CALL FOR PAPERS

GEOSCIENCE in a Changing World

GSA Annual Meeting & Exposition

November 7–10, 2004, Colorado Convention Center, Denver, Colorado

How will our expanding population affect our interactions with the Earth in coming generations? Where will our water come from? Our energy resources? What can we learn about our future on this planet from past environments? How should we be educating our children and our communities about science? How will new technologies push us to ask new scientific questions, and how will our scientific questions drive the development of new technologies? Look through the list of topical sessions and Pardee Symposia for the 2004 Annual Meeting in Denver and you will see these questions intimately interlinked with the science in a wide range of disciplines.

Denver is the perfect setting for a meeting focusing on change. The city has reinvented itself many times, from boomtown of the gold rush days to the cultural center that it is today. Its location at the boundary between the stable craton and the tectonically active west encourages exploration of the forces of change. And, with a geologic history ranging from the Precambrian to the present, there is truly something for everyone.

We are counting on your participation to help make this an exciting meeting. Submit an abstract—to one of the many Topical Sessions, or to an open discipline session—and then encourage your colleagues and students to do the same. At the meeting, plan to wander into a session on a topic outside your own field of expertise, or attend a lunchtime "Hot Topics" session on controversial material. At a time when the geosciences are becoming increasingly multi- and interdisciplinary, the people you meet in other fields may become your next collaborators. Consider participating in one of the many field trips, or expand your horizons at one of the workshops associated with the meeting. Visit what promises to be an outstanding collection of exhibits to find the most up-to-date textbooks and equipment. And, at the end of the day, count on an evening exploring Denver's fine microbreweries and restaurants.

GEOSCIENCE in a Changing World 2004. ***Be there!***

Jane Selverstone
2004 Technical Program Chair

Annual Meeting Sponsor

SUBARU

Title Sponsor of the 2004 GSA Annual Meeting.

2004 Annual Meeting Local Committee

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IMPORTANT DATES, EVENTS, & DEADLINES

Registration Opens:	**June**
Abstracts Deadline:	**July 13**
Early Bird Registration Deadline:	**July 13**
Standard Registration Deadline:	**September 30**
Cancellation Deadline:	**October 7**
Premeeting Field Trips:	**Tues.–Sat., Nov. 2–6**
Short Courses & Workshops:	**Fri. and Sat., Nov. 5–6**
Presidential Address & Awards Ceremony:	**NEW DAY—Sat., Nov. 6, 7–9 p.m.**
Welcoming Party & Exhibits Opening:	**Sun., Nov. 7, 5:30–7:30 p.m.**
Technical Program:	**Sun.–Wed., Nov. 7–11**
Pardee Keynote Symposia:	**Sun.–Wed., Nov. 7–11, 8 a.m.–noon; 1:30–5:30 p.m.**
Private Alumni Receptions:	**Mon., Nov. 8, 5:30 p.m.–1 a.m.**
Group Alumni Reception:	**Mon., Nov. 8, 7–9:30 p.m.**
Exhibit Hall Hours:	**Sun., Nov. 7, 5:30–7:30 p.m. Mon. and Tues., Nov. 8–9, 9 a.m.–5:30 p.m. Wed., Nov. 10, 9 a.m.–2 p.m.**
Hot Topics:	**Nov. 7–10, 12:15–1:15 p.m.**
Postmeeting Field Trips:	**Nov. 10–13**

Photo view of the Soyuz TMA-2 spacecraft docked to the cargo block on the International Space Station. Image courtesy of the crew of ISS Expedition 7, NASA.

THE GEOLOGICAL SOCIETY OF AMERICA

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 Denver GSA Annual Meeting. To reserve space for your event at one of the headquarter hotels or at the convention center, make your plans NOW and complete the Meeting Space Request form online.

Step 1. Start planning NOW.

Step 2. Go to www.geosociety.org.

Step 3. Click on "Meetings and Excursions," then "Geoscience in a Changing World, Denver 2004"

Step 4. Go to the Meeting Space Request Form and complete it online.

Thank you!

GSA Associated Societies

American Association of Stratigraphic Palynologists
American Institute of Professional Geologists
American Quaternary Association
American Rock Mechanics Association
Association for Women Geoscientists
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

GSA 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 Societies

American Quaternary Association ■ American Rock Mechanics Association

PARDEE KEYNOTE SYMPOSIA

INVITED PAPERS

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

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

P1. Early Paleoproterozoic (2.5–2.0 Ga) Events and Rates: Bridging Field Studies and Models

Geochemical Society; Astrobiology Program; GSA Sedimentary Geology Division; SEPM—Society for Sedimentary Geology

Precambrian Geology; Paleoclimatology/Paleoceanography; Tectonics

Andrey Bekker, Geophysical Lab, Carnegie Institution of Washington, Washington, D.C.; Mark E. Barley, The University of Western Australia, Western Australia, Australia; Robert H. Rainbird, Geological Survey of Canada, Ottawa, Ontario

Field-oriented and modeling studies dealing with the 2.5–2.0 Ga Earth's evolution are invited. Session will be focused on relationships between tectonics, change in atmospheric composition, and climatic changes as well as the rates of these changes.

P2. Geoinformatics and the Role of Cyberinfrastructure in Geosciences Research

Geophysics/Tectonophysics/Seismology; Structural Geology; Tectonics

Randy Keller, University of Texas, El Paso, Texas; Lee Allison, Kansas Geological Survey, Lawrence, Kans.

This session consists of presentations on geoinformatics and the use of advanced information technology in support of research in the geosciences. The talks will provide an overview of cyberinfrastructure that is emerging and describe projects that are developing as well as using this cyberinfrastructure.

P3. Geoscientific Aspects of Human and Ecosystem Vulnerability

U.S. National Committee for Geosciences; GSA Critical Issues Caucus; GSA Geology and Public Policy Committee; GSA Geology and Society Division

Public Policy; Environmental Geoscience; Geoscience Information/Communication

Susan W. Kieffer, University of Illinois, Champaign-Urbana, Ill.; Grant Heiken, Los Alamos National Lab, Los Alamos, N.Mex.

Humans and the ecosystems on which they depend are vulnerable to a variety of natural hazards and their mismanagement. This session will explore the response to, and need for, mitigation of large-scale hazards with long time scales.

P4. Medical Geology

GSA Engineering Geology Division

Environmental Geoscience; Geoscience Education; Public Policy

Syed E. Hasan, University of Missouri, Kansas City, Mo.

Many health problems, including cancer, heart, and central nervous system diseases, etc., have links to geologic factors. Experts from geosciences, public policy, and health sciences will discuss new developments in the emerging field of medical geology.

P5. Adversity, Advantages, Opportunities: Phanerozoic Stromatolites as "Survivor" vs. "Disaster" Taxa

Paleontological Society

Paleontology/Paleobotany; Geomicrobiology; Sediments, Carbonates

Constance M. Soja, Colgate University, Hamilton, N.Y.; Robert Riding, University of Cardiff, Cardiff, United Kingdom

This interdisciplinary forum will reexamine the role of stromatolites in Phanerozoic ecosystems, particularly the importance of post-Cryptozoic microbial communities; the biotic and abiotic agents that contributed to their development, decline, and preservation; and their co-evolutionary history with metazoans.

P6. Pre-Mesozoic Impacts: Their Effect on Ocean Geochemistry, Magnetic Polarity, Climate Change, and Organic Evolution

GSA Planetary Geology Division; Paleontological Society

Planetary Geology; Paleontology/Paleobotany; Paleoclimatology/Paleoceanography

Charles A. Sandberg, U.S. Geological Survey, Denver, Colo.; Jared R. Morrow, University of Northern Colorado, Greeley, Colo.; Christian Koeberl, University of Vienna, Vienna, Austria

Pre-Mesozoic comet and meteorite impacts produced extreme oceanic and climate changes, causing mass extinctions followed by rapid radiation of surviving organisms. Thus, they were the driving mechanism in the early evolution of life on Earth.

P7. Seeing Mars with New Eyes: Active Missions, Science Results and Geoscience Education

GSA Planetary Geology Division; Geoscience Education Division

Planetary Geology; Geoscience Education

Eric B. Grosfils, Pomona College, Claremont, Calif.; Susan Sakimoto, NASA/GSFC, Greenbelt, Md.

In 2004, multiple spacecraft are exploring Mars simultaneously. This session will present some of the most recent and exciting science results and demonstrate how the available data can be used to enhance geoscience education activities.

P8. Weathering, Slopes, Climate, and Late-Quaternary Geomorphic Change in Arid and Semi-Arid Landscapes

GSA Quaternary Geology and Geomorphology Division

Quaternary Geology/Geomorphology; Environmental Geoscience; Paleoclimatology/Paleoceanography

Leslie D. McFadden, University of New Mexico, Albuquerque, N.Mex.; Grant A. Meyer, University of New Mexico, Albuquerque, N.Mex.; Peter J. Fawcett, University of New Mexico, Albuquerque, N.Mex.

Dryland slopes are climatically sensitive because large changes in vegetation and weathering can result from modest changes in moisture. This session explores effects of late Quaternary and potential future climates on slope processes and forms.

Rocky Mountain National Park. Photo by Martin Miller.

CALL FOR PAPERS

TOPICAL AND DISCIPLINE SESSIONS

INVITED AND VOLUNTEERED PAPERS

ABSTRACTS DEADLINE: JULY 13

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 13
Please use the online electronic abstract form found on the GSA Web site, www.geosociety.org. An abstract submission fee will be charged. The fee is $18 for 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, mineralogy).

T1. The Future of Hydrogeology

GSA Hydrogeology Division; International Association of Hydrogeologists U.S. National Committee; National Ground Water Association

Hydrogeology

Clifford I. Voss, U.S. Geological Survey, Reston, Va.

Visions of future science and practice in hydrogeology and related geosciences will be highlighted. Speakers include but are not limited to authors in upcoming issue of *Hydrogeology Journal* on "The Future of Hydrogeology." ORAL

T2. Upcoming Revolutions in Observing Systems: Implications for Hydrogeology

GSA Hydrogeology Division

Hydrogeology; Geochemistry, Aqueous; Environmental Geoscience

John L. Wilson, New Mexico institute of Mining and Technology, Socorro, N.Mex.; Richard P. Hooper, Consortium

of Universities for the Advancement of Hydrologic Science, Inc., Washington, D.C.

Proposed environmental observing systems provide opportunities for hydrogeology to test concepts and to refine understanding of fundamental hydrologic processes. Papers are solicited that explore how such systems aid in model testing and conceptual development. ORAL

T3. History of Hydrogeology in the United States: Celebrating the Contributions of O.E. Meinzer, Stan Lohman, and John Ferris

GSA Hydrogeology Division; International Association of Hydrogeologists U.S. National Committee

Hydrogeology; History of Geology; Geoscience Education

John Ezra Moore, U.S. Environmental Protection Agency, Denver, Colo.; Philip LaMoreaux, Tuscaloosa, Ala.

The session will describe the historical basis for the development of hydrogeology (1885–1985) in the United States. ORAL

T4. Over 40 Years of Influence in Environmental Hydrogeology: In Honor of Dick Parizek

GSA Hydrogeology Division

Hydrogeology; Environmental Geoscience; Engineering Geology

Ward E. Sanford, U.S. Geological Survey, Reston, Va.; E. Scott Bair, Ohio State University, Columbus, Ohio

After 40 years of research and advising 100 graduate students in environmental hydrogeology, Dick Parizek is being honored for his contributions to water-resource exploration, wastewater treatment, mining hydrology, karst hydrology, and nuclear waste disposal. ORAL

T5. Groundwater Depletion and Overexploitation in the Denver Basin Bedrock Aquifers

GSA Hydrogeology Division; International Association of Hydrogeologists U.S. National Committee; GSA Public Policy

Hydrogeology; Engineering Geology; Geoscience Information/Communication

Peter Barkmann, Colorado Geological Survey, Denver, Colo.; John Ezra Moore, U.S. Environmental Protection Agency, Denver, Colo.

Southeast Denver relies on bedrock aquifers to supply water for new housing developments. The developers told home buyers that the aquifers would supply water for 100 years. It now appears that in many areas the supply will be depleted in less than 10 years. ORAL

T6. Hydrologic Impacts of Urbanization and Suburbanization on Water Resources

GSA Hydrogeology Division; GSA Engineering Geology Division

Hydrogeology; Environmental Geoscience; Engineering Geology

Anne E. Carey, The Ohio State University, Columbus, Ohio; W. Berry Lyons, The Ohio State University, Columbus, Ohio; John E. McCray, University of Texas, Austin, Texas; John M. Sharp, The University of Texas, Austin, Texas

By 2005, approximately 65% of Earth's population will inhabit urban areas and cause drastic effects on hydrologic systems. This session details the consequences of urbanization on water supply, water quality, ecosystem health, and land-use planning. ORAL

T7. The Occurrence, Storage, and Flow of Groundwater in Mountainous Terrain

GSA Hydrogeology Division; U.S. Geological Survey

Hydrogeology; Environmental Geoscience; Geochemistry, Aqueous

Andrew H. Manning, U.S. Geological Survey, Denver, Colo.; Jonathan Saul Caine, U.S. Geological Survey, Denver, Colo.

Because mountain hydrologic studies have traditionally focused on surface water, little is known about groundwater in mountainous terrain. This session focuses on new and integrated approaches to understanding the physical controls on these complex systems. ORAL

T8. Mountain Watershed Pollutant Transport and Water Quality Issues, Including Groundwater Surface-Water Interplay in Pollutant Transfer

GSA Hydrogeology Division

Hydrogeology

Geoffrey D. Thyne, Colorado School of Mines, Golden, Colo.; John E. McCray, University of Texas, Austin, Texas

This session invites topics in all aspects of mountain watershed pollutant transport and water-quality issues including groundwater surface-water interplay in pollutant transfer, impact mechanisms in environmentally sensitive watersheds, and innovative solutions to related environmental problems. ORAL

T9. Sustainable Management of Water Resources

GSA Geology and Public Policy Committee

Hydrogeology; Environmental Geoscience

Bridget R. Scanlon, University of Texas, Austin, Texas; Marios Sophocleous, The University of Kansas, Lawrence, Kans.

This session will focus on research related to management of water resources in a sustainable manner to meet human and ecosystem needs taking into account potential impacts of climate change, land use change, and projected population and water consumption increases on water resources. ORAL and POSTER

T10. Comprehensive Monitoring Approaches at Regional and Statewide Levels—Advantages and Limitations

GSA Hydrogeology Division; Association of Ground Water Scientists and Engineers, a Division of the National Ground Water Association

Hydrogeology; Geoscience Information/Communication

David R. Wunsch, Concord, N.H.; Charles J. Taylor

Regional and statewide groundwater monitoring is challenging because of the magnitude of scale, heterogeneity, and other hydrogeologic unknowns. We welcome contributions that describe advantages and limitations of monitoring schemes, technologies, and interagency collaboration. ORAL

T11. Hydraulic and Geochemical Behavior of Man-Made Aquifers

GSA Hydrogeology Division

Hydrogeology; Geochemistry, Aqueous

Joseph J. Donovan, West Virginia University, Morgtantown, W.Va.; Mary Stoertz, Ohio University, Athens, Ohio

Anthropogenic aquifers formed by mining, waste disposal, and geotechnical projects create environmental impacts that may persist for years. This session will present investigations of their hydraulic and geochemical behavior, including remediation and/or beneficial use aspects. ORAL

T12. Fluid Flow and Solute Transport in Fractured Rocks

GSA Hydrogeology Division

Hydrogeology

Paul A. Hsieh, U.S. Geological Survey, Menlo Park, Calif.

Advances in quantitative analysis of field investigations in fractured rocks over a broad range of length scales, from contaminant sites to regional systems. ORAL

T13. Modeling Flow and Transport in Chemically and Physically Heterogeneous Media

GSA Hydrogeology Division

Hydrogeology

Zhenxue Dai, Wright State University, Dayton, Ohio; Robert W. Ritzi, Wright State University, Dayton, Ohio

Advances in characterizing and modeling groundwater flow and chemical transport will be shared by researchers and practitioners toward better describing and understanding transport processes in heterogeneous flow systems. ORAL and POSTER

T14. Applications of Geophysics to Groundwater Resource Management

GSA Geophysics Division; GSA Hydrogeology Division

Hydrogeology; Geophysics/Tectonophysics/Seismology; Environmental Geoscience

Dennis L. Harry, Colorado State University, Fort Collins, Colo.; David W. Hyndman, Michigan State University, East Lansing, Mich.

This session showcases integrated geophysical and geological studies as applied to groundwater issues. It will include case studies of successful field programs and reports on new data acquisition and analysis techniques. ORAL

T15. How Effectively Are We Using Advanced Groundwater Modeling Tools in Practice?

GSA Hydrogeology Division

Hydrogeology

David L. Rudolph, University of Waterloo, Waterloo, Ontario; Rene Therrien, Université Laval, Quebec City, Quebec

This session addresses current pitfalls, misuses, and limitations of fluid flow and solute transport models for groundwater investigations. Improving advanced model applications and assessing the value of input data are also examined. ORAL

T16. Linking Groundwater Models and Watershed Models

GSA Hydrogeology Division; GSA Engineering Geology Division

Hydrogeology; Environmental Geoscience

Tom Winter, U.S. Geological Survey, Lakewood, Colo.

This session is intended to present the latest developments in integrating surface water into groundwater models and groundwater into watershed models, and to perhaps lay the foundations for new directions in these efforts. ORAL

T17. Aquitard Studies: Understanding Geologic Constraints on Flow and Transport in Groundwater Flow Systems

GSA Hydrogeology Division

Hydrogeology; Environmental Geoscience

Kenneth R. Bradbury, Wisconsin Geological and Natural History Survey, Madison, Wis.; Beth Parker, University of Waterloo, Waterloo, Ontario; David Hart, Wisconsin Geological and Natural History Survey, Madison, Wis.; Timothy T. Eaton, Wisconsin Geological and Natural History Survey, Madison, Wis.

This session focuses on recent advances in the hydrogeology of both near-surface and deeply-buried aquitards, including physical characterization, contaminant transport, geochemistry, monitoring, and modeling. ORAL

T18. Characterization, Attenuation, and Remediation of Contaminants in Runoff

GSA Hydrogeology Division

Hydrogeology; Geochemistry, Aqueous; Environmental Geoscience

Thomas Boving, University of Rhode Island, Kingston, R.I.; William Blanford, Louisiana State University, Baton Rouge, La.

This session encourages papers on novel approaches regarding the survey, characterization, attenuation, and remediation of organic and inorganic contaminants in runoff from urban, industrial, and agricultural land, including the deposition of airborne soot. ORAL

T19. Innovative Tracer Applications in Hydrogeology: New Techniques, Design and Interpretation Methods, and Case Studies

GSA Hydrogeology Division; International Association of Hydrogeologists—International Commission on Tracers

Hydrogeology; Geochemistry, Other

Craig E. Divine, Colorado School of Mines, Golden, Colo.; Jeffrey McDonnell, Oregon State University, Corvallis, Ore.

The use of tracers in hydrogeology has significantly increased in recent years. This session is open to papers that describe new techniques, methods for tracer test design and interpretation, and case studies in any hydrogeological application. ORAL

T20. Dissolved Gases as Indicators of Geochemical and Hydrogeologic Processes

GSA Hydrogeology Division

Hydrogeology; Geochemistry, Aqueous; Geomicrobiology

D. Kip Solomon, University of Utah, Salt Lake City, Utah; Stephen J. Van der Hoven, Illinois State University, Normal, Ill.

Dissolved gases have been used to investigate a variety of hydrogeologic processes (e.g., redox reactions, groundwater travel times, rates of recharge, denitrification, paleorecharge, etc.). Field, laboratory, and modeling studies will be included. ORAL and POSTER

T21. Vadose Zone Nitrogen: Sources, Fate and Transport

GSA Hydrogeology Division

Hydrogeology; Geochemistry, Aqueous; Geomicrobiology

Scott W. Tyler, University of Nevada, Reno, Nev.; W. Mike Edwards, Oxford University, Oxford

This session seeks to bring together hydrologists, soil physicists, soil chemists, and microbiologists to shed light on the fate and transport of nitrogen species in environments ranging from such diverse environments as domestic septic tank discharge to the hyperarid nitrate deposits of the Atacama Desert. ORAL and POSTER

T22. Assessing the Importance of Colloids in Natural Waters

GSA Hydrogeology Division

Hydrogeology; Geochemistry, Aqueous; Environmental Geoscience

James F. Ranville, Colorado School of Mines, Golden, Colo.; John C. Seaman, The University of Georgia, Aiken, S.C.

Colloids occur in most natural waters. A limited understanding of colloid abundance and characteristics hampers assessing their importance. Papers which describe new approaches to characterize colloids, model contaminant sorption, or model colloid migration are sought. ORAL and POSTER

T23. Sources, Transport, Fate, and Toxicology of Trace Elements in the Environment

International Association of Geochemistry and Cosmochemistry

Geochemistry, Aqueous; Environmental Geoscience; Geomicrobiology

David T. Long, Michigan State University, East Lansing, Mich.; LeeAnn Munk, University of Alaska Anchorage, Alaska; W. Berry Lyons, The Ohio State University, Columbus, Ohio

Papers are invited on the study of trace elements in the environment related to sources, transport, controls on mobility, toxicological consequences, ecology (e.g., food web dynamics, as limiting nutrients) and accumulation in sediments and soils. ORAL

T24. Organic Compounds in Near-Surface Environments as Drivers on the Redox-Reaction Highway: A Tribute to the Career of Mary Jo Baedecker

GSA Hydrogeology Division

Hydrogeology; Geochemistry, Organic; Geomicrobiology

Isabelle M. Cozzarelli, U.S. Geological Survey, Reston, Va.; Janet S. Herman, University of Virginia, Charlottesville, Va.; Robert P. Eaganhouse, U.S. Geological Survey, Reston, Va.

Elucidating fundamental redox reactions driven by organic matter in subsurface environments, focusing on hydrogeologic systems impacted by human activities, has been the major career contribution of Mary Jo Baedecker. Presentations building on her work are invited. ORAL and POSTER

T25. Stable Isotope Tracers of Water Balance and Biogeochemical Cycling in Large River Basins

GSA Quaternary Geology and Geomorphology Division

Geochemistry, Aqueous; Environmental Geoscience; Geochemistry, Other

Leonard I. Wassenaar, Environ Canada, Saskatoon, Saskatchewan; John Gibson, Environ Canada, Victoria, British Columbia

This session explores the application of stable isotope tracers of water, gases, and dissolved inorganic species in river discharge as a tool for examining spatio-temporal evolution of hydrologic and biogeochemical processes in large river basins. ORAL and POSTER

T26. Seasonal and Long-Term Groundwater Quality Changes in Alluvial Aquifer Systems

GSA Hydrogeology Division

Geochemistry, Aqueous; Hydrogeology; Environmental Geoscience

Wendy A. Timms, University of New South Wales; Manly Vale, New South Wales, Australia

Seasonal and long term (decadal) groundwater quality trends related to urban and agricultural development may downgrade beneficial use. Causal factors may be identified by demonstrating correlation, consistency, responsiveness and a physical process. ORAL and POSTER

T27. Characterization and Representation of Flow through Karst Aquifers

GSA Hydrogeology Division

Hydrogeology; Sediments, Carbonates; Environmental Geoscience

Allan D. Woodbury, University of Manitoba, Winnipeg, Manitoba; Ron Green, Southwest Research Institute, San Antonio, Texas

The overall theme of the session is to examine enhanced capabilities for karst aquifer characterization and flow representation to support the quantitative evaluation and management of the water resources of karst systems. We seek original contributions in new modeling tools, guidelines for applications of either new or existing tools, and improved understanding of data collection needs to support modeling efforts. ORAL

T28. New Perspectives in Karst Geomicrobiology and Redox Geochemistry

GSA Hydrogeology Division; Karst Waters Institute; GSA Geobiology and Geomicrobiology Division

Hydrogeology; Geomicrobiology; Geochemistry, Other

Annette Engel, The University of Texas, Austin, Texas; Toby Dogwiler, Winona State University, Winona, Minn.; Diana Northup, University of New Mexico, Albuquerque, N.Mex.

In the ten years since the Karst Waters Institute–sponsored conference, there has been considerable progress in understanding microbial systems, geochemical processes, and the interactions between them in cave and karst settings. We welcome contributions that highlight these major achievements and latest advances. We encourage interdisciplinary participation from related hydrogeologic and biogeochemical settings. ORAL and POSTER

T29. From Subterranean Crawlways to Scientific Hallways: Research on Our Public Cave and Karst Lands

National Park Service; National Cave and Karst Research Institute

Quaternary Geology/Geomorphology; Hydrogeology; Environmental Geoscience

Louise D. Hose, National Cave and Karst Research Institute, Carlsbad, N.Mex.; Penelope J. Boston, New Mexico Institute of Mining and Technology, Socorro, N.Mex.

Public lands provide unique natural laboratories and have facilitated important advancements in our understanding of cave and karst systems. This session focuses on both fundamental and significant discoveries to applied research in publicly managed karst terrains. ORAL and POSTER

T30. New and Multidisciplinary Approaches to Dating Cave Deposits

GSA Archaeological Geology Division; Karst Waters Institute

Archaeological Geology; Quaternary Geology/Geomorphology; Geochemistry, Other

Donald McFarlane, The Claremont Colleges, Claremont, Calif.; Joyce Lundberg, Carleton University, Ottawa, Ontario

Addressing the integration of technological and methodological advances in the dating of cave deposits, with the experimental and/or successful application of multiple and/or innovative techniques to resolve long and complex speleological records. ORAL and POSTER

T31. Impacts of Water Storage and Consumption on Watershed Processes

GSA Quaternary Geology and Geomorphology Division; GSA Engineering Geology Division

Quaternary Geology/Geomorphology

Sara L. Rathburn, Colorado State University, Fort Collins, Colo.; Ellen E. Wohl, Colorado State University, Fort Collins, Colo.

Water storage and consumption structures dictate water and sediment delivery to most watersheds. The myriad responses of watersheds to the imposed regulation informs us of the resilience and future of our fluvial systems. ORAL

T32. Geological Mapping: Providing for Successful Water and Land Resource Planning (Posters)

GSA Quaternary Geology and Geomorphology Division; GSA Engineering Geology Division; GSA Geology and Society Division; GSA Geology and Public Policy Committee; GSA Hydrogeology Division; Association of American State Geologists

Quaternary Geology/Geomorphology; Hydrogeology; Engineering Geology

Richard C. Berg, Illinois State Geological Survey, Champaign, Ill.; Harvey Thorleifson, Minnesota Geological Survey, St. Paul, Minn.; Peter T. Lyttle, U.S. Geological Survey, Reston, Va.

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

T33. Geologic Disposal of Radioactive Waste: Rising to the Challenge of Regulatory Requirements and Environmental Protection at the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico, and the Yucca Mountain Site, Southern Nevada

GSA Hydrogeology Division; U.S. Department of Energy; GSA Geology and Public Policy Committee

Public Policy; Environmental Geoscience; Hydrogeology

Robert A. Levich, U.S. Department of Energy, Las Vegas, Nev.; Russell L. Patterson, Carlsbad, N.Mex.; Ronald M. Linden, Las Vegas, Nev.

Recertification of WIPP and license application submittal for Yucca Mountain present technical and regulatory challenges concerning repository performance. Presentations highlight science and engineering supporting the development and safe operation of geologic repositories for radioactive waste. ORAL

T34. Monitoring to Confirm Performance Assessment of Nuclear Waste and Decommissioning Sites: Geoscience Input to Monitoring System Design through Identification and Measurement of Critical Features, Events, and Processes

GSA Hydrogeology Division

Environmental Geoscience; Hydrogeology; Public Policy

George V. Last, Pacific Northwest National Lab, Richland, Wash.; Tom Temples, University of South Carolina, Columbia, S.C.; Van Price, Advanced Environmental Solutions, LLC, Lexington, S.C.

Critical geo-input to be obtained and retained in computer models for performance assessment. Case histories. Focus positive—identify critical features and measurements and assure that these are represented and updated in site (performance) models. ORAL

T35. Assessment and Characterization of Geologic Formations for Long-Term CO_2 Storage (Sequestration)

GSA Geology and Public Policy Committee

Stratigraphy; Hydrogeology; Structural Geology

Jonathan J. Kolak, U.S. Geological Survey, Reston, Va.; Sean Brennan, U.S. Geological Survey, Reston, Va.

This session will explore novel approaches to assess the capacity and integrity of geologic formations for long-term CO_2 storage (sequestration). These approaches may include aspects of geochemistry, hydrogeology, geospatial analysis, or other innovative methods. ORAL

T36. Geophysical Solutions for Characterizing and Locating Geological Sites for Carbon Dioxide Sequestration

GSA Geophysics Division

Geophysics/Tectonophysics/Seismology; Engineering Geology; Public Policy

John H. McBride, Brigham Young University, Provo, Utah; James A. Drahovzal, University of Kentucky, Lexington, Ky.; Hannes E. Leetaru, Illinois State Geological Survey, Champaign, Ill.; John Rupp, Indiana Geological Survey, Bloomington, Ind.

Papers are solicited on using geophysical and geological subsurface remote sensing for locating, characterizing, and mapping buried structures that could serve as sites for carbon dioxide sequestration as well as on the societal issues involved. ORAL

T37. GIS, GPS, and Remote Sensing in Geologic Hazard Assessment

GSA Engineering Geology Division

Engineering Geology; Remote Sensing/Geographic Information System; Public Policy

William C. Haneberg, Haneberg Geoscience, Seattle, Wash.; Norman S. Levine, Charleston, S.C.

Case histories and research using geographic information system, Global Positioning System, or remote sensing (including LiDAR [light detection and ranging], InSAR [interferometric synthetic aperture radar], digital elevation models, or hyperspectral imaging) for mapping or simulating landslides, debris flows, floods, neotectonic and volcanic processes, subsidence, karst, and other hazards. ORAL and POSTER

T38. Rural Source Water Protection—Stakeholder Needs, Public Policy, and Hydrogeologic Realities for Small Systems

GSA Hydrogeology Division; U.S. Environmental Protection Agency, Office of Water

Environmental Geoscience; Geoscience Information/Communication; Hydrogeology

John All, Western Kentucky University Technical Assistance Center for Water Quality, Bowling Green, Ky.; Chris Groves, Hoffman Environmental Research Institute, Bowling Green, Ky.; Stephen Kenworthy, Western Kentucky University Technical Assistance Center for Water Quality, Bowling Green, Ky.

Clean drinking water is a fundamental requirement for human health. Supplies depend on hydrogeologic, economic, and cultural variables and rural systems face particular challenges. We solicit papers on source water protection strategies serving these goals. ORAL

T39. Current Perspectives in Environmental Biogeochemistry

GSA Hydrogeology Division; GSA Geobiology and Geomicrobiology Division

Environmental Geoscience; Geochemistry, Aqueous; Hydrogeology

Dibyendu Sarkar, University of Texas, San Antonio, Texas; Rupali Datta, University of Texas, San Antonio, Texas

This session will promote interchange of scientific information among earth scientists interested in environmental biogeochemical issues. It will provide a forum for researchers to present recent findings that can stimulate development of future interdisciplinary research. ORAL

T40. Hydrogeomorphology, Chemistry, Archaeology, and Evolution of Coastal Plain Depressions and Related Features

GSA Hydrogeology Division

Hydrogeology; Quaternary Geology/Geomorphology; Stratigraphy

C. William Zanner, University of Nebraska, Lincoln, Nebr.; Andrew H. Ivester, University of West Georgia, Carrollton, Ga.

This session explores current understanding of the geomorphologic and hydrologic histories of Carolina bays and related depressional features. ORAL and POSTER

T41. The Gulf of Mexico—Past, Present, and Future: Relating Ecology to Geology

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

Charles W. Holmes, Center for Coastal Geology, St. Petersburg, Fla.; John W. Tunnell, Harte Institute for Gulf of Mexico Research, Corpus Christi, Texas

The session's goal is twofold: (1) to update the status of geologic knowledge in the Gulf of Mexico, and (2) to relate the surface geologic processes to the ecology of various regions. ORAL and POSTER

T42. Authigenic Minerals in Modern and Ancient Terrestrial Aquatic Environments

GSA Limnogeology Division; GSA Sedimentary Geology Division

Limnogeology; Sediments, Carbonates; Sediments, Clastic

Daniel Larsen, University of Memphis, Memphis, Tenn.; Daniel Deocampo, California State University, Sacramento, Calif.

This session will present new ideas and concepts toward understanding and interpreting authigenic mineral processes in ancient and modern terrestrial aquatic environments, ranging from riverine or wetland to deep lacustrine settings. ORAL

T43. Hydrologic and Paleoclimatic Significance of Nonmarine Microbial Carbonates (Tufas, Microbialites, Stromatolites and Thrombolites)

GSA Limnogeology Division

Limnogeology; Sediments, Carbonates; Paleoclimatology/Paleoceanography

Michael R. Rosen, U.S. Geological Survey, Carson City, Nev.; Robin Renaut, University of Saskatchewan, Saskatoon

This session explores the sedimentological record of nonmarine microbial carbonates and demonstrates the diversity of records that can be derived from these deposits. Emphasis is on lacustrine systems, but other nonmarine microbial carbonates will be considered. ORAL

T44. Lacustrine Records of Landscape Evolution

GSA Limnogeology Division; GSA Quaternary Geology and Geomorphology Division; GSA Sedimentary Geology Division

Limnogeology; Quaternary Geology/Geomorphology; Sediments, Clastic

Jeffrey T. Pietras, BP Exploration Alaska, Inc., Anchorage, Alaska; Eric C. Carson, San Jacinto College, Houston, Texas; Alan R. Carroll, University of Wisconsin, Madison, Wis.

Lacustrine strata contain a bountiful archive of terrestrial geomorphic, tectonic, and climatic events. This session addresses the intersections of geomorphology, sedimentology, and stratigraphy for interpreting the lacustrine geologic record of terrestrial landscape change, focusing on the Cenozoic. ORAL

T45. Alkaline Evaporative Lakes and Playas: Insights into Microbial Physiology and Mineral Facies in Semiarid Settings

GSA Geobiology and Geomicrobiology Division; Limnogeology and Sedimentary Geology

Geomicrobiology; Geochemistry, Aqueous; Limnogeology

David Finkelstein, Indiana University, Bloomington, Ind.; Thomas R. Kulp, U.S. Geological Survey, Menlo Park, Calif.; Lisa M. Pratt, Indiana University, Bloomington, Ind.

This session will elucidate the role of alkaline solutions in weathering, evaporite precipitation, and microbial physiology. Topics will focus on the geochemical and isotopic signatures of alkalaphilic microbes, mineral facies, and redox gradients. ORAL and POSTER

T46. Biomineralization in Terrestrial Hot Springs: The Preservation of Thermophiles in Past and Present-Day Systems

GSA Geobiology and Geomicrobiology Division

Geomicrobiology; Paleontology/Paleobotany; Geochemistry, Aqueous

Paul A. Schroeder, University of Georgia, Athens, Ga.; Sherry L. Cady, Portland State University, Portland, Ore.

This session invites those who study modern terrestrial hot springs with an eye for mineral-microbe relationships and how evidence for life might be preserved. Analog studies of ancient hot spring deposits are also welcomed. ORAL

T47. Ocean Chemistry through the Precambrian and Paleozoic

Paleoclimatology/Paleoceanography; Sediments, Carbonates; Geochemistry, Other

Matthew R. Saltzman, The Ohio State University, Columbus, Ohio; Michael C. Pope, Washington State University, Pullman, Wash.

Considerable evidence reveals significant changes in the chemistry of the oceans during the Precambrian and Paleozoic. These changes have implications for Earth's climate and biosphere. We will focus on a combined data-modeling approach. ORAL

T48. Unraveling the History of Ocean Crust Production: Evidence For and Against Changes in Seafloor Spreading Rates Since the Mesozoic

Paleoclimatology/Paleoceanography; Tectonics; Geochemistry, Other

Jenney M. Hall, Yale University, New Haven, Conn.; David B. Rowley, University of Chicago, Chicago, Ill.; Mark Pagani, Yale University, New Haven, Conn.

This session invites evidence for and against changes in the rate of seafloor crust production as well as implications regarding the global carbon cycle and secular changes in seawater chemistry from both modeling results and empirical data. ORAL and POSTER

T49. Stable Isotopes in Fossils and Paleosols: Records of Late Cenozoic Environmental Change

Geochemistry, Other; Paleoclimatology/Paleoceanography; Paleontology/Paleobotany

Yang Wang, Florida State University and National High Magnetic Field Laboratory, Tallahassee, Fla.; Pennilyn Higgins, University of Florida, Gainesville, Fla.

Stable isotope analysis has been established as a valuable tool for reconstructing past terrestrial environments. This session will examine isotopic records to better understand the links among biological, climatic, and tectonic change. ORAL

T50. Marine Hard Substrates: Colonization and Evolution

Paleontological Society

Paleontology/Paleobotany; Marine/Coastal Science; Stratigraphy

Stephen K. Donovan, National Natuurhistorisch Museum, Leiden, Netherlands; Paul D. Taylor, The Natural History Museum, London, United Kingdom

Marine hard substrates represent a distinct suite of habitats that have seen a range of evolutionary innovations during the Phanerozoic. This meeting will review new data and ideas on these ecosystems and their evolution. ORAL

T51. Protistan Paleobiodiversity: Understanding Evolutionary Patterns

Cushman Foundation

Paleontology/Paleobotany; Paleoclimatology/Paleoceanography; Geomicrobiology

Susan T. Goldstein, University of Georgia, Athens, Ga.; Brian T. Huber, Smithsonian Institution, Washington, D.C.

Rich and well-documented, the protistan fossil record provides the foundation for diverse global change studies. This session focuses on understanding the evolutionary mechanisms and phylogenetic relationships underpinning protistan biodiversity in modern and ancient systems. ORAL

T52. The Hunters and the Hunted: Predation On and By Gastropods

Paleontological Society

Paleontology/Paleobotany

Patricia H. Kelley, University of North Carolina, Wilmington, N.C.; Thor A. Hansen, Western Washington University, Bellingham, Wash.; Gregory P. Dietl, University of North Carolina, Wilmington, N.C.

Fossil gastropods preserve evidence of predator-prey interactions useful in studying the ecological and evolutionary consequences of predation. Presentations will address predation on and by fossil gastropods and Recent taxa useful in interpreting the fossil record. ORAL

T53. Critical Events in the Evolution of Terrestrial Arthropods

Paleontological Society; GSA Geobiology and Geomicrobiology Division

Paleontology/Paleobotany; Sediments, Clastic; Stratigraphy

Robert E. Nelson, Colby College, Waterville, Maine; Dena M. Smith, University of Colorado, Boulder, Colo.; S. Bruce Archibald, Harvard University, Cambridge, Mass.

Insects and terrestrial arthropods comprise >90% of all named animal species on Earth. Their fossil record is far less well-known. What are the events that have led to the evolution of terrestrial arthropod clades? ORAL and POSTER

T54. The Evolution and Expansion of C4 Plants

Paleontology/Paleobotany; Paleoclimatology/Paleoceanography; Geochemistry Organic

Mark Pagani, Yale University, New Haven, Conn.; Darren Grocke, McMaster University, Hamilton, Ontario

The evolutionary history and expansion of C4 plants impact our interpretation of atmospheric CO_2 concentrations, temperature, and seasonal aridity. This session explores the history of C4 photosynthesis during the Mesozoic and Cenozoic. ORAL and POSTER

T55. Anatomy of an Anachronistic Period: The Early Triassic Environment and Its Effect on the History of Life

Paleontological Society

Paleontology/Paleobotany; Sediments, Carbonates; Paleoclimatology/Paleoceanography

Adam D. Woods, California State University, Fullerton, Calif.; Frank Corsetti, University of Southern California, Los Angeles, Calif.

The Early Triassic was one of the most unique periods in Earth's history. This session will examine the usual nature of environmental conditions during the period as well as paleobiological trends across the critical interval between the End-Permian extinction and initiation of the biotic recovery in the early Middle Triassic. ORAL

T56. Paleontology and Stratigraphy of the Late Eocene Florissant Formation, Colorado

Paleontological Society

Paleontology/Paleobotany; Geoscience Information/Communication; History of Geology

Herbert W. Meyer, Florissant Fossil Beds National Monument, Florissant, Colo.; Dena Smith, University of Colorado, Boulder, Colo.

This session will explore the paleontology, stratigraphic setting, and historical study of the late Eocene plants, insects, and vertebrates from Florissant, including recent work in taxonomy, taphonomy, paleoecology, lithostratigraphy, magnetostratigraphy, conservation, and applications of information technology. ORAL

T57. The Concept of Layer-Cake Stratigraphy—Then and Now

GSA History of Geology Division; GSA Sedimentary Geology Division

History of Geology; Stratigraphy

Charles W. Byers, University of Wisconsin, Madison, Wis.

The concept of layer-cake (time-parallel) stratigraphy was widely accepted during the nineteenth century. It was eclipsed by the facies concept for decades but has made a resurgence in the guise of sequence and event stratigraphy. ORAL

T58. Sedimentary and Stratigraphic Principles and Concepts Applied to the Study of Metamorphic Terranes and Igneous Provinces

North American Commission on Stratigraphic Nomenclature

Petrology, Metamorphic; Sediments, Clastic; Economic Geology

Lisa Lytle, Golden, Colo.; Thomas R. Fisher, Golden, Colo.

This session will focus on integration of modern sedimentologic and stratigraphic concepts with studies of metamorphic and igneous provinces. These methods may improve our understanding of continental accretion, paleoplacers, ore deposits, and layered mafic intrusions. ORAL

T59. Resolving the Late Paleozoic Gondwanan Ice Age in Time and Space: Comparison of Southern and Northern Hemisphere Records

Stratigraphy; Sediments, Clastic; Sediments, Carbonates

Christopher R. Fielding, University of Nebraska, Lincoln, Nebr.; Tracy D. Frank, University of Nebraska, Lincoln, Nebr.

This session aims to bring together stratigraphers, sedimentologists and geochemists who are working on the climate record of the Carboniferous and Permian systems worldwide. Emphasis will be placed on integrating geochemical with lithostratigraphic archives. ORAL

T60. Sedimentary Geology and Earth History: Retrospective and Prospective: In Honor of the Career and Contributions of Robert H. Dott Jr.

GSA Sedimentary Geology Division; GSA History of Geology Division

Stratigraphy; History of Geology; Geoscience Education

Joanne Bourgeois, University of Washington, Seattle, Wash.; Marjorie A. Chan, University of Utah, Salt Lake City, Utah; Gary Kocurek, University of Texas, Austin, Texas

Bob Dott's career has spanned important changes in sedimentary geology and Earth's history and in the philosophy of geology. Students and colleagues of Bob Dott will reflect on those changes, and on his research and educational contributions. ORAL and POSTER

T61. Frontier in Understanding the Geologic Record of Climate Change: A Session in Honor of William W. Hay

GSA Sedimentary Geology Division; GSA Geobiology and Geomicrobiology Division; GSA Limnogeology Division; GSA Structural Geology and Tectonics Division

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

Eric J. Barron, Pennsylvania State University, University Park, Pa.; Robert DeConto, University of Massachusetts, Amherst, Mass.

A remarkable revolution has taken place in the geosciences associated with a growing understanding of climate and climate change. This revolution is providing context for much of our interpretation and understanding of the earth system. ORAL and POSTER

T62. Wild Coal Fires: Burning Questions with Global Consequences?

GSA Coal Geology Division

Coal Geology; Environmental Geoscience; Engineering Geology

Glenn Blair Stracher, East Georgia College, University System of Georgia, Swainsboro, Ga.; Ed Heffern, Cheyenne, Wyo.

This session will feature presentations and discussions about all aspects of these catastrophic fires, including global consequences. ORAL

T63. Raton Basin: From Coal to Coalbed Methane

GSA Coal Geology Division

Coal Geology; Tectonics; Hydrogeology

Gretchen K. Hoffman, New Mexico Institute of Mining and Technology, Socorro, N.Mex.; Christopher J. Carroll, Colorado Geological Survey, Denver, Colo.

This session is designed to highlight the latest regional coal geology, tectonic, geochemistry and hydrologic research being done throughout the Raton Basin. The session will be dedicated to Charles Pillmore. ORAL and POSTER

T64. Genetic Links among Syngenetic Metal Accumulations in Sedimentary Basins: Giant Sediment-Hosted Metal Deposits to Metalliferous Black Shales

Society of Economic Geologists

Economic Geology

Poul Emsbo, U.S. Geological Survey, Denver, Colo.; Eric E. Hiatt, University of Wisconsin, Oshkosh, Wis.

This multidisciplinary session will explore the origin of sediment-hosted metal accumulations, the conditions that result in formation of diverse types in correlative strata, and their links to secular variations in ocean chemistry. ORAL

T65. Stable Isotopes of Ore-forming Metals: Analysis and Applications

Economic Geology; Geochemistry, Other; Environmental Geoscience

Jamie J. Wilkinson, Imperial College London, London

The aim of this session is to bring together researchers who are at the cutting edge of the new field of transition metal isotope geochemistry, applying metal isotope systematics to understanding problems in ore deposit genesis. ORAL

T66. 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; Geochemistry, Other; Petrology, Metamorphic

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

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

T67. Advanced Characterization of the Structures and Behaviors of Minerals

Mineralogical Society of America

Mineralogy/Crystallography

Peter J. Heaney, Pennsylvania State University, University Park, Pa.; Jeffrey E. Post, Smithsonian Institution, Washington, D.C.; Michael C. Carpenter, Tucson, Ariz.

Innovations in microanalytical and microstructural characterization techniques are providing a deeper understanding of the factors that control mineral reaction mechanisms. This session invites contributions that explore the relation between atomic scale structure and macroscale behavior. ORAL

T68. Nano-Geochemistry and Nano-Structures in Earth Systems

Geochemistry, Other; Mineralogy/Crystallography; Environmental Geoscience

Huifang Xu, University of New Mexico, Albuquerque, N.Mex.

Nano-structures and self-assembled nano-structures can provide information about their formation. Geochemical reactions in confined nanopores are different from those in bulk systems. This session will focus on nano-scale processes in geological environments. ORAL and POSTER

T69. Looking Forward to the Past: A Session in Honor of Paul Ribbe and the Reviews in Mineralogy and Geochemistry

Mineralogical Society of America

Mineralogy/Crystallography; Petrology, Experimental; Petrology, Metamorphic

Ross Angel, Virginia Tech, Blacksburg, Va.; Nancy Ross, Virginia Tech, Blacksburg, Va.

Contributions that reflect on any past, present or future aspect of the topics that have been covered by the *Reviews in Mineralogy and Geochemistry* are invited for this mineralogy session in honor of Paul Ribbe. ORAL and POSTER

T70. Modeling Grain-Scale Processes in Metamorphic Rocks

Mineralogical Society of America; GSA Structure and Tectonics Division

Petrology, Metamorphic; Structural Geology; Mineralogy/Crystallography

W.D. Carlson, University of Texas, Austin, Texas; C.T. Foster, University of Iowa, Iowa City, Iowa

This session will synthesize recent advances stemming from a broad range of approaches to modeling deformation and reaction processes at the mm to cm scale in metamorphic rocks. ORAL and POSTER

T71. Granitic Pegmatites: Recent Advances in Mineralogy, Petrology, and Understanding

Mineralogical Society of America

Petrology, Igneous; Mineralogy/Crystallography; Geochemistry, Other

David London, University of Oklahoma, Norman, Okla.

Recent contributions to the mineralogy, petrology, and genesis of granitic pegmatites are welcome. Topics to be covered include mineral chemistry and stability, melt inclusions, experimental petrology, numerical models, field geology, and mining. ORAL and POSTER

T72. Impact Geology

GSA Planetary Geology Division

Planetary Geology

David King, Auburn University, Auburn, Ala; Jared Morrow, University of Northern Colorado, Greeley, Colo.

A session devoted to the emerging field of impact studies, including astronomy, impact-related archaeology, cratering, impact modeling, shock metamorphism, mass extinctions, meteoritics, tektite studies, and ejecta stratigraphy. ORAL and POSTER

T73. Early Paleoproterozoic (2.5–2.0 Ga) Events and Rates: Bridging Field Studies and Models

Precambrian (At Large); Geochemical Society; GSA Sedimentary Geology Division, SEPM—Society for Sedimentary Geology, Astrobiology Program

Precambrian Geology; Paleoclimatology/Paleoceanography; Tectonics

Andrey Bekker, Geophysical Lab, Carnegie Institution of Washington, Washington, D.C.; Mark E. Barley, The University of Western Australia, Western Australia, Australia; Robert H. Rainbird, Geological Survey of Canada, Ottawa, Ontario

Field-oriented and modeling studies dealing with the 2.5–2.0 Ga Earth's evolution are invited. Session will be focused on relationships between tectonics, change in atmospheric composition, and climatic changes as well as the rates of these changes. ORAL

T74. 1500 to 2500 Ma: A Period of Changing Mantle Regimes in Earth History?

Precambrian (At Large); GSA Geophysics Division

Precambrian Geology; Tectonics; Paleoclimatology/Paleoceanography

Kent C. Condie, New Mexico Institute of Mining and Technology, Socorro, N.Mex.; Dallas Abbott, Lamont-Doherty Earth Observatory, Palisades, N.Y.

This session will focus on change and interaction of earth systems between 1500 and 2500 Ma. Papers are especially solicited that deal with mantle dynamics, crustal evolution, the supercontinent cycle, and paleoclimatic regimes. ORAL

T75. A Xenolith Perspective on the Physical and Chemical Evolution of Continental Lithosphere

GSA Structural Geology and Tectonics Division; Mineralogical Society of America; GSA Geophysics Division

Geochemistry, Other; Geophysics/Tectonophysics/Seismology; Petrology, Metamorphic

Jane Selverstone, University of New Mexico, Albuquerque, N.Mex.; Roberta L. Rudnick, University of Maryland, College Park, Md.

We seek contributions from a diversity of disciplines to examine the role that mantle and crustal xenolith studies play in constraining the composition, age, physical properties, and petrologic evolution of continental lithosphere. ORAL and POSTER

T76. Pre-EarthScope Synthesis of the Rocky Mountains I: Framing the Key Geological, Geophysical, and Geodynamic Controversies

GSA Structural Geology and Tectonics Division; GSA Geophysics Division; Rocky Mountain Association of Geologists; Colorado Scientific Society; EarthScope

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

Karl E. Karlstrom, University of New Mexico, Albuquerque, N.Mex.; Rick Aster, New Mexico Institute of Mining and Technology, Socorro, N.Mex.

Synthesis of controversies related to lithospheric evolution of the Rocky Mountain region, with linkages among the geology, geophysics, geomorphology, and geodynamics communities to help shape an interdisciplinary approach to a still-embryonic EarthScope science program. ORAL and POSTER

T77. Pre-EarthScope Synthesis of the Rocky Mountains II: Surface Processes, Geodynamics, and the Roles of Neotectonics and Climate in Development of Modern Topography

GSA Structural Geology and Tectonics Division; GSA Geophysics Division; GSA Quaternary Geology and Geomorphology Division; Rocky Mountain Association of Geologists; Colorado Scientific Society; EarthScope

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

Eric Kirby, Pennsylvania State University, University Park, Pa.

Studies of rock and surface uplift and development of the present topography, including studies of paleoelevation, mantle to surface interconnections, geodynamics of intracratonic deformation, and relative importance of neotectonics versus climate in development of relief. ORAL and POSTER

T78. Pre-EarthScope Synthesis of the Rocky Mountains III: New Advances in Laramide Deformation and Tectonics of Rocky Mountain Basement-Involved Structures: In Honor of Donald L. Blackstone Jr.

GSA Structural Geology and Tectonics Division; GSA Geophysics Division; Wyoming Geological Association; Rocky Mountain Association of Geologists; Colorado Scientific Society; EarthScope

Structural Geology; Tectonics; Geophysics/Tectonophysics/Seismology

Eric Erslev, Colorado State University, Fort Collins, Colo.; David Lageson, Montana State University, Bozeman, Mont.; Arthur Snoke, University of Wyoming, Laramie, Wyo.

This session honors Don Blackstone's pioneering work on Rocky Mountain structures by presenting new geological and geophysical studies of Laramide structures that provide important insights into the linkage between basement-involved foreland structures and lithospheric processes. ORAL and POSTER

T79. Pre-EarthScope Synthesis of the Rocky Mountains IV: New Ideas on Late Paleozoic Intraplate Orogenesis: The Greater Ancestral Rocky Mountains

GSA Structural Geology and Tectonics Division; GSA Geophysics Division; Friends of the Ancestral Rocky Mountains; EarthScope

Tectonics; Stratigraphy; Structural Geology

Charles F. Kluth, Colorado School of Mines, Golden, Colo.; Gerilyn S. Soreghan, University of Oklahoma, Norman, Okla.

This session will provide a forum for new data and interpretations on late Paleozoic tectonics and tectonic-climatic interactions in western Pangea, enabling integration of ideas from diverse geographic settings and scientific disciplines. ORAL and POSTER

T80. Pre-EarthScope Synthesis of the Rocky Mountains V: New Insights in Basement Tectonics, Deep Crustal Structure and Precambrian Tectonic Evolution

GSA Structural Geology and Tectonics Division; GSA Geophysics Division; Rocky Mountain Association of Geologists; Colorado Scientific Society; EarthScope

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

Michael Williams, University of Massachusetts, Amherst, Mass.; Karl E. Karlstrom, University of New Mexico, Albuquerque, N.Mex.

Studies of processes of accretion of juvenile lithosphere, location of major sutures, lithospheric stabilization and reactivation processes, and cumulative tectonic evolution of the basement leading to today's geophysical state of the crust and upper mantle. ORAL and POSTER

T81. Regional Geology of the Northern Rockies: A Session Honoring Betty Skipp

GSA Structural Geology and Tectonics Division; GSA Sedimentary Geology Division; SEPM—Society for Sedimentary Geology

Tectonics; Structural Geology; Stratigraphy

Paul K. Link, Idaho State University, Pocatello, Idaho; Susanne Janecke, Utah State University, Logan, Utah; David Lageson, Montana State University, Bozeman, Mont.

For 50 years, Betty Skipp, U.S. Geological Survey, has, learned, taught, and led by example in understanding the paleontological, sedimentary, and structural development of the northern Rocky Mountains. Historical syntheses, state-of-the-art ideas, and student papers are welcomed. ORAL and POSTER

T82. Bill Braddock's Backyard—Proterozoic to Recent Geology of the Northern Colorado Front Range

GSA Structural Geology and Tectonics Division

Precambrian Geology; Structural Geology; History of Geology

James C. Cole, U.S. Geological Survey, Denver, Colo.; William Nesse, University of Northern Colorado, Greeley, Colo.

An eclectic session reflecting the broad interests and accomplishments of one of Colorado's premier field geologists in one of the most scenic and geologically diverse outdoor laboratories. A tribute to the career of William A. Braddock. ORAL

T83. Cordilleran Arc Magmatism, BATHOLITHS and Continental Crustal Genesis

GSA Geophysics Division; GSA Structural Geology and Tectonics Division

Tectonics; Petrology, Igneous; Geophysics/Tectonophysics/Seismology

Mihai N. Ducea, University of Arizona, Tucson, Ariz.; Christopher Andronicos, University of Texas, El Paso, Texas; Paul Wetmore, University of Arizona, Tucson, Ariz.

Petrologists, geochronologists, structural geologists, and geophysicists will present data and models on the evolution of continental arcs, with a special emphasis on the Coast Mountains batholith and preliminary data from the National Science Foundation Continental Dynamics project BATHOLITHS. ORAL

T84. Terrane Translation, Orogenesis, and Plate Interactions in the Late Mesozoic to Early Cenozoic North American Cordillera, and Implications for Paleogeographic Reconstructions

GSA Geophysics Division; GSA Structural Geology and Tectonics Division

Tectonics; Stratigraphy; Geophysics/Tectonophysics/Seismology

Paul Umhoefer, Northern Arizona University, Box 4099, Flagstaff, Ariz.; Sandra Wyld, University of Georgia, Athens,Ga.; James E. Wright, University of Georgia, Athens, Ga.

Session will focus on the interrelations among terrane translation, orogenesis, and plate motions; the amount and sense of terrane displacements; and the implications of new and existing data for paleogeographic and tectonic reconstructions. ORAL and POSTER

T85. Whence the Mountains? New Developments in the Tectonic Evolution of Orogenic Belts: Celebrating the Dynamic Career of Raymond A. Price at the 50-Year Mark

GSA Structural Geology and Tectonics Division; Geological Association of Canada

Tectonics; Structural Geology; Geophysics/Tectonophysics/Seismology

James W. Sears, University of Montana, Missoula, Mont.; Tekla A. Harms, Amherst College, Amherst, Mass.; Carol Evenchick, Natural Resources Canada, Vancouver, British Columbia

An investigation into the tectonic evolution of ancient and active mountain belts from around the globe, using traditional and innovative methods at all scales of observation. ORAL and POSTER

T86. Ribbon Continents: Their Origin, Development, and Role in Rifting and Orogenesis

GSA Structural Geology and Tectonics Division; GSA Geophysics Division

Tectonics; Structural Geology; Geophysics/Tectonophysics/Seismology

Phil J.A. McCausland, University of Michigan, Ann Arbor, Mich.; Stephen T. Johnston, University of Victoria, Victoria, British Columbia

Ribbon continents, long assemblages of rifted continental fragments and intraoceanic arcs, are a locus of crustal deformation and growth. This session explores their occurrence and role in the evolution of continental margins and orogenic belts. ORAL

T87. Recent Advances in Himalayan Geology

GSA Structural Geology and Tectonics Division

Tectonics; Volcanology; Geophysics/Tectonophysics/Seismology

Elizabeth J. Catlos, Oklahoma State University, Stillwater, Okla.; Richard A. Marston, Oklahoma State University, Stillwater, Okla.

Recent discoveries regarding the evolution of the Himalayas will be examined with the goal of disseminating and exploring broader implications of information gained from this type locality of continent-continent convergence. ORAL

T88. Thrust Belts and Plateaus: The Anatomy of Convergent Systems

GSA Structural Geology and Tectonics Division; GSA Geophysics Division

Tectonics; Geophysics/Tectonophysics/Seismology; Structural Geology

Delores M. Robinson, University of Alabama, Tuscaloosa, Ala.; Nadine McQuarrie, California Institute of Technology, Pasadena, Calif.

We encourage papers that explore the linkage between foreland fold-thrust belts and adjacent hinterland plateaus in orogenic systems through deformation and elevation histories and mechanisms, rates of uplift and erosion, kinematic processes, and morphology. ORAL and POSTER

T89. Tectonic Evolution of the Arctic Basin and its Margins

GSA Structural Geology and Tectonics Division

Tectonics; Geophysics/Tectonophysics/Seismology; Marine/Coastal Science

Jaime Toro, West Virginia University, Morgantown, W.Va.; Jeffrey M. Amato, New Mexico State University, Las Cruces, N.Mex.

This session highlights the tectonic evolution of one of the least understood regions of Earth: the Arctic oceanic basin and the surrounding margins and continental terranes. ORAL and POSTER

T90. Low-angle Normal Faults and Faulting: Field Studies, Fault Rocks, Mechanics, and Weakening Mechanisms

GSA Structural Geology and Tectonics Division; GSA Geophysics Division

Structural Geology; Tectonics; Petrology, Metamorphic

Robert E. Holdsworth, University of Durham, Durham, United Kingdom; Darrel S. Cowan, University of Washington, Seattle, Wash.; Cristiano Collettini, Universitá di Perugia, Perugia, Italy

An interdisciplinary session where field geologists, experimentalists, seismologists, geodynamicists, and others can present observational evidence and theoretical insights on low-angle normal faults and faulting. ORAL and POSTER

T91. Paleomagnetism and Rock Magnetism Perspective of Shear Zone Kinematics

GSA Geophysics Division; GSA Structural Geology and Tectonics Division

Geophysics/Tectonophysics/Seismology; Tectonics; Structural Geology

Tim F. Wawrzyniec, University of New Mexico, Albuquerque, N.Mex.; Mike Petronis, University of New Mexico, Albuquerque, N.Mex.

Integrated studies of shear-zone processes benefit greatly from applied paleomagnetic and rock magnetic investigations. The goal of this session is to demonstrate from a geophysical perspective the applications and caveats of applied paleomagnetism and rock magnetic studies in understanding shear zone kinematics. ORAL and POSTER

T92. Neotectonics and Earthquake Potential of the Eastern Mediterranean Region

GSA Structural Geology and Tectonics Division; GSA Geophysics Division

Geophysics/Tectonophysics/Seismology; Neotectonics/Paleoseismology; Tectonics

Ibrahim Çemen, Oklahoma State University, Stillwater, Okla.; Eric Sandvol, University of Missouri, Columbia, Mo.; Omer Emre, MTA, Ankara, Turkey

Different research groups have been studying neotectonics and earthquake potential of major tectonic features of different portions of the eastern Mediterranean region. This session plans to provide a formal discussion on problems related to neotectonics of the region. ORAL and POSTER

Q. On What Fossilized Creature Would You Find a Pygidium?

Like trivia? Get a team together and battle it out during GSA's first Geoscience Trivia Night at the GSA Annual Meeting in Denver!

GEOSCIENCE TRIVIA NIGHT
Tuesday, November 9, 2004
8–10 p.m.
(Location to be announced.)

Put your knowledge to the test in this competition with your peers and friends on more than 100 geoscience trivia questions.

For more information and team registration, e-mail Gary Lewis at glewis@geosociety.org.

Answer: Trilobite

CALL FOR PAPERS

T93. Crustal Seismic Anisotropy as a Measure of Regional Tectonic Deformation (Posters)

GSA Geophysics Division; GSA Structural Geology and Tectonics Division

Geophysics/Tectonophysics/Seismology; Tectonics; Structural Geology

David Okaya, University of Southern California, Los Angeles, Calif.; Nikolas Christensen, University of Wisconsin, Madison, Wis.

This session explores how crustal seismic anisotropy may serve as a proxy for intracrustal deformation by combining tectonic formation and regional distributions of shear and metamorphic fabrics, anisotropic material properties, and observations of seismic waves. POSTER

T94. Geoinformatics and Geological Sciences: The Next Step (Posters)

GSA Geophysics Division

Geophysics/Tectonophysics/Seismology; Tectonics; Geoscience Information/Communication

Ramon Arrowsmith, Arizona State University, Tempe, Ariz.; Charles Meertens, UNAVCO, Inc., Boulder, Colo.

Present results of geoinformatics projects in the geoscience community, in particular from those associated with distributed data and computational resource integration efforts. Explore areas where information technology developments can address geoscience problems. POSTER

T95. Differentiating Climatic from Tectonic Controls on Landscape Evolution (Posters)

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

Quaternary Geology/Geomorphology; Tectonics; Structural Geology

Claudia J. Lewis, Los Alamos National Lab, Los Alamos, N.Mex.; Eric V. McDonald, Desert Research Institute, Reno, Nev.; John Gosse, Dalhousie University, Halifax, Nova Scotia

Dynamic response of mountainous landscapes to climate-driven denudation bedevils determination of tectonic uplift. We seek papers that quantify landscape and lithospheric responses to climatic and tectonic forcing in active orogens and mountain belts undergoing postorogenic exhumation. POSTER

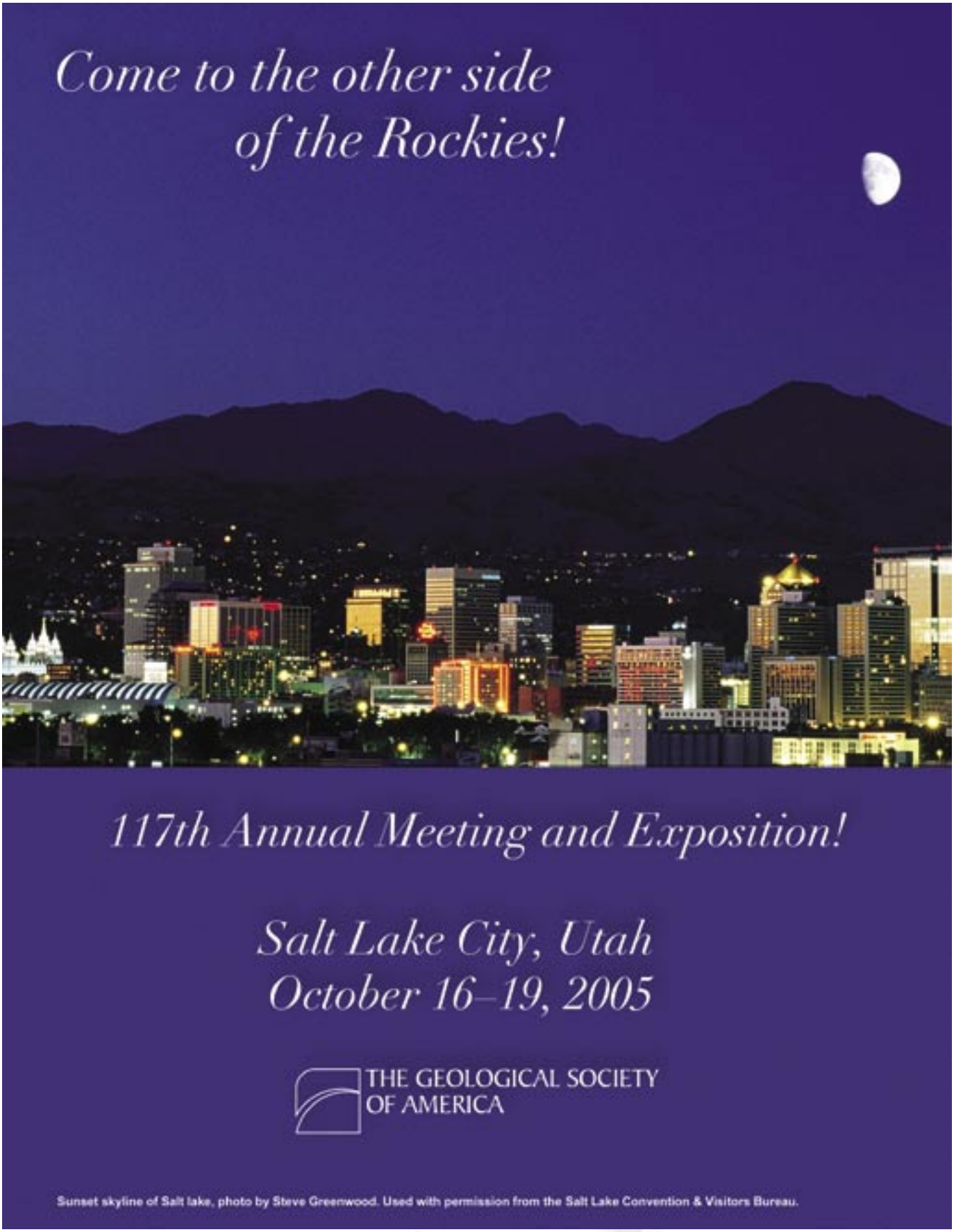
T96. Records of Late Quaternary Climatic Change from the Americas: Interhemispheric Synchroneity or Not

GSA Quaternary Geology and Geomorphology Division

Quaternary Geology/Geomorphology; Paleoclimatology/Paleoceanography

Donald T. Rodbell, Union College, Schenectady, N.Y.; John T. Andrews, University of Colorado, Boulder, Colo.; Geoffrey O. Seltzer, Syracuse University, Syracuse, N.Y.

We seek papers that review high-resolution physical, chemical, and biological archives of climate change during the past ~30,000 years from the Americas, and also including Antarctica and Greenland. Our focus is mainly on terrestrial evidence,



Sunset skyline of Salt lake, photo by Steve Greenwood. Used with permission from the Salt Lake Convention & Visitors Bureau.

but we also welcome near-shore marine records that directly record terrestrial events. ORAL and POSTER

T97. Geologic History and Processes of the Colorado River

GSA Quaternary Geology and Geomorphology Division

Quaternary Geology/Geomorphology; Environmental Geoscience; Stratigraphy

Keith A. Howard, U.S. Geological Survey, Menlo Park, Calif.; Cassandra Fenton, Tucson, Ariz.

The history of the Southwest's Colorado River has intrigued scientists and the public for over a century. This session will explore Cenozoic geologic history and processes of the river from the Rockies to Mexico. ORAL and POSTER

T98. Evolution of the Great Plains Landscape

GSA Quaternary Geology and Geomorphology Division

Quaternary Geology/Geomorphology

Joseph A. Mason, University of Wisconsin, Madison, Wis.; James B. Swinehart, School of Natural Resources, Lincoln, Nebr.; J. Elmo Rawling, University of Wisconsin, Platteville, Wis.

This session will highlight research on late Cenozoic landscape evolution of the Great Plains. Topics will include rates and causes of stream incision, drainage network development, and the evolution of tablelands, badlands, dunefields, and playas. ORAL and POSTER

T99. The Midwest from Deglaciation to Settlement

GSA Quaternary Geology and Geomorphology Division

Quaternary Geology/Geomorphology; Paleoclimatology/Paleoceanography; Limnogeology

Kathy J. Licht, Indiana University–Purdue University Indianapolis, Indianapolis, Ind.; Tom Lowell, University of Cincinnati, Cincinnati, Ohio

This interdisciplinary session will explore the landscape impacts of deglaciation, the postglacial transition and Holocene environments from the prairie-woodland boundary to the Appalachians. Investigations of lacustrine, loess, fluvial, and vegetation records are welcome. ORAL

T100. Glacial Outburst Floods: Causes and Consequences

GSA Quaternary Geology and Geomorphology Division

Quaternary Geology/Geomorphology

Amir Mokhtari Fard, Stockholm University, Stockholm, Sweden

This session would consider the less-explored causes and consequences of sudden and catastrophic events of release of large volumes of melt water from a glacier or glacier-dammed lake. ORAL

T101. The Red River Raft of Louisiana

GSA Quaternary Geology and Geomorphology Division

Quaternary Geology/Geomorphology; Engineering Geology; Hydrogeology

Nalini Torres, U.S. Army Corps of Engineers, Vicksburg, Miss.; Danny W. Harrelson, U.S. Army Engineer Research and Development Center, Vicksburg, Miss.

This is a review and description of the historic and current geomorphic evolution of the Red River to the development and removal of the raft. ORAL

T102. Quaternary Paleoenvironments of the Middle East: Proxy Records, Human Prehistory, and Regional Cross-Correlation

GSA Archaeological Geology Division; GSA Quaternary Geology and Geomorphology Division

Quaternary Geology/Geomorphology; Archaeological Geology; Paleoclimatology/Paleoceanography

Carlos E. Cordova, Oklahoma State University, Stillwater, Okla.; Caroline Davies, University of Missouri, Kansas City, Mo.

This session will bring together Quaternary geoscientists and geoarchaeologists working in Middle Eastern countries to present and discuss paleoenvironmental records, and their application to issues of climate change chronologies, human prehistory, and regional geomorphological evolution. ORAL

T103. Documenting the Geomorphic and Ecosystem Evolution of National Park Landscapes Using Repeat Photography

GSA Quaternary Geology and Geomorphology Division; National Park Service, Natural Resources Program Center, Geologic Resources Division

Quaternary Geology/Geomorphology; Environmental Geoscience; Remote Sensing/Geographic Information System

Harold S. Pranger, Denver, Colo.

Repeat photographs often clearly document recent historic changes to native and disturbed landscapes. National Parks are ideal locations for using repeat photographs to understand natural and anthropogenic changes to geomorphic and ecological systems. ORAL and POSTER

T104. Unveiling the Hidden Components in Archaeological Landscapes—The Role of Geoscience Techniques in Archaeological Site Analysis

GSA Archaeological Geology Division

Archaeological Geology; Quaternary Geology/Geomorphology; Environmental Geoscience

Cynthia A. Stiles, University of Wisconsin, Madison, Wis.

A forum for research emphasizing integration of physical and geochemical techniques used in the geosciences field with archaeological studies to gain a better understanding of the interactive role humans have had with their environment. ORAL and POSTER

T105. Archaeological Geology of Stratigraphically Complex Localities

GSA Archaeological Geology Division

Archaeological Geology; Quaternary Geology/Geomorphology; Sediments, Clastic

E.A. Bettis III, University of Iowa, Iowa City, Iowa

Stratigraphically complex localities contain some of the most complete and important archaeological records on Earth. This session addresses the interpretation of the complex array of

sedimentological, pedological, biological, and human factors that interact to form these records. ORAL

T106. Geological Context of Early Humans from Ethiopian Rift Basins

GSA Archaeological Geology Division; GSA Sedimentary Geology Division; GSA Limnogeology Division

Archaeological Geology; Stratigraphy; Paleontology/Paleobotany

Jay Quade, University of Arizona, Tucson, Ariz.; Jonathon Wynn, University of Oregon, Eugene, Ore.

Basin deposits in the Ethiopian rift are the richest source of fossil hominins in the world. This session will bring together recent research by expedition geologists on the geological context of these finds. ORAL

T107. Toward Effective Interdisciplinary Education in Archaeological Geology: Progress and Prospects

GSA Archaeological Geology Division; GSA Geoscience Education Division

Archaeological Geology; Geoscience Education; Quaternary Geology/Geomorphology

Jennifer R. Smith, Washington University, St. Louis, Mo.

Educators and geoscience professionals share their perspectives on the "ideal" training for archaeological geologists and on overcoming the particular philosophical and bureaucratic challenges of developing interdisciplinary curricula at the graduate and undergraduate levels. ORAL

T108. Geoarchaeology, Geoconservation, and Georesources: Integrated Approaches to Investigating, Conserving, and Managing Past and Present Landscapes

GSA Archaeological Geology Division; GSA Quaternary Geology and Geomorphology Division; GSA Geology and Society Division; GSA Geology and Public Policy Committee

Environmental Geoscience; Archaeological Geology; Geoscience Education

Jasper Knight, Loughborough University, Loughborough, United Kingdom

This session explores relationships between geology, geomorphology, human activity and landscape, and implications for management and conservation of landscape resources. Methodological and field-based papers using mapping, stratigraphic analysis, dating, geographic information system, and modeling are all invited. ORAL and POSTER

T109. Geology, Decisionmakers, and the Public: Challenges in Communication

GSA Geology and Society Division; GSA Geology and Public Policy Committee

Public Policy; Environmental Geoscience; Geoscience Information/Communication

Thomas J. Evans, University of Wisconsin—Extension, Madison, Wis.; John Kiefer, Kentucky Geological Survey, Lexington, Ky.

The engagement of geology in public policy relies upon effective communication. This session will focus on examples of successful and unsuccessful communication experiences. Both invited and volunteered presentations will be included. ORAL

T110. Information Technology Initiatives in the Geosciences: Policy, Strategy, and Management Issues

Geoscience Information/Communication; Public Policy; Geoscience Education

Soumava Adhya, University at Albany, SUNY, Albany, N.Y.

This session focuses on the experiences of the geosciences community regarding barriers and enablers to adoption and implementation of emerging information technologies, particularly on knowledge about and experiences with policy, strategy, and management. ORAL

T111. Geoscience Information and Librarianship in a Global Context

Geoscience Information Society

Geoscience Information/Communication; Geoscience Education

Linda R. Musser, Pennsylvania State University, University Park, Pa.

As geoscience becomes more global in scope, the tools librarians provide must also adapt. How well have traditional tools and processes changed to meet these new demands? What changes still need to be made? ORAL and POSTER

T112. Geologic Time and CHRONOS: Databases, Tools, Outreach, Education, and the Geoinformatics Revolution

Geoscience Information Society; Paleontological Society; CHRONOS

Geoscience Information/Communication; Stratigraphy; Geoscience Education

Cinzia Cervato, Iowa State University, Ames, Iowa; Walter S. Snyder, National Science Foundation, Arlington, Va.

Talks and posters will present results from the efforts of the geoinformatics community on database and data networking projects, demonstrate analytical and visualization tools, and illustrate community involvement and educational activities related to Earth's history. ORAL and POSTER

T113. Geology in the National Forests—Stewardship, Education, and Research

USDA Forest Service, Minerals and Geology Management Program

Geoscience Information/Communication; Environmental Geoscience; Geoscience Education

Joe T. Gurrieri, USDA Forest Service, Butte, Mont.; Andrew H. Rorick, USDA Forest Service, Sandy, Ore.; Jim Gauthier-Warinner, USDA Forest Service, Arlington, Va.

This session will explore some of the many aspects of geology conducted on the National Forests. Topics include paleontology, cave and karst geology, engineering geology and natural-hazard mitigation, hydrogeology, interpretive and recreational geology, geoecology, and more. ORAL

T114. Geology in the National Parks: Research, Mapping, and Resource Management

National Park Service

Geoscience Information/Communication; Paleontology/Paleobotany; Marine/Coastal Science

Bruce A. Heise, National Park Service, Geologic Resources Division, Lakewood, Colo.; Tim Connors, National Park Service, Denver, Colo.; Rebecca Beavers, National Park Service, Denver, Colo.; Greg McDonald, National Park Service, Lakewood, Colo.; Jeff Mow, Florissant Fossil Beds National Monument, Florissant, Colo.

This session will address the role of geoscience in the National Parks. Presentations are invited on geologic research, geologic mapping, paleontology, shoreline geology, and resource management in National Parks, Monuments, Seashores, and Historic Sites. ORAL

T115. The Keys to Opportunities with the National Park Service

National Park Service; Geological Society of America; American Geological Institute; Association for Women Geoscientists

Public Policy; Geoscience Information/Communication; Geoscience Education

Judy Geniac, Denver, Colo.; Gary Lewis, GSA Education and Outreach, Boulder, Colo.; Ann Beenbow, Alexandria, Va.; Marguerite Toscano

Discover the growing number of geoscience opportunities in national parks for professors, students, retirees, organizations, universities, and companies. Examine and discuss existing partnerships and access to research, programs, projects, and volunteer and paid positions. ORAL

T116. Geology for the Masses: Engaging the Public through Informal Geoscience Education in Parks, Monuments, Open Spaces, and Public Lands

GSA Geoscience Education Division; National Park Service; Bureau of Land Management; Association of Earth Science Editors

Geoscience Education; Geoscience Information/Communication; Environmental Geoscience

Jim Wood, National Park Service, Denver, Colo.; Allyson Mathis, National Park Service, Grand Canyon, Ariz.; Marion Malinowski, Bureau of Land Management, Lakewood, Colo.; Carol Ruthven, Association of Earth Science Editors, Lexington, Ky.; Monica Gaiswinkler Easton, Ministry of Northern Development and Mines, Sudbury, Ontario

This session will explore programs and products (e.g., displays, publications, signs, Web sites, virtual and real field trips) for effective informal science education about the geology of parks, monuments, open spaces, and public lands. ORAL and POSTER

T117. Innovative Approaches to Teaching "Geology of National Parks": Tales from the Classroom, Field, Page, Web, and Beyond

GSA Geoscience Education Division; National Association of Geoscience Teachers

Geoscience Education; Geoscience Information/Communication

Robert J. Lillie, Oregon State University, Corvallis, Ore.; Carol J. Ormand, Wittenberg University, Springfield, Ohio; Joseph F. Reese, Edinboro University of Pennsylvania, Edinboro, Pa.

This session will bring together those who teach geology by using examples from National Parks to share their expertise, exercises, written and electronic resources, techniques, and strategies for successfully educating students on park geology. ORAL

T118. The Science of Sustainability: How Can We Most Effectively Educate Students, the Public, and Policymakers?

Critical Issues Caucus, GSA Geology and Public Policy Committee

Geoscience Education; Environmental Geoscience; Public Policy

Paul H. Reitan, SUNY at Buffalo, Buffalo, N.Y.; Christine V. McLelland, GSA Education and Outreach, Boulder, Colo.

Public understanding about the role of earth systems is central to a sustainable future. We have a special obligation to communicate this effectively in schools and for the public and policymakers. How can we do this? ORAL

T119. Sigma Gamma Epsilon Student Research (Posters)

Sigma Gamma Epsilon

Environmental Geoscience

Donald W. Neal, East Carolina University, Greenville, N.C.; Charles Mankin, Oklahoma Geological Survey, Norman, Okla.

All students are welcome to present their research in any area of geology. POSTER

T120. Integrative Interdisciplinary Undergraduate Research in the Earth Sciences (Posters)

Council on Undergraduate Research—Geosciences Division

Geoscience Education

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

This session highlights examples of research involving undergraduates that straddles traditional disciplinary boundaries both within and beyond the earth sciences. Presentations should concentrate on the process of doing such research including the challenges and rewards. POSTER

T121. Involvement of Undergraduates in Geological Research: Critical Tools for Background Enrichment (Posters)

GSA Geoscience Education Division

Geoscience Education

Nazrul I. Khandaker, York College of CUNY, New York, N.Y.

This session invites posters on geological/environmental topics involving field, computer-assisted, and laboratory-oriented investigations. Topics may include a wide spectrum of various geological and environmental aspects. Student participation should be dominant. Undergraduate and K–12 students are encouraged to submit abstracts. POSTER

T122. Inspiring First-rate Research through Undergraduate Teaching: A Special Session in Honor of John B. Reid Jr.

National Association of Geoscience Teachers; GSA Quaternary Geology and Geomorphology Division

Quaternary Geology/Geomorphology; Petrology, Igneous; Geoscience Education

Eric J. Steig, University of Washington, Seattle, Wash.; John Eichelberger, University of Alaska, Fairbanks, Alaska; Daniel P. Murray, University of Rhode Island, Kingston, R.I.

This session will explore ways in which students at any level (K–12 through graduate) have been engaged in the research process, whether through innovative inquiry-based teaching methods, access to equipment, interaction with more advanced students, or simply through excellent mentoring. ORAL

T123. Teaching Structural Geology in the 21st Century

GSA Structural Geology and Tectonics Division; National Association of Geoscience Teachers; On the Cutting Edge

Geoscience Education; Structural Geology

Barbara Tewksbury, Hamilton College, Clinton, N.Y.; Robert Burger, Smith College, Northampton, Mass.; Jan Tullis, Brown University, Providence, R.I.; Michael Williams, University of Massachusetts, Amherst, Mass.

We invite abstracts that showcase effective methods of teaching structural geology in the classroom, laboratory, and field. This session will also present outcomes from the 2004 workshop, Teaching Structural Geology in the 21st Century (http://dlesecommunity.carleton.edu/NAGTWorkshops/structure04/index.html). ORAL and POSTER

T124. Using Field Observations and Field Experiences to Teach Geoscience: An Illustrated Community Discussion (Posters)

National Association of Geoscience Teachers; GSA Education Division

Geoscience Education

David W. Mogk, Montana State University, Bozeman, Mont.; Cathryn A. Manduca, Carleton College, Northfield, Minn.; Barbara Tewksbury, Hamilton College, Clinton, N.Y.

Presentations will demonstrate ways that field observations and experiences can be used to enhance students' understanding of geoscience. Contributions can document both successful teaching practice and potential use of field research to enhancing students' learning. POSTER

T125. Using Digital Geological Maps to Build Deeper Understanding of Earth Science Relationships (Posters)

Geoscience Education; Geoscience Information/Communication

Andrew H. Wulff, Western Kentucky University, Bowling Green, Ky.

This session will focus on the use of digital geological maps; specifically how to make these interactive data sets more accessible and how their use may facilitate the deeper understanding of geological relationships. POSTER

T126. Teaching Geology and Human Health: Expanding the Curriculum

National Association of Geoscience Teachers; GSA Geoscience Education Division

Geoscience Education

Jean M. Bahr, University of Wisconsin, Madison, Wis.; H. Catherine W. Skinner, Yale University, New Haven, Conn.; Jill K. Singer, SUNY—College at Buffalo, Buffalo, N.Y.

This session is designed to provide an opportunity for those involved in development of course materials linking geology and human health to share instructional practices and case studies across the geoscience curriculum. ORAL and POSTER

T127. STEMS: Science Teaching Enhanced with Museums and Surveys

GSA Geoscience Education Division; National Association of Geoscience Teachers

Geoscience Education

Sarah D. Zellers, Central Missouri State University, Warrensburg, Mo.; Ann Molineux, University of Texas, Austin, Texas

Museums, state and national surveys, and departments have scientists, data and collections to enhance educational opportunities. This session will showcase outreach and curriculum design utilizing collections, data, and scientific expertise to complement earth science education. ORAL and POSTER

T128. Integration of Geoscience into Programs of Integrated Science and Math

GSA Engineering Geology Division; GSA Geoscience Education Division

Geoscience Education; Environmental Geoscience; Engineering Geology

John D. Rockaway, Northern Kentucky University, Highland Heights, Ky.; Denice N. Robertson, Northern Kentucky University, Highland Heights, Ky.

Presentations discussing the incorporation of geoscience into programs integrating science and math for the purpose of introducing students to the sciences and for encouraging them to think outside their nonscience disciplines. ORAL

T129. Innovative and Unique Advanced Geology/ Geoscience Courses at the K–12 Level

GSA Geoscience Education Division; National Association of Geoscience Teachers

Geoscience Education; Geoscience Information/Communication

Steve Kluge, Fox Lane High School, Bedford, N.Y.

Session features presentations by K–12 teachers of advanced geology/geoscience courses. Presenters will highlight those aspects of their courses that make them unique and discuss affiliations with colleges/organizations that lend legitimacy to their programs. ORAL

T130. Authentic Research Collaborations: Bringing Scientific Researchers, K–12 Schools, and Other Community Groups Together in the Scientific Endeavor

GSA Geoscience Education Division; National Association of Geoscience Teachers

Geoscience Education

William Slattery, Wright State University, Dayton, Ohio; Dave Mayo, California State University, Los Angeles, Los Angeles, Calif.

This session will highlight the efforts of scientific researchers, K–12 educators and other community groups participating as partners in authentic collaborative research. The topic will be explored from the perspectives of those different groups. ORAL

T131. Online Geoscience Education at Two-Year Colleges: Hybrid or Strictly Distance Learning Instruction for Nontraditional Students

GSA Geoscience Education Division

Geoscience Education; Geoscience Information/ Communication; Remote Sensing/Geographic Information System

Suzanne G. Traub-Metlay, Front Range Community College, Boulder County Campus, Longmont, Colo.

How do online geoscience educators provide meaningful field or laboratory experiences for college students who do not report to a classroom? Online instructors can successfully teach adults about earth science and related topics—learn how! ORAL

T132. Why Earth Science Curriculum: National Science Foundation–Funded Projects for Improving Earth Science Education

GSA Geoscience Education Division; American Geological Institute, National Science Foundation

Geoscience Education

Roderic Brame, American Geological Institute, Alexandria, Va.; Michael Smith, American Geological Institute, Alexandria, Va.

Geoscience educators and curriculum developers are taking critical steps for improving earth science education in all academic levels with support of the National Science Foundation. Curriculum has been developed and implemented to build science literacy across the nation. POSTER

T133. Current Research on Situated Teaching and Learning in Geoscience: Field-Based, Case-Based, Problem-Based, Place-Based

National Association of Geoscience Teachers; GSA Geoscience Education Division

Geoscience Education; Geoscience Information/ Communication; Public Policy

Steven Semken, Arizona State University, Tempe, Ariz.; Eric Riggs, San Diego State University, San Diego, Calif.

Situated teaching methods are thought to improve learning in geoscience, enhancing relevance and context by building on the physical locality and local culture, events, and problems. This session features quantitative and qualitative research into the theory and effectiveness of these methods. ORAL and POSTER

T134. We Can Do Better: Alternatives to the Same Old Lab-Lecture Format in the College Classroom

GSA Geoscience Education Division; National Association of Geoscience Teachers

Geoscience Education

Elizabeth M. King, Illinois State University, Normal, Ill.; Dexter Perkins, University of North Dakota, Grand Forks, N.Dak.

During the past decade, it has become increasingly clear that there are many excellent alternatives to the standard lab-lecture format used by most college science teachers. This session will provide a chance to share innovations in teaching style. ORAL and POSTER

T135. Improving Delivery in Geoscience Education (IDIG): A Session Celebrating Dorothy LaLonde Stout

National Association of Geoscience Teachers; GSA Geoscience Education Division

Geoscience Education; Public Policy

Marilyn J. Suiter, National Science Foundation, Arlington, Va.; Phillip R. Romig Jr., Colorado School of Mines, Golden, Colo.

In this session, IDIG participants/associates will present the outcomes of their implemented plans for improving the delivery of geoscience education. The session goal is to share and disseminate the practices IDIG educators have found effective. ORAL

T136. Electronic Student Response Technology in the Geoscience Classroom: Is it a Valuable Teaching and Learning Tool?

National Association of Geoscience Teachers; GSA Geoscience Education Division

Geoscience Education

Lisa Greer, Washington and Lee University, Lexington, Va.; Peter J. Heaney, Pennsylvania State University, University Park, Pa.

Electronic student response technology has been cited as a method for overcoming barriers to engagement and effective learning in the classroom. This session will explore the implementation and assessment of SRT in the geoscience classroom. ORAL

GSA EMPLOYMENT SERVICE

GSA will again offer its Employment Interview Service, which matches employers with job seekers during three days of onsite interviews. Each year, this program, together with the Careers Roundtable Discussions (see page 44), provides valuable networking opportunities across all applied and academic areas of the geosciences.

For more information, see www.geosociety.org/profdev/empsvc1.htm, or e-mail membership@geosociety.org.

T137. Minorities, Women, and Persons with Disabilities in the Geosciences: Continuing Issues and Innovative Solutions

GSA Geoscience Education Division; GSA Committee on Minorities and Women in the Geosciences

Geoscience Education; Public Policy; Geoscience Information/Communication

Maya Elrick, University of New Mexico, Albuquerque, N.Mex.; Marc Carrasco, University of California, Berkeley, Calif.; John William Pennington, Oregon State University, Corvallis, Ore.; Cassandra Runyon, College of Charleston, Charleston, S.C.

This session will address the current issues confronting minorities, women, and persons with disabilities in the geosciences and explore new and existing ideas and programs that seek to attract and retain members of these underrepresented groups. ORAL and POSTER

T138. New Methods and Technologies in Teaching Geology to Nontraditional and Disabled Students—The Aspects of Change to Incorporate Technology and Hands-On Methods

GSA Geoscience Education Division

Geoscience Education; Geoscience Information/Communication; History of Geology

Mark Howe, Arizona State University, Tempe, Ariz.; Connie Gibb, University of Nebraska, Lincoln, Nebr.

The geological sciences are heavy in math, physics, chemistry, and procedures. Today, more older, nontraditional and disabled people are taking courses in the sciences. This session focuses on the "geoteaching" and the processes that entail. ORAL and POSTER

T139. Geoscience Education Strategies and Methods that Encourage ALL Students (Especially Students with Disabilities) to Participate in the Geosciences

GSA Geoscience Education Division; National Science Foundation; National Aeronautics and Space Administration

Geoscience Education

Roderic Brame, American Geological Institute, Alexandria, Va.; Wendi Williams, University of Arkansas at Little Rock, Little Rock, Ark.

Geoscience educators with support of the National Science Foundation are on the forefront of inclusion and accessibility in science. This session will highlight advances in accessibility and the impact it is having on the geoscience education community. ORAL

T140. Beyond Video Games—Promoting Active Learning for All Students

Geoscience Education

Terry L. Oroszi, Biological Sciences, Wright State University, Dayton, Ohio; Heidi J. Turner, CLASS—Wright State University, Dayton, Ohio

A selection of science activities designed for the participation of ALL students is solicited. Available technologies/equipment that encourage active learning from students with disabilities will be discussed. ORAL

T141. Building a Digital Library that Supports Diversity: Goals, Lessons Learned, and Future Directions

National Association of Geoscience Teachers; Geoscience Information Society; GSA Geoscience Education Division

Geoscience Education; Geoscience Information/Communication; Public Policy

Mary R. Marlino, University Corporation for Atmospheric Research (UCAR), Boulder, Colo.; Rajul E. Pandya, UCAR, Boulder, Colo.

The session will explore current and ongoing efforts to promote diversity in the Digital Library for Earth System Education (DLESE), focusing on early successes, lessons learned, and strategies for moving the library forward. ORAL and POSTER

T142. Building Strong Geoscience Departments: Opportunities, Successes, and Challenges

National Association of Geoscience Teachers; GSA Geoscience Education Division

Geoscience Education

R. Heather Macdonald, College of William and Mary, Williamsburg, Va.; Cathryn A. Manduca, Carleton College, Northfield, Minn.; Randall M. Richardson, University of Arizona, Tucson, Ariz.

This session seeks examples of successful departmental activities or discussions of critical issues facing departments in undergraduate and/or graduate curriculum; recruiting, retaining, and advising students, retaining faculty, integrating research and education, and/or departmental planning. ORAL and POSTER

T143 Pre-Mesozoic Impacts: Their Effect on Ocean Geochemistry, Magnetic Polarity, Climate Change, and Organic Evolution (Posters)

GSA Planetary Geology Division; Paleontological Society

Planetary Geology; Paleontology/Paleobotany; Paleoclimatology/Paleoceanography

Charles A. Sandberg, U.S. Geological Survey, Denver, Colo.; Jared R. Morrow, University of Northern Colorado, Greeley, Colo.; Christian Koeberl, University of Vienna, Vienna, Austria

Pre-Mesozoic comet and meteorite impacts produced extreme oceanic and climate changes, causing mass extinctions followed by rapid radiation of surviving organisms. Thus, they were the driving mechanism in the early evolution of life on Earth. POSTER

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. 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 Information 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, freestanding 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. Speakers must be at their poster booths 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 the abstract body to 2,000 characters or fewer. The online abstract system will reject it if it exceeds this limit.

You can include a table with your abstract, 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, after pasting, or while typing).

Abstracts Fee

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

You May Present Only One 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 Early August

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

Abstracts Deadline: July 13

DENVER 2004 FIELD TRIPS

Come experience the Rockies! The 2004 GSA Annual Meeting in Denver will provide abundant opportunities for field trips viewing the geology of the southern Rocky Mountains. A full array of trips will be offered, ranging from multi-day excursions delving into the tectonic development of northern New Mexico to one-day trips visiting Dinosaur Ridge. These trips will minimize the impact of possible Rocky Mountain snowstorms by emphasizing one-day trips in the eastern slope of the Rockies and multi-day trips to southern locations with warmer and dryer weather. Some trips will be unaffected by inclement weather: underground, the cool temperatures of the Henderson Mine are constant regardless of the weather and the heat from underground coal fires can be quite pleasant when combined with a little Rocky Mountain powder snow. If a blizzard requires that GSA cancel a field trip, we will return your field trip fee and provide information on the abundant in-town opportunities for exploration, from the Denver Museum of Nature & Science to the Wynkoop Brewery, which was cofounded by geologist John Hickenlooper, the current mayor of Denver.

Most trips will start and end in Denver. Air travel plans that include a Saturday night stay over 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.

The field trip co-chairs for the Denver 2004 meeting are Eric Erslev, Department of Geosciences at Colorado State University, and Eric Nelson, Department of Geology and Geological Engineering at Colorado School of Mines. For more information about the trips, please contact the field trip leader or Eric Erslev, Department of Geosciences, Colorado State University, Fort Collins, CO 80523, (970) 491-5661, fax 970-491-6307, erslev@cnr.colostate.edu.

PREMEETING FIELD TRIPS

Navajo Sand Sea of Near-Equatorial Pangea: Tropical Westerlies, Slumps, and Giant Stromatolites

Tues.–Sat., Nov. 2–6. David Loope, Dept. of Geosciences, University of Nebraska, Lincoln, NE 68508, (402) 472-2647, fax 402-472-4917, dloope1@unl.edu; Len Eisenberg; Erik Waiss. Max.: 15. Cost: $475.

Strike-Slip Tectonics and Thermochronology of Northern New Mexico

Thurs.–Sat., Nov. 4–6. Eric Erslev, Dept. of Geosciences, Colorado State University, Fort Collins, CO 80523, (970) 491-5661, fax 970-491-6307, erslev@cnr.colostate.edu; Steven Cather; Seth Fankhauser; Matt Heizler; Rob Sanders. Max.: 40. Cost: $255. *Begins and ends in Denver or Santa Fe, New Mexico.*

Geology of the Silvercliff–Rosita Hills Mining District and Spanish Peaks Area

Fri. and Sat., Nov. 5–6. Cosponsored by *GSA Sedimentary Geology Division*. Paul R. Krutak, P. Krutak Geoservices International, P.O. Box 369, 2118 Main Street, Rye, CO 81069-0369, (719) 489-2282 (phone and fax), pkrutakgeos@hotmail.com; John R. Barwin; Marty Horn. Max.: 36. Cost: $185.

Hyperpycnal Wave-Modified Turbidites of the Pennsylvanian Minturn Formation, North-Central Colorado.

Fri. and Sat., Nov. 5–6. Paul M. Myrow, Dept. of Geology, Colorado College, Colorado Springs, CO 80903, (719) 389-6789, fax 719-389-6910, pmyrow@coloradocollege.edu; Karen Houck; Charles Kluth; Michael Lamb; Claire Lukens; Jeff Parsons. Max.: 36. Cost: $155.

Structural Implications of Underground Coal Mining in the Mesaverde Group, Somerset Coal Field, Delta and Gunnison Counties, Colorado

Fri. and Sat., Nov. 5–6. Christopher J. Carroll, Colorado Geological Survey, 1313 Sherman St., Room 715, Denver, CO 80203, (303) 866-3501, fax 303-866-2461, Chris.Carroll@state.co.us; Greg Hunt; Wendell Koontz; Eric Robeck. Max.: 20. Cost: $240.

A New K-T Boundary in the Denver Basin

Sat., Nov. 6. Kirk Johnson, Denver Museum of Nature & Science, 2001 Colorado Blvd., Denver, CO 80205-5732, (303) 370-6448, fax 303-331-6492, kjohnson@dmns.org; Richard Barclay. Max.: 45. Cost: $105.

Buried Paleo-Indian Landscapes and Sites in the High Plains of Northwestern Kansas and Eastern Colorado

Sat., Nov. 6. Cosponsored by the *GSA Archaeological Geology Division*. Rolfe D. Mandel, Kansas Geological Survey, 1930 Constant Avenue, Lawrence, KS 66047-3726, (785) 864-2171, fax 785-864-5317, mandel@kgs.ku.edu; Jack Hofman; Steve Holen. Max.: 36. Cost: $85.

Colorado Front Range—Anatomy of a Laramide Uplift

Sat., Nov. 6. Karl Kellogg, U.S. Geological Survey, P.O. Box 25046, Denver Federal Center, Denver, CO 80225, (303) 236-1305, fax 303-236-0214, kkellogg@usgs.gov; Bruce Bryant; Jack Reed. Max.: 36. Cost: $100.

Continental Accretion—Colorado Style: Proterozoic Island Arcs and Back Arcs of the Central Front Range

Sat., Nov. 6. Lisa R. Lytle, Dept. of Geology and Geological Engineering, Colorado School of Mines, Golden, CO 80401-1887, (303) 478-9427, fax 303-273-3859, lfiniol@mines.edu; Thomas R. Fisher. Max.: 36. Cost: $90.

Eco-Geo-Hike along the Dakota Hogback North of Boulder, Colorado

Sat., Nov. 6. Peter Birkeland, Dept. Geological Sciences (retired), University of Colorado, Boulder, CO 80309, birkelap@colorado.edu; Ven Barclay; Edwin Larson; Ralph Shroba. Max.: 20. Cost: $45. *Begins and ends in Boulder.*

Geological Reconnaissance of Dinosaur Ridge, Red Rocks, and Front Range of the Rocky Mountains near Morrison, Colorado

Sat., Nov. 6. Norbert E. Cygan, Friends of Dinosaur Ridge, 16831 W. Alameda Parkway, Morrison, CO 80456, (303) 697-3466, fax 303-697-8911, necygan@aol.com; T. Caneer; Harald Drewes and other volunteers from Dinosaur Ridge, www.dinoridge.org. Max.: 45. Cost: $90. *Also offered as post-meeting trip.*

Glenwood Springs, Colorado Coal Fire—Observations, Discussion, and Field Data Collection Techniques

Sat., Nov. 6. Glenn B. Stracher, Dept. of Science and Mathematics, East Georgia College, Swinsboro, GA 30401; (478) 289-2073, fax 478-289-2080, stracher@ega.edu; Gary Colaizzi; Steve Renner; Janet L. Stracher; Tammy P. Taylor. Max.: 45. Cost: $105.

Overview of Laramide Structures along the Northeastern Flank of the Front Range

Sat., Nov. 6. Vince Matthews, Colorado Geological Survey, 1313 Sherman St., Room 715, Denver, CO 80203, (303) 866-3028, fax 303-866-2461, vince.matthews@state.com.us. Max.: 38. Cost: $120.

Paleoclimate, Paleohydrology, and Paleoecology of the Morrison Formation in the Front Range of Colorado

Sat., Nov. 6. Stan Dunagan, Dept. of Geology, Geography & Physics, University of Tennessee, Martin, TN 38238, (731) 587-7959, fax 731-587-1044, sdunagan@utm.edu; Christine Turner; Fred Peterson; Tim Demko. Max.: 30. Cost: $105.

Paleontology and Volcanic Setting of the Florissant Fossil Beds

Sat., Nov. 6. Herb Meyer, National Park Service, Florissant Fossil Beds National Monument, P.O. Box 185, Florissant, CO 80816, (719) 748-3253, fax 719-748-3253, herb_meyer @nps.gov; Steven Veatch. Max.: 36. Cost: $125.

Stratigraphy and Paleobiology of Mammoth Sites in the Denver Area

Sat., Nov. 6. Russ Graham, Denver Museum of Nature & Science, 2001 Colorado Blvd., Denver, CO 80205, (303) 370-6047, fax 303-331-6492, rgraham@dmns.org; Bart Weis; Jim Dixon. Max.: 36. Cost: $95.

HALF DAY—DURING THE MEETING

Tour of U.S. Geological Survey National Earthquake Information Center, Golden, Colorado

Wed., Nov. 10, 12:30–5 p.m. Peter J. Modreski, U.S. Geological Survey, MS 150, Box 25046, Denver Federal Center, Denver, CO 80225-0046, (303) 202-4766, fax 303-202-4767, pmodreski@usgs.gov; Lynn M. Highland; Pat Schassburger; Stephen J. Vandas; Lisa Ann Wald; Pamela J. Benfield; Waverly J. Person; Jill McCarthy. Max.: 45. Cost: $25.

POSTMEETING FIELD TRIPS

Upper Cambrian and Lower Ordovician Stratigraphy of West Texas and Southern New Mexico

Wed.–Sat., Nov. 10–13. John F. Taylor, Geoscience Dept., Indiana University of Pennsylvania, Indiana, PA 15705, (724) 357-4469, fax 724-357-5700, jftaylor@iup.edu; Raymond L. Ethington; James D. Loch; Paul R. Myrow; Robert L. Ripperdan. Max.: 20. Cost: $325. *Begins and ends in El Paso, Texas.*

Ancient Depositional Environments Control Modern Aquifer Quality: Stratigraphy of Groundwater Resources in the Denver Area

Thurs., Nov. 11. Robert G.H. Raynolds, Denver Museum of Nature & Science, 2001 Colorado Blvd., Denver, CO 80205, (303) 370-6047, fax 303-331-6492, denverbasin@dmns.org. Max.: 22. Cost: $110.

Cenozoic Geology and Fossils of the Pawnee Buttes Area, Northeast Colorado

Thurs., Nov. 11. Emmett Evanoff, Dept. of Geological Sciences, Campus Box 399, University of Colorado, Boulder, CO 80309-0399, (303) 444-2644 (phone and fax), emmettevanoff@ earthlink.net. Max.: 36. Cost: $85.

Consequences of Living with Geology: A Model Field Trip for the General Public

Thurs., Nov. 11. Cosponsored by *GSA Engineering Geology Division, GSA Geoscience Education Division, and American Institute of Professional Geologists.* David M. Abbott Jr., Consulting Geologist, 2266 Forest St., Denver, CO 80207, (303) 394-0321, fax 303-394-0543, dmageol@msn.com; David C. Noe. Max.: 40. Cost: $100.

Eldorado Canyon: Shorefront Property and Birthplace of Mountains

Thurs., Nov. 11. Lin Murphy, 3625 Catalpa Way, Boulder, CO 80304, (303) 447-0656, lin6@earthlink.net; Alan Lester. Max.: 36. Cost: $90.

Geological Reconnaissance of Dinosaur Ridge, Red Rocks, and Front Range of the Rocky Mountains near Morrison, Colorado

Thurs., Nov. 11. Norbert E. Cygan, Friends of Dinosaur Ridge, 16831 W. Alameda Parkway, Morrison, CO 80456, (303) 697-3466, fax 303-697-8911, necygan@aol.com; T. Caneer; Harald Drewes and other volunteers from Dinosaur Ridge, www.dinoridge.org. Max.: 45. Cost: $90. *Also offered as pre-meeting trip.*

Laramide Horizontal Shortening in the Rockies: Faulting and Folding in Oblique Backlimb-Tightening Structures of the Northeastern Flank of the Front Range, Colorado

Thurs., Nov. 11. Eric Erslev, Dept. of Geosciences, Colorado State University, Fort Collins, CO 80523, (970) 491-6375, fax 970-491-6307, erslev@cnr.colostate.edu. Max.: 24. Cost: $100.

Underground Tour of Henderson Molybdenum Mine

Thurs., Nov. 11. Eric Nelson, Dept. of Geology and Geological Engineering, Colorado School of Mines, Golden, CO 80401-1887, (303) 273-3811, fax 303-273-3859, enelson@mines.edu; Robert Golden; Jim Shannon. Max.: 15. Cost: $140.

Walking with Dinosaurs along Colorado's Front Range

Thurs., Nov. 11. Joanna Wright, Dept. of Geography and Environmental Sciences, University of Colorado, Denver, CO 80217-3363, (303) 556-6007, fax 303-556-6157, jwright@carbon.cudenver.edu. Max.: 36. Cost: $85.

DENVER 2004 SHORT COURSES

GSA-SPONSORED SHORT COURSES
STANDARD REGISTRATION DEADLINE: SEPTEMBER 30

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 see GSA's Web site, www.geosociety.org.

Evaporites: A Practical Approach

Fri. and Sat., Nov. 5–6. Cosponsored by *GSA Sedimentary Geology Division*. John Warren, University of Brunei Darussalam. Fee: $365. CEU: 1.6.

Introduction to Geographic Information Systems (GIS), Using ArcGIS9 for Geological Applications

Fri. and Sat., Nov. 5–6. Cosponsored by *GSA Geoscience Education Division* and *Environmental Systems Research Institute*. Ann B. Johnson and Dave Fosdek, ESRI, Denver. Fee: $240. CEU: 0.8.

Multi-Temporal Stereo Aerial Photography

Fri. and Sat., Nov. 5–6. Cosponsored by *GSA Engineering Geology Division* and *U.S. Army Corps of Engineers*. John C. Jens, U.S. Army Corps of Engineers, Alexandria, Va. Fee: $420. CEU: 1.6.

Calibrated Peer Review Training for Faculty and Teaching Assistants: Writing Exercises for Large and Small Classes without the Pile of Papers to Grade

Sat., Nov. 6. Cosponsored by *GSA Geoscience Education Division* and *National Association of Geoscience Teachers*. Elizabeth Heise, University of Texas at Brownsville, Brownsville, Texas; Cinzia Cervato, Iowa State University, Ames, Iowa; Amanda Palmer-Julson, Blinn College, Bryan, Texas. Fee: $340. CEU: 0.8.

Characterization and Toxicity Assessment of Mine-Waste Sites

Sat., Nov. 6. Cosponsored by *Geochemical Society of America*. Sharon Diehl, LaDonna Choate, David Fey, Phil Hageman, Bruce Smith, Kathy Smith, U.S. Geological Survey, Denver, Colo.; Jim Ranville, Tom Wildeman, Colorado School of Mines, Golden, Colo.; Jim Herron, Abandoned Mined Land Program. Fee: $300. CEU: 0.8.

Estimating Rates of Groundwater Recharge

Sat., Nov. 6. Cosponsored by *GSA Hydrogeology Division*. Rick Healy, U.S. Geological Survey, Denver, Colo.; Bridget Scanlon, University of Texas at Austin. Fee: $270. CEU: 0.8.

Hydrogeologic Field Methods

Sat., Nov. 6. Cosponsored by *GSA Hydrogeology Division*. John E. Moore, Consultant, Denver, Colo. Fee: $245. CEU: 0.8.

Management and Leadership Skills for Academic Administrators in the Geosciences

Sat., Nov. 6. Cosponsored by *GSA Geoscience Education Division* and *National Association of Geoscience Teachers*. Lee J. Suttner, Indiana University, Bloomington, Ind.; Sheila M. Moore, Training Concepts, Chattanooga, Tenn. Fee: $265. CEU: 0.8.

Practical Geoscience Ethics: Elements and Examples

Sat., Nov. 6. Cosponsored by *GSA Engineering Geology Division* and *American Institute of Professional Geologists*. David M. Abbott Jr., Consulting Geologist, Denver, Colo. Fee: $250. CEU: 0.8.

OTHER COURSES AND PANELS

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

Sequence Stratigraphy for Graduate Students

Fri. and Sat., Nov. 5–6. Free short course for graduate students. Cosponsored by *British Petroleum (BP)* and *ExxonMobil*. Instructors: Art Donovan (BP) and Kirt Campion (ExxonMobil). Information and registration: Art Donovan, donovan@bp.com, or Kirt Campion, kirt.m.campion@exxonmobil.com.

Biological Revolutions in the Neoproterozoic and Cambrian

Sat., Nov. 6. Sponsored by *Paleontological Society*. Organizers: Ben Waggoner, Dept. of Biology, University of Central Arkansas, Conway, AR 72035-5003, (501) 450-5037, fax 501-450-5914, benw@mail.uca.edu; Jere Lipps, Museum of Paleontology, University of California, Berkeley, CA 94720-4780, (510) 642-9006, fax 510- 642-1822, jlipps@uclink4.berkeley.edu.

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 Christine McLelland, cmclelland@geosociety.org or (303) 357-1082, for more information.

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Additionally, volunteers receive a stipend of $25 for each half-day (5 hours) volunteered at the meeting. (Stipends can only be issued to students who have a U.S. government–issued Social Security Number, Green Card, or Student Work Visa.) New this year: optional partial food stipend available.

Students: Sign Up to Volunteer and Reap the Rewards

DENVER 2004 REGISTRATION INFORMATION

EARLY BIRD REGISTRATION DEADLINE: JULY 13
STANDARD REGISTRATION DEADLINE: SEPTEMBER 30
CANCELLATION DEADLINE: OCTOBER 7

NEW! GSA has changed its pricing structure to include "Early Bird" registration (June through July 13). Register by July 13—which is also the abstract submission deadline—for significant discounts. Registration information will be available in the June issue of *GSA Today* and on the GSA Web site, www.geosociety.org, in early June. Online registration and information regarding Subaru-sponsored grants for Colorado-based graduate students and two-year college faculty also will be available in early June.

REGISTRATION FEES

	Early Bird (by 7/13)	Standard (7/14–9/30)	Late/Onsite (after 9/30)
Professional Member—Full Meeting	$275	$295	$375
Professional Member—1 Day	–	$190	$200
Professional Member (70 or older)—Full Meeting	$220	$240	$315
Professional Member (70 or older)—1 Day	–	$135	$145
Professional Nonmember—Full Meeting	$350	$375	$465
Professional Nonmember—1 Day	–	$215	$225
Student Member—Full Meeting	$60	$90	$120
Student Member—1 Day	–	$60	$60
Student Nonmember—Full Meeting	$80	$120	$150
Student Nonmember—1 Day	–	$75	$75
K–12 Professional—Full Meeting	$35	$40	$40
Field Trip or Short Course Only	–	$40	$40
Guest or Spouse	$70	$80	$80

NOT A GSA MEMBER?

You can save a substantial amount on your registration fee by becoming a GSA member; it's almost like joining GSA for free! GSA is on a calendar-year membership cycle, so join now to reap the benefits of GSA membership for the rest of 2004. For further information or to join, go to www.geosociety.org/members/ or contact GSA Sales and Service, gsaservice@geosociety.org, 1-888-443-4472, or (303) 357-1000, option 3.

LODGING

Denver offers high-quality, affordable hotel rooms for meeting attendees. GSA has booked rooms at eight hotels, offering special convention rates ranging from $105 to $160 per night. The co-headquarters hotels are the Denver Marriott City Center and the Hyatt Regency Denver. Most activities will take place at the Colorado Convention Center and the two headquarters hotels. Additional housing information will be included in the June issue of *GSA Today.*

Guests Invited!

GSA extends a warm welcome to all spouses, family members, and friends to register for the Guest Program. Registration for the Guest Program begins in June.

The guest or spouse registration fee of $80 per person ($70 if you register by July 13) 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 visitor badges that allow them to attend a specific presentation.

Make plans now to participate in the GSA Guest Program at the Annual Meeting in Denver. After sightseeing trips, exploring Denver, and browsing in the Exhibit Hall, you'll appreciate having a quiet place to sit down and have a beverage!

Guest Hospitality Suite Hours
Sun.–Wed., Nov. 7–10
8 a.m.–5:30 p.m.

Look for registration information in the June issue of *GSA Today*, or register online at www.geosociety.org.

GSA MENTOR PROGRAMS

at the GSA Annual Meeting

ATTENTION

Students Pursuing a Hydrogeology Career Path!

The new Mann Mentors in Applied Hydrogeology Program makes it possible for up to 25 students to attend the distinguished Hydrogeology Division Luncheon and Awards Presentation luncheon, without cost to the students. Eligible students will have the chance to meet some of the nation's top hydrogeologists and observe the presentations of the coveted O.E. Meinzer Award, the Student Research Grants Awards, and the Distinguished Service Award from the membership of the GSA Hydrogeology Division. Eligible students are those who have indicated their professional interest in hydrology/hydrogeology on their GSA membership applications and who register for the GSA Annual Meeting by September 30, 2004. FREE tickets will be awarded to the first 25 students who respond to an e-mail invitation, based on the eligibility criteria above. Registration is required. Time and location to be announced.

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

Seeking Employment?

Plan to attend the Careers Roundtable Discussions (formerly the Employment Opportunities in the Geological Sciences Roundtable Discussions). Along with getting a new name, this event has expanded, with mentors offering one-on-one career advice. These mentors hail from a broad range of geoscience-related careers representing academics, industry, and government agencies. If you are seeking employment now, or will be in the future, join this group for networking opportunities and job-market perspectives.

This FREE come-and-go event is open to everyone. Registration is not required.

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

Careers Roundtable Discussions

Sat., Nov. 6, 1–3 p.m.
Ballroom 1 (adjacent to GSA Employment Services)

Students: Check Out the Geology in Government Mentor Program!

Plan to arrive early for this FREE lunch for undergraduate and graduate students. This popular annual event will feature a select panel of mentors representing various government agencies. Mentors will invite questions, offer advice about preparing for a career, and comment on the prospects for current and future job opportunities with their agencies.

Registration is not required; however, every student registered for the GSA Annual Meeting will receive a ticket to this event along with their badge. Limited attendance—arrive early!

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

Geology in Government Mentor Program

Mon., Nov. 8, 11:30 a.m.–1 p.m.
Location TBA

Find us on the Web at www.geosociety.org.

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, please visit the Web sites from each Section listed below or contact the Section secretary directly.

CORDILLERAN	www.geosociety.org/sectdiv/cord/ Joan E. Fryxell (909) 880-5311 cordsect@csusb.edu
ROCKY MOUNTAIN	www.geosociety.org/sectdiv/rockymtn/ Kenneth E. Kolm (303) 273-3932 kkolm@mines.edu
NORTH-CENTRAL	www.geosociety.org/sectdiv/Northc/ Robert F. Diffendal Jr. (402) 472-7546 rfd@unl.edu
NORTHEASTERN	www.geosociety.org/sectdiv/northe/ Stephen G. Pollock (207) 780-5353 pollock@usm.maine.edu
SOUTH-CENTRAL	www.geosociety.org/sectdiv/southc/ Elizabeth Y. Anthony (915) 747-5483 eanthony@geo.utep.edu
SOUTHEASTERN	www.geosociety.org/sectdiv/southe/ Donald W. Neal (252) 328-4392 neald@mail.ecu.edu