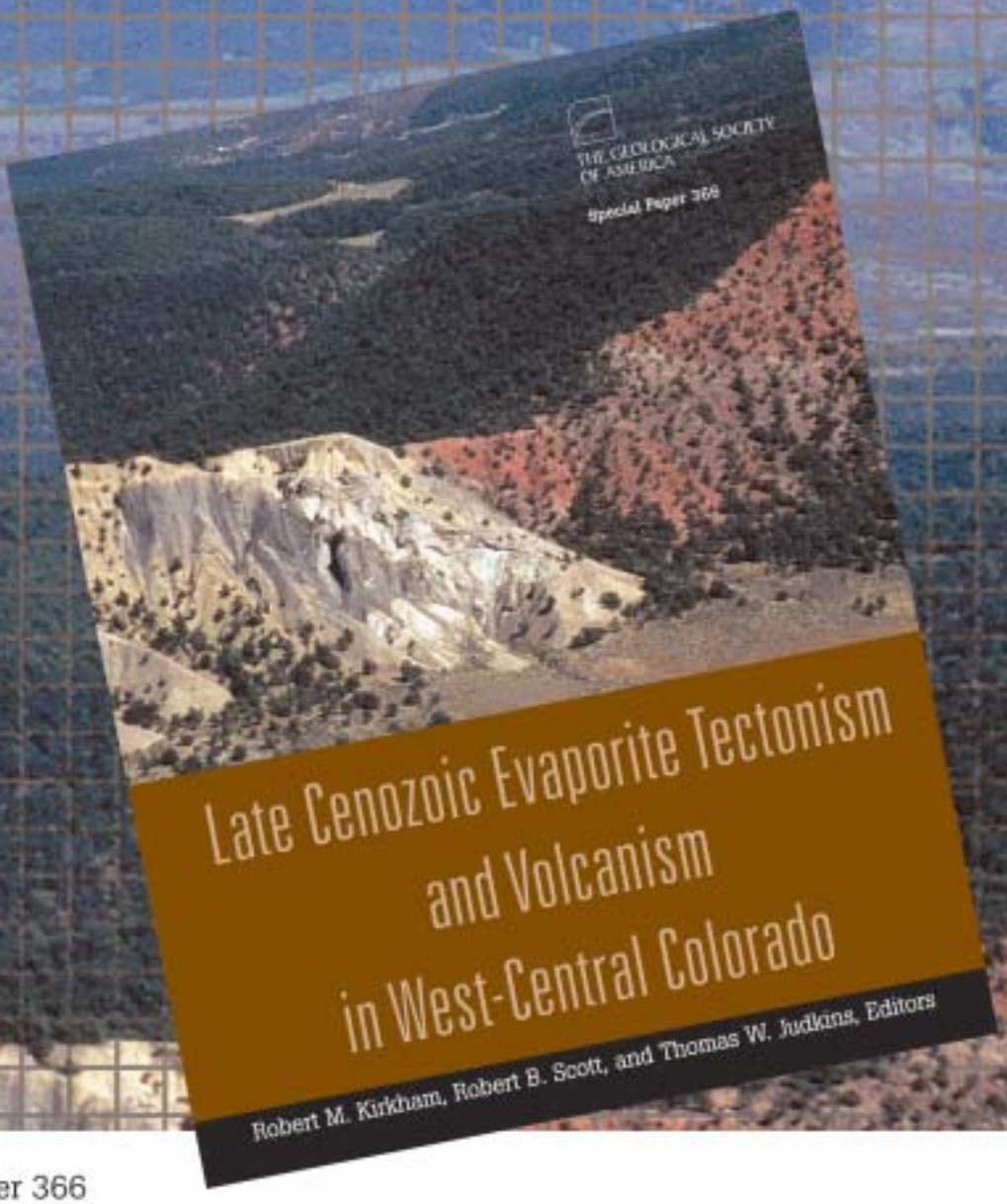

Special Paper 366

Late Cenozoic evaporite tectonism and volcanism in west-central Colorado

Robert M. Kirkham, Robert B. Scott, and Thomas W. Judkins, Editors

Regional late Cenozoic evaporite tectonism has caused widespread collapse in west-central Colorado. Miocene volcanic rocks are downdropped as much as 1200 m in a collapsed area that is at least 3600 km² and possibly more than 5000 km². During the late Cenozoic, rivers removed an estimated 2300 km³ of dissolved evaporite from the contiguous Carbondale and Eagle collapse centers. Collapse was quantified by restoration of deformed Miocene to Quaternary basaltic flows to their pre-collapse position. Late Cenozoic incision rates increased by an order of magnitude during the past 3 m.y., probably triggering or accelerating diapirism and dissolution of evaporite. Annual dissolved solids loads in rivers indicate that removal of evaporite continues at a rate that matches independent geologic estimates.

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national attention for its distinctive academic calendar under which faculty teach and students take one course at a time in month-long terms. The College is committed to excellence in teaching and research and encourages interdisciplinary interests among its faculty. Send a letter of application, curriculum vitae, and three letters of recommendation to: Ms. Ann Opatz, Office of Academic Affairs, Cornell College, 600 First St. West, Mount Vernon, Iowa 52314-1098. Consideration of applications will begin April 15 and will continue until the position is filled. Cornell College is an EO/AA employer. Additional information on the department and Cornell College can be found at www.cornellcollege.edu.

Opportunities for Students

Visiting Fellows and Students. Institute for Rock Magnetism. Applications are invited for visiting fellowships (regular and student) lasting for up to 10 days during the period from July 1, 2003 through December 31, 2003. Topics for research are open to any field of study involving fine particle magnetism, but preference will be given to projects relating magnetism to geological or environmental studies, or to fundamental physical studies relevant to the magnetism of Earth materials.

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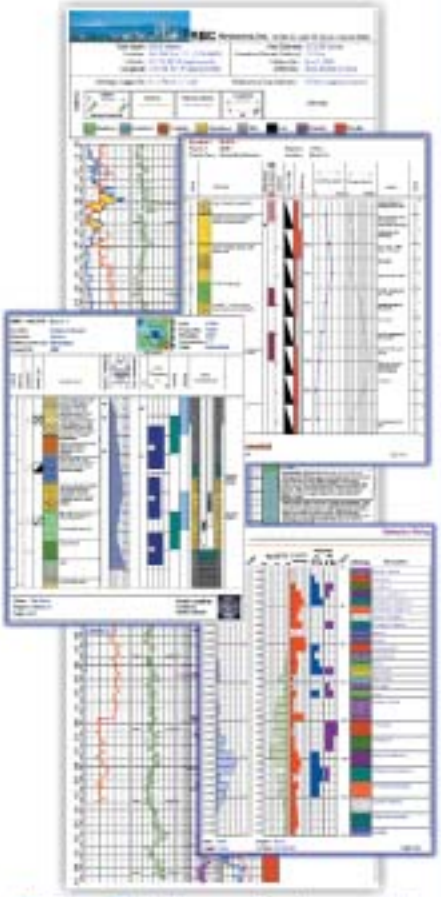

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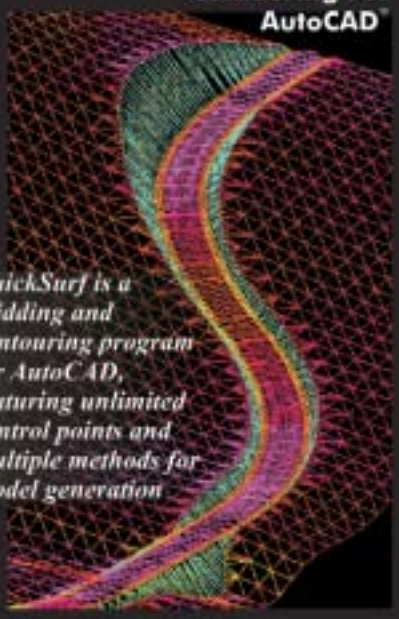

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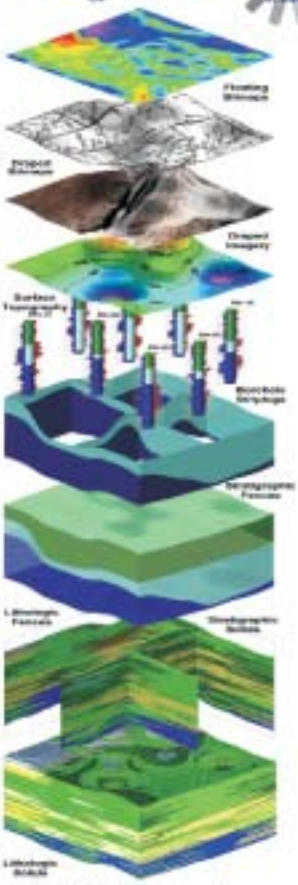

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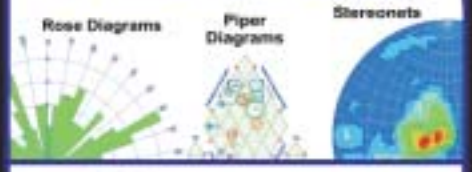

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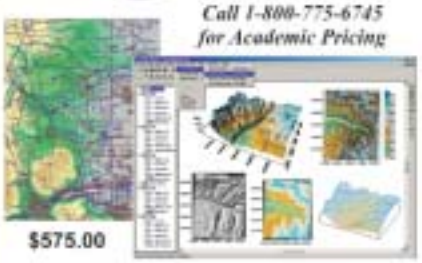

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