

The Geochemical News

Newsletter of the Geochemical Society

Number 80

Annual Meeting Special Issue

Fall 1991

This is a special issue of *The Geochemical News* designed solely to provide technical program, registration, housing and travel information about the upcoming Annual Meeting of the Geochemical Society at the Geological Society of America Annual Meeting, San Diego, CA, October 21-24, 1991. The first two pages of the newsletter contains a selected list of events and scientific sessions that might be of special interest to Geochemical Society Members. The remaining pages of the newsletter contain a more complete list of theme sessions and symposia provided by GSA as well as the registration, housing and travel information.

There will be the usual fall newsletter. Items for submission to the fall issue of *The Geochemical News* should be sent to S.B. Shirey, Carnegie Institution of Washington, 5241 Broad Branch Rd., NW, Washington, DC, 20015, USA before October 15, 1991. Rapid submission of material by facsimile (202-364-8726) or electronic mail (SHIREY@CIW.SPAN.NASA.GOV) is encouraged.

SCHEDULE OF GEOCHEMICAL SOCIETY EVENTS, SYMPOSIA AND THEME AND DISCIPLINE SESSIONS OF POTENTIAL INTEREST TO GEOCHEMICAL SOCIETY MEMBERS

(1991 GSA Annual Meeting San Diego, California. October 21 - 24, 1991)

- SUN AM 08:00-12:00 --SYMPOSIUM S17, ORGANIC GEOCHEMISTRY DIVISION,
Survivability of Organic Matter at High Temperature: Implications for Life
- SUN PM 13:00-17:00 ---SYMPOSIUM S17, ORGANIC GEOCHEMISTRY DIVISION,
Survivability of Organic Matter at High Temperature: Implications for Life
- 17:15-18:00 --ORGANIC GEOCHEMISTRY DIVISION BUSINESS MEETING
- 18:00-21:00 --GEOCHEMICAL SOCIETY COUNCIL MEETING
- MON AM 08:00-10:30 --DISCIPLINE SESSION: *Igneous Geochemistry: Isotopes and Trace Elements*
- 08:00-12:00 --SYMPOSIUM S2: *Coalbed Methane: Geology, Recovery Technology and Resources*
- 08:00-12:00 --SYMPOSIUM S12: *Contact Metamorphism*
- 08:00-12:00 --THEME SESSION T7: *Processes Controlling the Composition of Siliciclastic Sediments*
- 08:00-12:00 --THEME SESSION T14: *Site Characterization Studies Related to Groundwater and Surface Water Contamination at Sites Operated by the US Dept.of Energy*
- 11:00-12:00 --GS PRESIDENTIAL ADDRESS Speaker: JAMES J. PAPIKE
The Valley of Ten Thousand Smokes, Katmai, Alaska: a Unique Geochemistry Laboratory

- MON PM 12:30-14:00 --GEOCHEMICAL SOCIETY LUNCHEON and AWARDS
- 13:00-17:00 --THEME SESSION T7: *Processes Controlling the Composition of Siliciclastic Sediments*
- 14:00-16:45 --THEME SESSION T12: *Actinide Disequilibria in Igneous and Geothermal Processes*
- 13:00-17:00 --THEME SESSION T14: *Site Characterization Studies Related to Groundwater and Surface Water Contamination at Sites Operated by the US Dept.of Energy*
- 13:00-17:00 --THEME SESSION T15: *Geology, Hydrogeology and Tectonics of Southern Nevada in Relation to Potential Storage of High-level Nuclear Waste*
- 13:00-17:00 --SYMPOSIUM S15: *Applications of Microanalytical Techniques to Economic Geology*
- TUE AM 08:00-12:00 --POSTER SESSION: *Sedimentary Geochemistry*
- 08:00-12:00 --POSTER SESSION: *Isotope and Aqueous Geochemistry*
- 08:00-12:00 --POSTER SESSION: *Hydrothermal and Igneous Geochemistry*
- 08:00-12:00 --SYMPOSIUM S20: *Venus and Earth: Tectonic and Volcanic Evolution*
- 08:00-12:00 --THEME SESSION T16: *Characterization and Monitoring of Ground-Water Contamination at Hazardous Waste Sites: Research and Case Histories*
- 08:00-12:00 --THEME SESSION T27: *Jurassic Magmatism and Tectonics of the North American Cordillera*
- 10:30-12:00 --DISCIPLINE SESSION: *Geochemistry of Surfaces*
- TUE PM 13:30-17:30 --DISCIPLINE SESSION: *Thermodynamics of Aqueous Solutions*
- 13:30-17:30 --GS SYMPOSIUM S10: *Mashing and Smashing: Geochemical Evidence for Long-term Crust-mantle Interaction along a Cratonic Margin, NW US*
- 13:30-17:30 --THEME SESSION T27: *Jurassic Magmatism and Tectonics of the North American Cordillera*
- 17:30-19:30 --MSA-GS JOINT RECEPTION
- WED AM 08:00-12:00 --DISCIPLINE SESSION: *Isotope Geochemistry: Techniques and Applications*
- 08:00-12:00 --DISCIPLINE SESSION: *Geochemical Kinetics: Field vs Laboratory Rates (a)*
- 08:00-12:00 --THEME SESSION T24: *Active Margin of Antarctica-Proterozoic to Holocene*
- WED PM 13:30-14:45 --DISCIPLINE SESSION: *Isotope Fractionation, Exchange and Diffusion*
- 14:45-17:30 --DISCIPLINE SESSION: *Geochemical Kinetics: Field vs Laboratory Rates (b)*
- 13:30-16:30 --THEME SESSION T13: *Solution Mass Transfer and Volume Strain in Crustal Rocks*
- 13:30-16:30 --THEME SESSION T30: *New Views of the Moon: The Lunar Frontier Revisited*
- THU AM 08:00-10:00 --DISCIPLINE SESSION: *Sedimentary and Diagenetic Geochemistry*
- THU PM 13:00-15:00 --DISCIPLINE SESSION: *Sedimentary Fluid Flow*

1991 ANNUAL MEETING

San Diego, California • October 21–24, 1991

Marriott Hotel & Marina • San Diego Convention Center

TECHNICAL PROGRAM

Technical sessions consist of both invited and volunteered papers organized in one of three presentation formats: symposia, theme sessions, and discipline sessions. Abstracts were due on July 3 and selected and organized into sessions on August 2 and 3 by the Joint Technical Program Committee (JTPC). The JTPC consists of 30 geoscientists representing those associated societies and GSA divisions participating in the technical program. The JTPC chairmen, nominated by the Annual Meeting Committee and approved by the GSA Council, also serve a four-year term on GSA's ongoing Program Committee, which oversees all technical program activities.

Abstract notices mailed

August 14

Speaker information mailed

August 24


Technical Program Schedule

(GSA Today) September 5

1991 Technical Program Chairmen
Richard W. Berry and Gary H. Girty
San Diego State University
(619) 594-5586

GLOBAL PERSPECTIVE THEME

Geologists have long approached their science with a global perspective, a recognition recently reaffirmed by plate tectonics. Our meeting theme not only reminds us of the global character of earth processes and natural phenomena, but calls attention to the global extent of environmental deterioration, the global dependence of our natural resource inventory, and the need for scientists, especially earth scientists, to address these concerns from a global perspective.

Within this theme several programs have been initiated by the San Diego Annual Meeting Committee. These are called Global Challenge sessions, identified by the symbol . There will be four Global Challenge theme sessions, a Monday evening open forum, and a Thursday afternoon wrap-up session. The meeting schedule lists a number of other sessions initiated by other organizations which address closely related topics.

Leading off the Global Perspective theme on Monday morning will be a special Keynote Symposium, organized by Patrick L. Abbott and R. Gordon Gastil, San Diego State University.

The Global Challenge: Our Environment, Our Resources, Our Responsibilities

Monday, October 21, 8:45 a.m. to 12:00 noon

San Diego Convention Center, Room 6A

1991 Annual Meeting Honorary Chairman, Roger R. Revelle, University of San Diego
"The Global Challenge"

Digby J. McLaren,
Royal Society of Canada
"Events and Their Causes—
Uncertainty in the Ecosphere?"

Frank Press,
National Academy of Sciences
"Natural Hazards: Science Instead of
Fatalism"

Lynn Margulis,
University of Massachusetts
"Gala for Geologists: Darwinian Time
and Vernadskian Space"

Michael B. McElroy,
Harvard University
"Change in Global Environment:
Perspectives on Human Influence"

Brian J. Skinner,
Yale University
"A Kilometer and Deeper: Will
Geologists Be Ready for the Tough
Prospecting Challenges Ahead?"

M. Gordon Wolman,
Johns Hopkins University
"Water Quantity and Quality:
Changes in the Hydrologic Cycle"

Global Challenge Roundup

Monday, October 21, 5:00 to 6:45 p.m.
San Diego Convention Center

Focusing on the Global Challenge, U.S. Congressman George E. Brown, Jr., Chairman of the House Sub-Committee on Science, Space and Technology, will address the audience from 5:00 to 5:30 p.m. This will be followed by a panel discussion with the morning's keynote speakers and several international guests.

Global Perspective Rapporteur Session

Thursday, October 24, 1:30 to 3:30 p.m.
San Diego Convention Center

Rapporteurs for the Global Challenge theme sessions will summarize and discuss the evidence and ideas presented earlier in the respective sessions. (See Theme List: T1–T4.) This will be followed by a prominent speaker who will bring together the various threads of the global theme and provide a focus for the conclusion of our meeting.

INVITED PAPERS (SYMPOSIA)

This format includes only abstracts that have been invited by the convener of a symposium. The dates indicated are tentative and may be changed by the JTPC. Full descriptions appeared in the June issue of GSA Today.

S1. **Archaeological Geology of the Archaic Period (8–3 ka) in North America.** *Archaeological Geology Division.* E. Arthur Bettis III, Iowa Dept. of Natural Resources, Iowa City. Tuesday, October 22, afternoon.

S2. **Coalbed Methane: Geology, Recovery Technology, and Resources.** *Coal Geology Division.* Walter B. Ayers, Jr., Taurus Exploration USA, Inc., Birmingham, Alabama; Jeffrey R. Levine, University of Alabama. Monday, October 21, morning.

S3. **GeoRisk Assessment.** *Engineering Geology Division.* Charles Welby, North Carolina State University; Rhea Lydia Graham, Science Applications International Corp., Albuquerque, New Mexico. Tuesday, October 22, morning.

S4. **Depositional Environments and the Development of Aquifers.** *Hydrogeology Division.* Robert L. Laney, U.S. Geological Survey, Reston, Virginia. Wednesday, October 23, morning.

S5. **Geology of the Pacific Rim.** *International Division.* Tadashi Sato, Hyogo University, Hyogo, Japan; Bruce Hanshaw, Consulting Geologist, McLean, Virginia. Tuesday, October 22, afternoon.

S6. **Quaternary Climatic Change in Arid and Semiarid Western North America: Evidence from the Great Basin, Desert Southwest, and Great Plains.** *Quaternary Geology and Geomorphology Division.* Richard F. Madole and Daniel R. Muhs, U.S. Geological Survey, Denver, Colorado. Wednesday, October 23, morning.

S7. **Fluvial Response to Base-level Changes: Eustatics vs. Tectonics—Part I.** *Sedimentary Geology Division.* Paul L. Heller, University of Wyoming; Christopher Paola, University of Minnesota, Minneapolis; Henry Posamentier, ESSO Resources Canada, Calgary, Alberta. Tuesday, October 22, morning.

S8. **Strike-Slip Faulting: Geological and Geophysical Perspectives.** *Geophysics and Structural Geology and Tectonics Divisions.* Art Sylvester, University of California, Santa Barbara; Kristian Meising, ARCO Oil & Gas Co., Plano, Texas; Eugene Humphries, University of Oregon; Matt Golombek, Jet Propulsion Laboratory, Pasadena, California. Wednesday, October 23, all day.

S9. **The Global Climate Transition from the Late Paleocene to Early Eocene.** *Cushman Foundation.* Kenneth G. Miller, Rutgers University; Lowell Stott, University of Southern California. Tuesday, October 22, morning.

S10. **MASHING and Smashing: Geochemical Evidence for Long-term Crust-mantle Interaction along a Cratonic Margin, Northwest U.S.** *Geochemical Society.* Paul A. Mueller, University of Florida; Joseph L. Wooden, U.S. Geological Survey, Menlo Park, California. Tuesday, October 22, afternoon.

S11. **International Initiatives in Geoscience Information—A Global Perspective.** *Geoscience Information Society.* Dena Fracoll, Information Consultant, Fort Worth, Texas. Monday, October 21, morning.

S12. **Contact Metamorphism.** *Mineralogical Society of America.* Maria Luisa Crawford, Bryn Mawr College; Robert J. Tracy, Virginia Polytechnic Institute and State University; Derrill M. Kerrick, Pennsylvania State University, University Park. Monday, October 21, morning.

S13. **New Approaches to Introductory Geology Courses.** *National Association of Geology Teachers.* Noel Potter, Jr., Dickinson College, Carlisle, Pennsylvania. Monday, October 21, afternoon.

S14. **Biologic Turnover Examined in a Phylogenetic Context.** *Paleontological Society and Society of Vertebrate Paleontologists.* J. David Archibald, San Diego State University; Sandra J. Carlson, University of California, Davis. Wednesday, October 23, morning.

S15. **Applications of Micro-analytical Techniques to Economic Geology.** *Society of Economic Geologists.* C. Stewart Eldridge, Australian National University, Canberra. Monday, October 21, afternoon.

S16. **Crustal-scale Controls on Ore Deposits.** *Society of Economic Geologists.* Robert J. Bodnar, Virginia Polytechnic Institute and State University. Sunday, October 20, all day.

S17. **Survivability of Organic Matter at High Temperature: Implications for Life.** *Organic Geochemistry Division of the Geochemical Society.* Stephen A. Macko, University of Virginia; Everett L. Shock, Washington University; Michael H. Engel, University of Oklahoma. Sunday, October 20, all day.

S19. **Continental Drift, Plate Tectonics, and Biogeography: The History of a Synthesis of Two Cultures.** *History of Geology Division.* Alan E. Leviton, California Academy of Sciences, San Francisco; Michele L. Aldrich, American Association for the Advancement of Science, Washington, D.C. Monday, October 21, morning.

S20. **Venus and Earth: Tectonic and Volcanic Evolution.** *Planetary Geology Division.* Baerbel K. Lucchitta, U.S. Geological Survey, Flagstaff, Arizona. Tuesday, October 22, morning.

S21. **Geophysics of the Southwestern Cordillera—USA and Mexico.** George R. Jiracek, San Diego State University; Mario Martínez, Centro de Investigación Científica y de Educación Superior de Ensenada, Baja California, Mexico. Sunday, October 20, afternoon.

S22. **PANGEA: Ice-house Processes, Climates, and Events on a Supercontinent.** *Sedimentary Geology Division and Global Sedimentary Geology Program.* George deV. Klein, University of Illinois, Urbana. Sunday, October 20, afternoon.

(S18. Withdrawn)

VOLUNTEERED PAPERS

This format includes all abstracts that are not specifically invited for a symposium. Two types of sessions are available:

1. Discipline sessions

The JTPC selects and organizes papers in sessions that focus on one scientific discipline, e.g., hydrogeology or structural geology. Each paper receives three reviews. The papers are organized with topical coherence whenever possible, and sessions may be given an appropriate title by the JTPC representative.

2. Theme sessions

Papers are submitted to a specific, preannounced topic and to one scientific category. Theme sessions are interdisciplinary; each theme may have as many as three disciplines (categories) associated with it. Each theme has one or more advocates who proposed the idea as well as encouraged submission of papers. The advocates, however, are not able to guarantee acceptance of papers, since this is the responsibility of the reviewers and the JTPC representatives. Full theme descriptions appeared in the April issue of *GSA Today*.

T1/2. The Global Challenge: Using Planetary Resources and Modeling the Future
William S. Fyfe, University of Western Ontario; Digby J. McLaren, Royal Society of Canada; Brian J. Skinner, Yale University; Carroll Ann Hodges, U.S. Geological Survey, Menlo Park, California. Environmental Geology, Global Geoscience, Quaternary Geology, Economic Geology, Petroleum Geology.

T3. Global Climate Changes—I: The Geologic Record of Climate Dynamics. Tim Herbert, Scripps Institution of Oceanography; Jeff Park, Yale University. Marine Geology, Paleoclimatology, Paleogeography/Paleobotany.

T4. Global Climate Changes—II: The Past, a Key to the Future. Keith Kvenvolden, U.S. Geological Survey, Menlo Park, California. Geochemistry, Global Geoscience, Paleoclimatology/Paleogeography.

T5. Global Warming and Geologic Evidence of Aridification During Late Quaternary Time. *Quaternary Geology and Geomorphology Division.* Dale F. Ritter and Nicholas Lancaster, Desert Research Institute, Reno, Nevada. Geomorphology, Hydrogeology, Quaternary Geology.

T6. Fluvial Response to Base-level Changes: Eustatics vs. Tectonics—Part II. *Sedimentary Geology Division.* Paul L. Heller, University of Wyoming. Geomorphology, Sedimentology, Stratigraphy.

T7. Processes Controlling the Composition of Siliciclastic Sediments. Mark J. Johnsson, U.S. Geological Survey, Menlo Park, California; Abhijit Basu, Indiana University. Sedimentology, Petrology, Sedimentology.

T8. Global Sedimentary Geology of the Phanerozoic: A Theme Session in Honor of A. B. Ronov. William W. Hay, University of Colorado; Bruce Wilkinson, University of Michigan. Geochemistry, Global Geoscience, Sedimentology.

T9. Approaches to Sequence Stratigraphic Analysis—Examples from the Tertiary. Janet Coleman, Kansas Geological Survey. Global Geoscience, Sedimentology, Stratigraphy.

T10. The K-T Boundary—I: Late Cretaceous Extinctions: Catastrophes or Not? Robert M. Sullivan, San Diego Natural History Museum; Spencer G. Lucas, New Mexico Museum of Natural History. Paleontology/Paleobotany, Stratigraphy.

T11. The K-T Boundary—II: Nonmarine Fossil Record at the Cretaceous-Tertiary Boundary. *Paleontological Society.* R. Farley Fleming, University of Colorado at Denver; William A. Clemens, University of California, Berkeley. Paleontology/Paleobotany, Stratigraphy.

T12. Actinide-series Disequilibria in Igneous and Geothermal Processes. Neil Sturchio, Argonne National Laboratory, Illinois; Michael Murrell, Los Alamos National Laboratory, New Mexico. Aqueous Geochemistry, Igneous Petrology, Volcanology.

T13. Solution Mass Transfer and Volume Strain in Crustal Rocks. Mark Brandon and Jay J. Ague, Yale University. Hydrogeology, Metamorphic Petrology, Structural Geology.

T14. Site Characterization Studies Related to Ground-Water and Surface-Water Contamination at Sites Operated by the U.S. Department of Energy. Stephen H. Stow and C. Stephen Haase, Oak Ridge National Laboratory, Tennessee. Engineering Geology, Environmental Geology, Hydrogeology.

T15. Geology, Hydrogeology, and Tectonics of Southern Nevada in Relation to the Potential Storage of High-Level Nuclear Waste. Steven R. Mattson, Science Applications International Corp., Las Vegas, Nevada. Hydrogeology, Tectonics, Volcanology.

T16. Characterization and Monitoring of Ground-Water Contamination at Hazardous Waste Sites: Research and Case Histories. *Hydrogeology Division.* Claudia Stone, S.S. Papadopolous & Associates, Inc., Rockville, Maryland. Engineering Geology, Environmental Geology, Hydrogeology.

T17/18. Urban Geologic Hazards: Recognition and Remediation. *Engineering Geology Division.* Daryl Streiff, Consulting Engineering Geologist, San Diego, California; Lyne Perry, Leighton and Associates, San Diego, California. Engineering Geology, Environmental Geology, Hydrogeology.

T21. Geophysical Exploration for Ground Water in Arid and Semi-Arid Regions. *Hydrogeology Division.* William F. McCaffrey, U.S. Geological Survey, Sacramento, California. Engineering Geology, Geophysics, Hydrogeology.

T22. Multivariate Statistical Methods in the Geosciences. *Hydrogeology Division.* Charles Brown, U.S. Geological Survey, Reston, Virginia. Computers, Global Geoscience, Hydrogeology.

T23. Failure Mechanisms of Megaslides. *Engineering Geology Division.* Martin Stout, California State University, Los Angeles; Michael Hart, Gecon, Inc., San Diego, California. Engineering Geology, Quaternary Geology, Structural Geology.

T24. Active Margin of Antarctica—Proterozoic to Holocene. David Kimbrough, San Diego State University; Bruce Luyendyk, University of California, Santa Barbara. Igneous Petrology, Structural Geology, Tectonics.

T25. Cenozoic Extension in the Cordillera: Geometry, Timing, Mechanisms, and Regional Controls. William Dickinson and Jon Spencer, University of Arizona. Geophysics/Tectonogeophysics, Structural Geology, Tectonics.

T26. Mesozoic Stratigraphic and Structural Evolution of Northwestern Mexico. Claudio Bartolini, Gold Fields Mining Corp., Yuma, Arizona; Mariano Morales M., Universidad de Sonora, Mexico. Stratigraphy, Structural Geology, Tectonics.

T27. Jurassic Magmatism and Tectonics of the North American Cordillera. *Dedicated to Richard L. Armstrong.* David Miller, U.S. Geological Survey, Menlo Park, California; Cathy Busby-Spera, University of California, Santa Barbara; Steven Reynolds, Arizona Geological Survey; James Wright, Rice University. Igneous Petrology, Stratigraphy, Tectonics.

T28. Tectonics of Modern and Ancient Accretionary Prisms. J. Casey Moore, University of California, Santa Cruz; Darrel Cowan, University of Washington; Daniel Karig, Cornell University; Michael B. Underwood, University of Missouri, Columbia. Marine Geology, Metamorphic Petrology, Tectonics.

T29. Landscapes of Tectonically Active Strike-Slip, Normal and Reverse Faults. William Bull, University of Arizona; Thomas Rockwell, San Diego State University. Geomorphology, Quaternary Geology, Tectonics.

T30. New Views of the Moon: The Lunar Frontier Revisited. Donald A. Morrison, Johnson Space Center, Houston, Texas. Geochemistry, Geophysics, Planetary Geology.

T31. Southern California Areal Mapping Project—Accomplishments, Work-in-Progress, Goals (POSTER SESSION). Vickie Todd, University of California, Riverside. Igneous Petrology, Stratigraphy, Tectonics.

T32. Baja California: Geologic History of the Peninsula and Gulf of California. Judy Terry Smith, Consulting Geologist, Palo Alto, California; Jose Luis Ferman and Jorge Ledesma, Universidad Autónoma de Baja California, Ensenada, Baja California, Mexico. Paleontology/Paleobotany, Stratigraphy, Structural Geology.

T33. Geology of the Future—Now (POSTER SESSION). *Sigma Gamma Epsilon.* Daniel F. Merriam, Wichita State University; Charles J. Mankin, University of Oklahoma. Environmental Geology, Stratigraphy, Other.

T34. Earth Scientists and Science Educators: Common Ground. *National Earth Science Teachers Association.* Leslie C. Gordon, U.S. Geological Survey, Menlo Park, California. Geology Education.

(T19. Withdrawn)

(T20. Withdrawn)

PROFESSIONAL HORIZONS

GSA-SPONSORED SHORT COURSES

Would you like to learn something new, brush-up on the latest, or refresh the basics? GSA short courses will be held immediately before and after the Annual Meeting in San Diego and are open to members and nonmembers. Registration for the meeting is not required. Preregistration is recommended; on-site is \$25 additional. You may register for GSA courses on the Annual Meeting Preregistration Form. Registration substitutions may be made at any time.

PREREGISTRATION
DEADLINE: SEPTEMBER 20

Cancellation Deadline: September 27

FOR MORE INFORMATION
CONTACT GSA COURSE REGISTRAR

1. **Concepts, Strategy, and Software for Practical Three-Dimensional Contaminant Transport Modeling**

2. **Description and Analysis of Fluid-Mineral Equilibria Using the SUPCRT91 Software Package**

3. **Deformation and Kinematics of High Strain Zones**
4. **Fractals and Their Use in Earth Sciences**
5. **Quantitative Sedimentary Basin Modeling**
6. **Thermochronology: Applications to Tectonics, Petrology, and Stratigraphy**
7. **Assessing the Mobility of Chemicals in the Vadose Zone**
8. **Computer-aided Illustration in Geology**
9. **Earthquakes and Earthquake Preparedness**
10. **Hydrogeologic and Environmental Applications of Stable Isotopic Systems**
11. **Applications of Radar Remote Sensing: Terrestrial and Planetary**
12. **Contaminant Hydrogeology: Practical Monitoring, Protection, and Cleanup**
13. **Sedimentary Basin Systems**

OPEN FORUMS

Congressional Field Hearing on Earthquake Hazards

Monday, October 21, 1:00 to 4:00 p.m.
San Diego Convention Center

The national House Committee on Science, Space, and Technology will be holding a field hearing on earthquake hazards in San Diego during the GSA meeting. Some of GSA's members will be expert witnesses. Everyone is invited to drop in to view the government's decision-making process in action.

Geology and Public Policy Forum

Geologic Information Needs of Local Governments: Emergency Response Planning and Earthquake Planning Scenarios

Tuesday, October 22, 12:00 noon to 1:30 p.m.
San Diego Convention Center

The GSA Geology and Public Policy Committee will sponsor a forum on the needs of local governments for geologic information. The focus will be emergency response planning and the role that earth scientists can and should have in providing basic and interpreted scientific information to emergency response planners for the purpose of improving response plans, conducting exercises, and improving the public's general knowledge of local and regional geologic hazards.

Discussion will center on the Planning Scenario for a Major Earthquake, San Diego-Tijuana Metropolitan Area, recently released by the California Department of Conservation, Division of Mines and Geology.

The earthquake planning scenario will provide the foundation for discussions by local, state, and federal planners on how the scenario

information is used and in what forms geologic information is most useful to government officials who do not necessarily have in-house scientific expertise. A panel discussion will focus on how geologic hazards information can be presented so as to be most useful.

This forum will be the seventeenth in a series and will be open to everyone, including guests and the general public; no cost or registration.

Venus: A Global Perspective from the Magellan Mission

Tuesday, October 22, 12:15 to 1:15 p.m.
San Diego Convention Center

During the 243-day primary mission, which ended May 15, 1991, Magellan's radar mapped 84% of the surface of Venus. With these data scientists have begun to address what processes have shaped this Earth-like planet. The first global look reveals that tectonism and volcanism have been the dominant processes on Venus. R. Stephen Saunders, Magellan Project Scientist, will talk about these findings as well as goals for extended mission cycles.

OTHER SHORT COURSES/WORKSHOPS/FORUMS

MSA-Sponsored Course

Contact Metamorphism Short Course

Friday, October 18 through Sunday, October 20
Pala Mesa Resort, San Diego, California

Class will be held in the morning and early evening, leaving afternoons free for recreation. A welcoming reception will be held Thursday evening, October 17, as well as a summary round-table discussion on Sunday morning, October 20.

This course, convened by Derrill M. Kerrick, Pennsylvania State University, will use theoretical, experimental, and field information to elucidate the processes and controls of contact metamorphism. Speakers will review current knowledge and will explore avenues for future research. Particular emphasis is given to multidisciplinary analysis of contact metamorphism (igneous and metamorphic petrology, geochemistry, thermal modeling, structural geology).

Preregistration required.
 Limit: 125. Fee: MSA member—\$530 (double room), \$680 (single room); MSA student member—\$340. Nonmembers—\$570 (double room), \$720 (single room); student nonmember—\$360. Fee includes accompanying volume of *Reviews in Mineralogy*, lodging Thursday, Friday, and Saturday nights, and all meals beginning with the reception and light buffet dinner on Thursday through lunch on Sunday. There are a limited number of student scholarships available to support students actively involved in thesis research on or related to contact metamorphism. For information and registration: MSA Business Office, 1130 17th Street, N.W., Suite 330, Washington, DC 20036, (202) 775-4344, fax 202-775-0018.

SEPM and PS-Sponsored Course

Sequence Stratigraphy and Biostratigraphic Patterns: An Integrated Approach to Defining Basin History

Saturday, October 19, 8:00 a.m. to 5:00 p.m.
Holiday Inn on the Bay

This hands-on course consists of a series of exercises in integration of seismic record sections, wireline logs, and biostratigraphic data. Each participant receives a complete set of short course notes and exercise materials. The study area is offshore Texas where the Pliocene-Pleistocene stratigraphy is dominated by progradational cycles across a tectonic framework of basin-margin subsidence and salt withdrawal. The course is organized for geologists and geophysicists with introductory knowledge of stratigraphy and sedimentation. The sequence of exercises will expose the participants to (1) depositional systems, (2) facies analysis, (3) chronostratigraphic framework, (4) integration of multiple data sets, (5) comparison of local to global depositional patterns, and (6) application of the integrated approach to stratigraphic problems. (Credit: 0.7 C.E.U.)

Faculty: John M. Armentrout, Mobil Research & Development Corp., Dallas, Texas.

Preregistration required.
 Limit: 30. Fee: SEPM and PS members—\$185, nonmembers—\$200 (includes course notes). For information and registration: SEPM Business Office, P.O. Box 4756, Tulsa, OK 74159, (918) 743-9765, fax 918-743-2498.

PS-Sponsored Workshop and Course

Paleoecology Workshop

Saturday, October 19, 8:00 a.m. to 5:00 p.m.

Pala Mesa Resort, San Diego, California

This workshop will consist of a full day of short presentations by the faculty and extensive discussion with the participants centered around three themes that represent areas of future growth in paleoecology. These themes are (1) geochemistry, (2) sequence and event stratigraphy, and (3) the role of uniformitarianism in paleoecology.

Faculty: Brian Rosen, Peter Sheehan, Carl Brett, Keith Meldahl, Arnie Miller, Doug Jones, and Brad Sageman.

Preregistration required.
 Limit: 50. Fee: \$110 (double room), \$155 (single room). Fee includes shuttle service from the San Diego Airport to the Pala Mesa Resort until 10:00 p.m. on Friday evening, Friday evening welcoming reception, Friday night lodging, all Saturday meals, course handouts, and transportation to downtown San Diego hotels after dinner on Saturday. For information and registration: Mary Droser, Dept. of Earth Sciences, University of California, Riverside, CA 92521, (714) 787-3797, or David Bottjer, Dept. of Geological Sciences, University of Southern California, Los Angeles, CA 90089, (213) 740-6100.

Analytical Paleontology Short Course

Sunday, October 20, 8:00 a.m. to 5:00 p.m.
Marriott Hotel

This course will focus on new applications of analytical methodologies to the fossil record. A series of speakers will address a wide range of application of analytical methodologies, ranging from biostratigraphic to sampling problems, from constructional morphology to diversity patterns. The emphasis of the course is on providing tools for research and teaching. Interested geoscientists are welcome to attend all or part of the course.

Faculty: Philip W. Signor, Carl Koch, Mike Foote, George McGhee, Daniel C. Fisher, Lucy Edwards, Rebecca Z. German, Charles Marshall, J. John Sepkoski, Jr., David M. Raup, and Norman L. Gillsky.

No fee or registration.
 Course notes will be available on-site for approximately \$10. For information: Norman L. Gillsky, Dept. of Geological Sciences, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061, (703) 231-5951, fax 703-231-3386, or Philip W. Signor, Dept. of Geology, University of California, Davis, CA 95616, (916) 752-0846, fax 916-752-0951.

Annenberg/CPB Project Workshop for College Teachers

Teaching Introductory Geology with Video as a Partner

Sunday, October 20. Two separate sessions: 8:30 a.m. to 12:00 noon or 1:00 to 4:30 p.m.
San Diego Convention Center

Sponsored by *The Annenberg/CPB Project* in conjunction with the *National Association for Geology Teachers* and the *Southern California Consortium*.

Explore how to use video models to prompt students to interact with geology concepts, with examples drawn from the new PBS 26-part series, "EARTH REVEALED: Introductory Geology." Emphasis will be on the capability of the video to:

- show role models of geologists and scientific research in action,
- provide visual imagery of dynamic processes important to geology, such as landslides, earthquakes, and sediment transport,
- offer vivid examples with lasting impact of strong links between the study of geology and the needs of human society.

The two separate workshops will include working within small groups organizing inventive approaches to a lesson on volcanism or mass wasting, for example. Workshops will be led by Richard W. Hazlett, Pomona College, together with geology advisors from the "EARTH REVEALED" academic development team and the producer of the video series from the Southern California Consortium.

Limit: 60 persons per half-day session. No fee. Preregistration required. For information and registration: Janice Ford, Annenberg/CPB Project, 901 E Street N.W., Washington, DC 20004; (202) 879-9655.

LODGING

Tight budget? We're on your side. We've gotten the best possible rates for October including discounts of 30% or more. GSA has blocked rooms at 12 downtown hotels that are offering special convention rates to GSA meeting attendees. These properties include a good cross section of lodging that should appeal to almost everyone's budget and taste. All meet GSA's standards for rate reliability, cleanliness, service, and location. The GSA shuttle will

not be servicing all 12 downtown hotels. Please refer to the shuttle information on page 179 or the individual hotel descriptions.

The most outstanding property in the resort class is GSA's headquarters, the Marriott Hotel & Marina, which is truly an impressive property. Immediately adjacent to the Convention Center and Seaport Village, it offers first-class services, dining, and a resort atmosphere right on San Diego Bay. A good value.

Over and above the 1000 rooms at the Marriott, there are 700 single rooms priced between \$70 and \$85, and 425 single rooms between \$50

and \$69. There is an excellent set of options within this group, including four-star properties and basic motels.

Student Housing. GSA has also negotiated convention rates with eight downtown and nearby Travelodge properties. These properties offer the least expensive rate in the GSA block. *They will not be serviced by the GSA shuttle service,* although some of these properties are near the GSA shuttle pick-ups or the San Diego trolley. You may need to provide your own transportation, but none of the properties are more than six miles from the convention center.

TO MAKE YOUR HOTEL RESERVATION

Fill out the Official Housing Request Form and either (1) mail it, or (2) fax it to the San Diego Housing Bureau. Please refer to the address and fax number shown on the Housing Request Form. All reservations must be RECEIVED BY FRIDAY, SEPTEMBER 27. Do NOT send your Housing Form in after you have faxed it. This will result in a duplicate reservation.

AFTER FRIDAY, SEPTEMBER 27, you should contact the GSA hotel of your choice directly. Note that many hotels will be filled at this time, and hotels will only be able to offer the special GSA rate on an as-available basis. Under no circumstance should they be offering a room at a higher rate. If you are interested in a suite, please call the hotel of your choice directly. The San Diego Housing Bureau will NOT be handling suite arrangements.

ASSIGNMENT

Hotel rooms will be assigned on a first-come, first-served basis as they are received by the Housing Bureau. Please list your top four choices in priority order. Remember to include the hotel code on the Housing Form with the hotel name. Once your request is received, the Bureau will send an acknowledgment to both you and to your assigned hotel.

You will then receive a confirmation from the hotel. This is a notice that the hotel received the information from the Bureau and that the reservation has been entered into their system. Please check it carefully.

ROOM DEPOSITS/ GUARANTEES

All GSA hotels require a first night's room deposit. Deposits can be made by (1) providing credit card information on the housing form, or (2) sending payment directly to the hotel once you have received your confirmation. The deposit amount should be the cost of one night's stay plus 9% tax at your assigned hotel. Note that the Housing Bureau will accept ONLY credit cards (American Express, VISA, MasterCard, Carte Blanche, or Diners Club), not checks or cash. When making payment directly to the hotel, be sure to give your confirmed reservation number. Please note that the Marriott requires a credit card guarantee at the time you make your reservation.

Once the hotel receives your deposit, it automatically guarantees your reservation. The guarantee assures you that no matter what time you arrive on your scheduled arrival day, your room will be held until at least midnight.

CHANGES AND CANCELLATIONS

Changes and cancellations BEFORE the SEPTEMBER 27 deadline should be communicated to the Housing Bureau, either by phone (619) 239-0271, fax 619-595-0216, or mail. Please supply your confirmed hotel reservation number for any change or cancellation. AFTER the SEPTEMBER 27 deadline, please contact the hotel directly with any changes.

GSA OFFICIAL HOUSING REQUEST FORM

Your Housing Request Form must be received BY FRIDAY, SEPTEMBER 27. Please complete and either:

1) **Mail to:** GSA Convention Housing
San Diego Convention & Visitors Bureau
1200 Third Avenue, Suite 824
San Diego, CA 92101

or

2) **Fax to:** San Diego Convention & Visitors Bureau/GSA Housing
1-619-595-0216

For changes and information call the San Diego Housing Bureau at (619) 239-0271.

HOTEL PREFERENCE: (Please print or type all information below)

Hotel Code #	Hotel Name
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____

TYPE OF ACCOMMODATION NEEDED:

_____ Single (1 person, 1 bed)	_____ 1 additional person	(For suites, call the hotel)
_____ Double (2 persons, 1 bed)	_____ 2 additional persons	
_____ Double/Double (2 persons, 2 beds)	_____ Add rollaway	

Rate requested \$ _____ (NOTE: All rooms are subject to 9% tax)

ARRIVAL DAY/DATE _____ TIME _____ a.m./p.m.

DEPARTURE DAY/DATE _____ TIME _____ a.m./p.m.

NAMES OF OCCUPANTS:

1. _____	3. _____
2. _____	4. _____

MAIL CONFIRMATION TO:

Name _____ Telephone (_____) _____
Address _____ City _____
State _____ ZIP _____ Country _____

GUARANTEED ROOM RESERVATION AUTHORIZATION:

All GSA hotels require a first night's deposit to make a reservation. I understand that the hotel may bill me for one night's housing if I fail to properly cancel a guaranteed reservation. Please check one:

_____ Credit card information is provided below to guarantee my reservation.
_____ My guarantee will be made directly to the hotel after I receive my hotel confirmation.
(This is not an option at the Marriott. The Marriott requires a guarantee when you make your reservation.)

Please guarantee my room reservation with the following:

_____ American Express _____ MasterCard _____ VISA _____ Carte Blanche _____ Diners Club

NAME (as listed on credit card) _____

SIGNATURE _____

CARD NUMBER _____ EXP. DATE _____

*** PLEASE DO NOT SEND CHECKS OR CASH WITH THIS FORM ***

Please note that a cancellation notice must be received AT LEAST 48 HOURS in advance to receive a full refund on your first night's room deposit. Please show courtesy as a professional by notifying the hotel if your plans change.

ALTERNATIVE HOUSING

Beating the high cost of housing is a priority of GSA staff and the 1991 Local Committee. Here are some alternatives:

- Check your library copy of the Hotel and Motel Redbook, which lists metro properties. Because of the hundreds of properties in the area (some good, some bad), GSA does not provide a general list.

- Call 1-800-555-1212 or check the Yellow Pages to learn the 800 number for your favorite hotel chains, such as Motel 8 or Comfort Inns, which have properties outside the downtown area.
- Consider camping or taking the trolley to/from nearby El Cajon. The Annual Meeting Committee has researched low-cost alternatives, including camping or other motels south of San Diego. Tent and RV campgrounds are available near the San Diego County foothills or on Mission Bay. Advance reservations are required, and nightly fees range from \$16 to \$30. For additional information, contact Vanessa George, GSA Meetings Coordinator.

1991 GSA HOTEL CONVENTION RATES

HOTEL NAME (HOTEL CODE)	1 person 1 bed	2 people 1 or 2 beds	3 people 2 beds	4 people 2 beds
SAN DIEGO MARRIOTT (117)* (1991 Headquarters)	\$125	\$139	\$159	\$179
RAMADA HOTEL DOWNTOWN (116)	\$ 80	\$ 80	\$ 80	\$ 80
HORTON GRAND HOTEL (108)	\$ 79	\$ 89	\$ 99	\$109
OMNI SAN DIEGO HOTEL (114)	\$ 95	\$115	\$125	\$135
KINGSTON HOTEL (105)	\$ 76	\$ 83	\$ 98	\$113
THE PAN PACIFIC HOTEL (104)	\$ 73	\$ 73	\$ 88	\$103
HOLIDAY INN ON THE BAY (106)*	\$ 85	\$ 95	\$105	\$115
BEST WESTERN BAYSIDE INN (101)	\$ 50	\$ 60	\$ 60	\$ 60
RADISSON HOTEL HARBOR VIEW (119)	\$ 69	\$ 69	\$ 69	\$ 69
HOLIDAY INN HARBOR VIEW (107)	\$ 65	\$ 75	\$ 75	\$ 75
HOWARD JOHNSON HOTEL (111)	\$ 61	\$ 61	\$ 66	\$ 71
COMFORT INN—DOWNTOWN (123)	\$ 50	\$ 50	\$ 55	\$ 60
TRAVELODGE (8 locations)	\$ 45	\$ 45	\$ 45	\$ 45

(*Additional \$10 for a guaranteed bay view)

DOWNTOWN SAN DIEGO

HOTELS (Hotel Code)

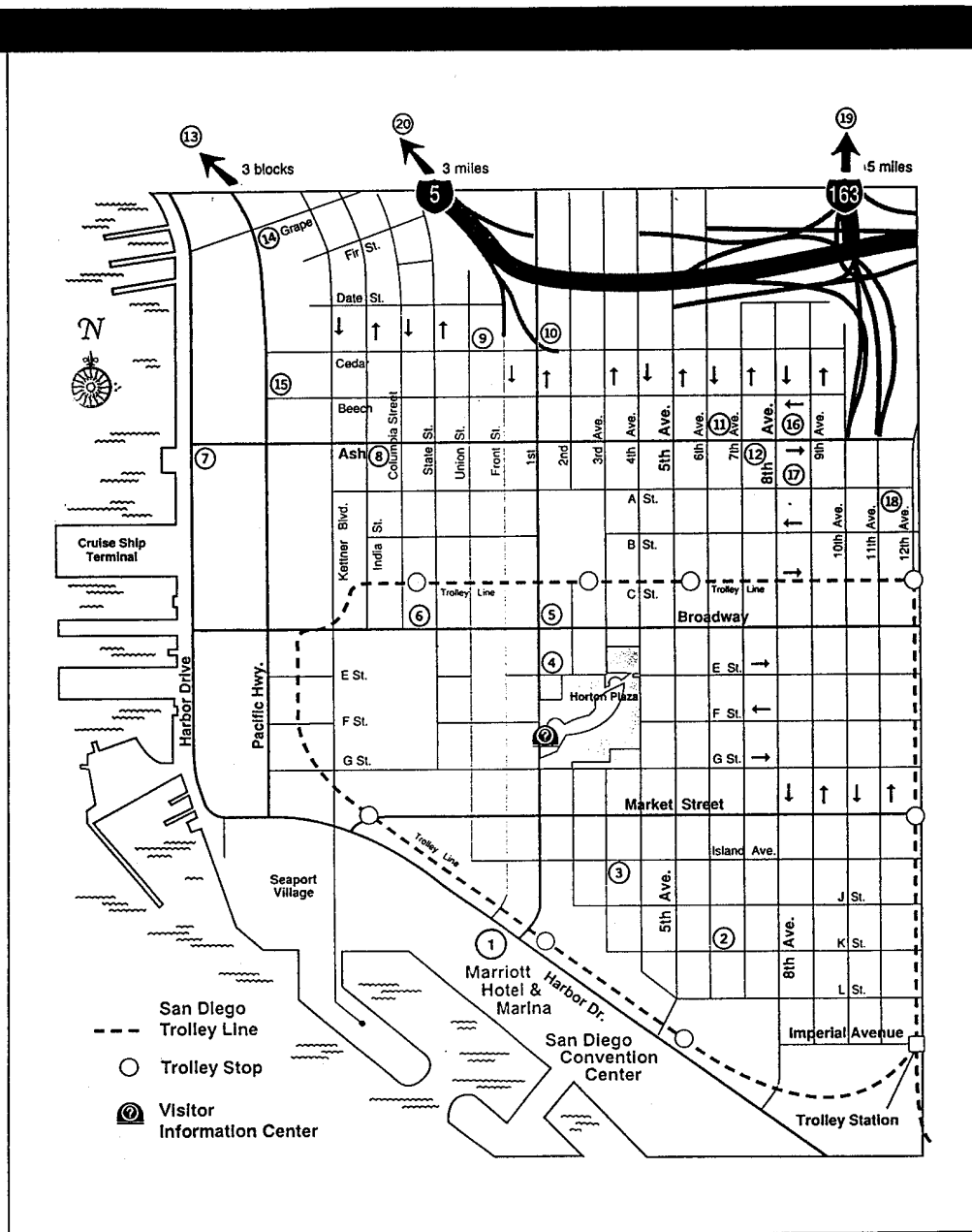
- GSA Shuttle Stop
- 1. Marriott Hotel & Marina (117)
- 2. Ramada Hotel Downtown (116)
- 3. Horton Grand Hotel (108)
- 4. Omni San Diego Hotel (114)
- 5. Kingston Hotel (105)
- 6. The Pan Pacific Hotel (104)
- 7. Holiday Inn on the Bay (106)
- 8. Best Western Bayside Inn (101)
- 9. Radisson Hotel Harbor View (119)
- 10. Holiday Inn Harbor View (107)
- 11. Howard Johnson Hotel—Balboa Park (111)
- 12. Comfort Inn—Downtown (123)

Travelodges—Student Properties

- 13. San Diego Airport Travelodge (124)
- 14. San Diego Bayview Travelodge (125)
- 15. Civic Center Travelodge (126)
- 16. San Diego Balboa Park (127)
- 17. San Diego Cabrillo Central (128)
- 18. At the Zoo Travelodge (129)
- 19. Mission Valley Center (416)
- 20. Old Town Travelodge (428)

PARKING

Convention Center public parking is available on the Fifth Street side under the Convention Center. A special \$4 rate, with no in and out privileges, will be available during the meeting, Monday through Thursday. Other days the cost will be \$1 per hour. A special exhibitor rate of \$6 per day will allow in and out access during move in, move-out, and show days. Please identify yourself as an exhibitor at the gate to qualify for this rate.



HOTEL LISTING

Please make your reservation with the San Diego Housing Bureau.

All hotel names are followed by a hotel code number. This code is required on the official housing form. Please note that all rooms are subject to 9% occupancy tax, and all hotels require a first night's deposit.



GSA shuttle stop

- 1 SAN DIEGO MARRIOTT HOTEL & MARINA (117)**
(1991 headquarters)
333 W. Harbor Drive, San Diego, CA 92101
(619) 234-1500 (1000-room block)
0 blocks from the Convention Center

Besides being the most convenient hotel to the Convention Center, it is also the finest major hotel in downtown San Diego. Located on the bay, the hotel features four restaurants for casual to elegant dining, two lounges offering cocktails and a beautiful view, and 24-hour room service. Recreational facilities include a serpentine outdoor pool and spa with fountains, rooftop tennis courts, complete fitness center, and more. Concierge, laundry, valet service, and gift shops. Underground, valet and self-parking start at \$4 per day. A *guaranteed* spectacular bay view is \$10 more; otherwise, your chances are 50/50. For this hotel only, a *credit card guarantee* is required at the time you send in your housing form.

Check-in: 4 p.m. Check-out: 12 noon
CC: AX,CB,D,DC,MC,V

- 2 RAMADA HOTEL DOWNTOWN (116)**
660 "K" Street, San Diego, CA 92101
(619) 696-0234 (150-room block)
3 blocks from the Convention Center

Complimentary shuttle service to and from the airport. Parking for hotel guests is \$4 per day. Enjoy the rooftop fitness center, including a spa overlooking San Diego Bay and the scenic skyline. Dine in the full-service restaurant for breakfast, lunch, and dinner, or enjoy the lobby lounge as you listen to light jazz from the baby grand piano.

Check-in: 3 p.m. Check-out: 12 noon CC: AX,DC,MC,V

- 3 HORTON GRAND HOTEL (108)**
311 Island Avenue, San Diego, CA 92101
(619) 544-1886 (100-room block)
3 blocks from the Convention Center

A 114-room Victorian hotel, built in 1886 and restored in 1986, set in the heart of San Diego's Gaslamp Quarter. All rooms are individually decorated with antiques including draped, queen-sized beds; hand-carved armchairs; lace curtains; and cozy gas fireplaces. English afternoon tea is served daily at 2:30 p.m. in the Palace Bar, award-winning Ida Bailey's serves breakfast and dinner with a sunny New Orleans-style courtyard view, and you can enjoy live jazz on weekends.

Check-in: 3 p.m. Check-out: 12 noon CC: AX,CB,D,DC,E,MC,V

- 4 OMNI SAN DIEGO HOTEL (114)**
910 Broadway Circle, San Diego, CA 92101
(619) 239-2200 (275-room block)
5 blocks from the Convention Center

Southwestern stucco, pastel hues, brass, and crystal combine to create a special hotel in the heart of downtown. Enjoy one of two restaurants, a quiet lounge, or nightclub, after using the outdoor pool, tennis, and exercise equipment. Immediately out the hotel door is Horton Plaza, a unique shopping, restaurant, and entertainment complex.

Check-in: 3 p.m. Check-out: 12 noon CC: AX,DC,MC,V

- 5 KINGSTON HOTEL (105)**
1055 First Avenue, San Diego, CA 92101
(619) 232-6141 (50-room block)
11 blocks from the Convention Center

With European corporate style, this hotel offers complimentary continental breakfast and use of a complete health club facility. The hotel is very proud of its intimate Kingston Playhouse Theater, one of San Diego's finest. Meals are served in Malcolm's, the hotel's restaurant and lounge. Enjoy the character in this graciously renovated property.

Check-in: 2 p.m. Check-out: 12 noon CC: AX,MC,V

- 6 THE PAN PACIFIC HOTEL (104)**
400 West Broadway, San Diego, CA 92101
(619) 239-4500 (100-room block)
9 blocks from the Convention Center

The newest property in downtown San Diego is a beautiful architectural landmark for the city skyline. All rooms feature marble bathroom, refreshment center, separate sitting area, and three phones for your convenience. Enjoy either of the two restaurants or the atrium lounge for cocktails and live music. Health center, complete with pool, spa, sundeck, sauna, massage, exercise equipment, and organized aerobics programs. Concierge service, same-day valet service, and complimentary airport shuttle.

Check-in: 3 p.m. Check-out: 12 noon CC: AX,DC,D,E,MC,V

- 7 HOLIDAY INN ON THE BAY (106)**
1355 North Harbor Drive, San Diego, CA 92101
(619) 232-3861 (250-room block)
14 blocks from the Convention Center

This is the only property besides the Marriott that is on San Diego Bay. Enjoy a stroll along the harbor and watch the cruise ships come and go. The hotel offers an outdoor pool and jacuzzi, lobby bakery, and lounge. The Holiday Inn has one restaurant that serves breakfast, lunch, and dinner at reasonable prices. You will enjoy the newly remodeled rooms, each having its own private balcony. A *guaranteed* bay view is \$10 more; otherwise you have a 50/50 chance.

Check-in: 3 p.m. Check-out: 12 noon CC: AX,CB,D,DC,MC,V

- 8 BEST WESTERN BAYSIDE INN (101)**
555 West Ash Street, San Diego, CA 92101
(619) 233-7500 (75-room block)
14 blocks from the Convention Center

This 14-story property has pleasant, comfortable rooms with private balconies to enjoy either a bay or city view. Complimentary features include parking, airport shuttle, local calls, HBO, and continental breakfast. Enjoy the pool and spa, full-service restaurant, cocktail lounge, and room service.

Check-in: 2 p.m. Check-out: 12 noon CC: AX,CB,D,DC,MC,V

- 9 RADISSON HOTEL HARBOR VIEW (119)**
1646 Front Street, San Diego, CA 92101
(619) 239-6800 (150-room block)
14 blocks from the Convention Center

A new property to grace the San Diego skyline, it offers both harbor and city views to take your breath away. Rooms offer rich wood decor, clock radios, and remote cable TV. Enjoy the hotel restaurant, which serves breakfast, lunch and dinner at reasonable prices, or the cocktail lounge. The hotel offers an outdoor pool, jacuzzi, sauna, health club, and complimentary airport shuttle.

Check-in: 3 p.m. Check-out: 12 noon CC: AX,CB,D,DC,MC,V

- 10 HOLIDAY INN HARBOR VIEW (107)**
1617 First Avenue, San Diego, CA 92101
(619) 239-6171 (75-room block)

14 blocks from the Convention Center. Pick up GSA shuttle at the Radisson.

Directly off Interstate 5, this 16-floor circular hotel affords stunning views of the San Diego harbor and skyline. Enjoy all meals in the casual rooftop restaurant. For relaxation, visit the quiet lounge or enjoy the outdoor pool. Each room has its own coffee maker. The hotel provides free parking to hotel guests.

Check-in: 3 p.m. Check-out: 12 noon CC: AX,CB,D,DC,MC,V

- 11 HOWARD JOHNSON HOTEL—BALBOA PARK (111)**
1430 Seventh Avenue, San Diego, CA 92101
(619) 696-0911 (75-room block)
12 blocks from the Convention Center

Located downtown, this hotel offers complimentary continental breakfast daily and free parking.

Check-in: 3 p.m. Check-out: 12 noon CC: AX,CB,D,DC,E,MC,V

- 12 COMFORT INN—DOWNTOWN (123)**
719 Ash Street, San Diego, CA 92101
(619) 232-2525 (50-room block)

12 blocks from the Convention Center. Pick up GSA shuttle at Howard Johnson.

Located downtown, this hotel offers complimentary continental breakfast daily and free parking.

Check-in: 3 p.m. Check-out: 12 noon CC: AX,CB,D,DC,E,MC,V

- 13-20 TRAVELODGE (8 locations)**
(300-room block)
0-6 miles from the Convention Center

These properties are basic and vary in distance from the Convention Center. If transportation is not a concern, you might choose to enjoy one of the nicer properties indicated by ♦, on page 181. All locations offer complimentary parking, morning coffee, and newspaper in the lobby.

Check-in: 3 p.m. Check-out: 12 noon CC: AX,CB,D,DC,MC,V

Following are the Travelodge properties and their unique characteristics.

13. San Diego Airport Travelodge (124)
2353 Pacific Highway
(619) 232-8931
2 miles from Convention Center
60-room block
Notes: free shuttle to airport,
free full continental breakfast
14. San Diego Bayview Travelodge (125)
1943 Pacific Highway
(619) 232-7551
1 mile from Convention Center
18-room block
15. Civic Center Travelodge (126)
1505 Pacific Highway
(619) 239-9185
1 mile from Convention Center
12-room block
16. San Diego Balboa Park (127)
840 Ash Street
(619) 234-8277
1 mile from Convention Center
23-room block
17. San Diego Cabrillo Central (128)
840 A Street
(619) 234-8477
1 mile from Convention Center
22-room block
18. At the Zoo Travelodge (129)
1267 Eleventh Avenue
(619) 232-7601
1 mile from Convention Center
20-room block
19. Mission Valley Center (416) ♦
1201 Hotel Circle South
(619) 297-2271
6 miles from Convention Center
85-room block. Note: pool
20. Old Town Travelodge (428) ♦
2380 Moore Street
(619) 291-9100
4 miles from Convention Center
60-room block
Notes: AAA rated, pool, jacuzzi,
VCR in all rooms, movie rental,
free full continental breakfast

Employment Opportunities in the Geological Sciences Roundtable Discussions

Beginning with the San Diego meeting, the annual forum on employment opportunities in the geosciences is being changed to allow more one-on-one interaction between panel members and individuals or small groups. Each of the experts listed below will conduct his or her own "mini-roundtable discussion" designed to provide a better opportunity to field both general and specific questions on a more personal, individualized basis.

These roundtable discussions will be in the Employment Service area, San Diego Convention Center, Room 1A, on Sunday, October 20, from 12:00 noon to 2:00 p.m. This is during the interview registration time; however, **YOU DO NOT HAVE TO BE SIGNED UP FOR EITHER THE EMPLOYMENT SERVICE OR THE**

ANNUAL MEETING TO PARTICIPATE IN THESE DISCUSSIONS. Everyone is encouraged to attend, professionals and students, to talk with as many of the experts as you like and to pick up a free copy of the 1991 booklet on *Future Employment Opportunities in the Geological Sciences*.

Roundtable discussion leaders scheduled are:
Dick Paull, University of Wisconsin-Madison
Kathy Duckett, John Mathes & Associates, Columbia, Illinois
Jon Price, Nevada Bureau of Mines & Geology, Reno
Bill Greenwood, U.S. Geological Survey, Reston, Virginia
Norm McIver, Shell Oil Company, Houston, Texas
Steve Stow, Oak Ridge National Laboratory, Oak Ridge, Tennessee
For further information contact T. Michael Moreland, Membership Services Manager at GSA headquarters.

TRAVEL

Getting to San Diego

By Air. San Diego International Airport—Lindbergh Field—is one of the few airports to be only 15 convenient minutes from the Convention Center. San Diego is currently served by Aero California, Air Resorts, Alaska Airlines, America West, American, Continental, Delta, Midwest Express, Northwest, Pan American, Sky West, Southwest, States West, Trans World, United, and USAir. Consider staying over Saturday night in San Diego for significant airfare savings.

GSA's official travel agent, Cain Travel Group, has negotiated excellent discounts with the major San Diego carriers. Cain can also assist you with the special discounts and coupon offerings in your area. Call today for the best availability.

To make a reservation, call Cain and identify yourself as a GSA traveler. Tickets can be paid for by check (payable to Cain Travel), by major credit card, or invoiced to your company. Final payment must reach Cain Travel no later than ten days prior to departure to allow for mailing time. All tickets will be mailed via certified mail upon receipt of payment unless requested otherwise. After tickets are issued, you are protected from fare increases; if a fare decreases, call Cain Travel for an adjustment.

As with all airline reservations, please use caution regarding change and cancellation penalties that accompany low-fare tickets. This especially applies to field trip participants whose trips may be canceled after the September 20 preregistration deadline. Be sure you understand the restrictions on the type of ticket you purchase.

Cain Travel will have an on-site Customer Service Desk at the San Diego Convention Center.

By Car. San Diego is about a 2-1/2-hour drive from downtown Los Angeles via freeway route Interstate 5, which stretches from Canada

to the Mexican border. Interstate 8 serves drivers from Yuma, Arizona, and beyond from the East Coast. Interstate 15 provides access from Nevada, Utah, Idaho, and Montana.

By Train and Bus. Amtrak passenger trains provide service to and from Los Angeles. Greyhound and Trailways provide bus service. Call the offices in your area to get the best rates.

Getting to Your Hotel

The San Diego International Airport—Lindbergh Field—is four miles from the San Diego Convention Center and the downtown area. Some GSA hotels have free shuttle pick-up, but other transportation options are as follows:

SuperShuttle. Operates 24 hours a day, seven days a week. To call SuperShuttle, dial 69 from the Ground Transportation Courtesy Board in the baggage claim area. A reservation agent will then give you instructions on where to board SuperShuttle. Look for the blue and yellow signs and vans. Cost: \$4 to the Marriott, \$6 to other downtown hotels.

From your hotel to the airport, call 24 hours in advance for reservations, (619) 278-8877. For your convenience, SuperShuttle vans are staged at the Marriott Hotel continuously throughout the day. SuperShuttle picks up at all hotels, but a reservation is necessary. Cost: \$4 from the Marriott, \$6 from other downtown hotels.

Taxis. Two hundred taxicab companies service the city of San Diego. This adds up to more than 1000 taxis, with the largest fleet belonging to Yellow Cab Company. All vehicles are metered and regulated. Charges are slightly higher from the airport than in the downtown area and range from \$1.20 to \$1.80 for the first mile. Approximate cost from the airport to downtown is \$8.

Metro Transit System (MTS). Board the Route 2 bus at the East Terminal of the San Diego Airport, request a transfer from the driver,



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Call CAIN TRAVEL GROUP Today

(official travel agency for the San Diego meeting)

Cain offers up to 50% off coach, will meet or beat any fare quote, and will handle at no extra charge the special discount fares advertised in your area.

1-800-346-4747 toll-free

(303) 443-2246 collect from outside U.S., 303-443-4485 fax
8:30 a.m.—5:30 p.m. MDT, Monday—Friday

You can't lose. Book today. If airfares drop, Cain will automatically reissue your ticket at the lower rate!

**COMPETITIVE RATES, REASONABLE ROUTING
GREAT SERVICE**

and ride to Columbia and Broadway. Disembark and walk across Broadway to the north side of the street and to the bus stop. Here board a Route 7 bus to the Convention Center. In San Diego, call 233-3004 for information. The cost from the airport to downtown is \$1.25.

Car Rental. Alamo is the official car rental agency for the meeting. Identify yourself as a GSA delegate by giving Group Identification #85204 and Plan Code G4 to get guaranteed, discounted, daily/weekly rates as follows: economy \$24/\$89; compact \$26/\$109; midsize \$28/\$129; standard \$30/\$149; luxury \$34/\$189. Unlimited mileage. Add \$3 per day for four-door models. Advance reservations are recommended. Call Alamo at 1-800-732-3232.

Getting Around in San Diego

An excellent freeway system makes travel by car or bus easy throughout the county. San Diego Transit Corporation buses serve the metro area. In San Diego, call the Transit Store, 233-3004, for schedule information.

San Diego Trolley. The modern San Diego Trolley provides an excellent, inexpensive service in the downtown area; between downtown and the Mexico border; and to San Diego's East County.

GSA Shuttle. GSA will operate a free shuttle service between the downtown GSA hotels and the San Diego Convention Center during meeting hours. (Reminder: the shuttle will not be servicing the student housing motels outside of the downtown area.) Shuttle service will be provided at frequent intervals each day (Sunday, October 20, through Thursday, October 24) beginning at 6:30 a.m. The shuttle will also operate on Sunday, Monday, and Tuesday evenings. Shuttle schedules will be posted in GSA hotel lobbies and in all registration packets.

FUTURE GSA ANNUAL MEETING SITES

Cincinnati	October 26-29, 1992
Boston	October 25-28, 1993
Seattle	October 24-27, 1994
New Orleans	November 6-9, 1995
Denver	October 28-31, 1996

1991 ABSTRACTS WITH PROGRAMS

Volume 23, Number 5

Complete this form and return it by Friday, September 13 for advance-copy purchases of Annual Meeting Abstracts with Programs. No refunds for duplicate orders. Members and nonmembers in U.S., Canada, and Mexico only. Price of \$20 includes shipment by first-class (priority) mail. Please copy this form for your records.

SHIP TO: _____ Check here if GSA Member
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Credit Card _____ Card Number _____ Expiration Date _____
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ADVANCE-COPY PURCHASE ORDERS MUST BE RECEIVED BY SEPTEMBER 13

Only members and nonmembers residing in the U.S., Canada, and Mexico may take advantage of GSA's advance-copy purchase option of the Annual Meeting Issue of *Abstracts with Programs*. These advance copies will be mailed about three weeks

prior to the meeting. The price of \$20 includes shipment by first-class (priority) mail.

Members and nonmembers residing outside the U.S., Canada, and Mexico: Due to the prohibitive costs of airmail postage and postal

delays in overseas mailing, we regret that we are unable to make this special advance-copy purchase offer available to you. Copies may be purchased at the meeting.

Refunds for duplicate orders will not be given. Members, check your

GRADUATE SCHOOL INTERVIEWS

Monday, October 21, through
Thursday, October 24
San Diego Convention Center

Shortcut your search for just the right graduate school program to suit your needs. Come to the San Diego Annual Meeting and meet with your favorite schools without spending the travel time and money to go to each school for interviews. The schools participating are listed below. Schedules will appear in the September issue of *GSA Today* and also the on-site San Diego Program.

If you would like to receive a complete list of schools with the contact persons and telephone numbers, so that you can set up an appointment individually or during the scheduled time in San Diego, please write or call Kathy Lynch, GSA Meetings Department.

CONVENIENCE INFORMATION

INFORMATION/MESSAGES

Friday, October 18, through
Thursday, October 24

San Diego Convention Center
(619) 525-6020
San Diego Marriott Hotel & Marina
(619) 234-1500

NEWS ROOM

Sunday, October 20, through
Thursday, October 24
San Diego Convention Center

The News Room provides information on topics for release to the

news media. Please let us know of material that is noteworthy for the science or general press. Also, members of the press may receive complimentary registration with appropriate press credentials. In advance of the meeting, contact Sandra Rush, (303) 443-8489, c/o Communications Dept., GSA headquarters.

CHILD CARE

Families should consider bringing their children to San Diego because of the variety of family activities in the area. Call Vanessa George, GSA Meetings Coordinator, if you are interested in the options provided:

- A private organization is interested in providing child care. They require a minimum of 12 children (6 weeks to 12 years old) at all times. Participants need to commit by paying in full in advance, with prices from \$8 to \$11 per hour, per child. Call GSA by September 15.
- GSA coordinates a cooperative service in which parents can share child care responsibilities. UNTIL OCTOBER 4, GSA will accept names, addresses, and phone numbers of interested parents. The information will be mailed to everyone who has responded. Participants should contact one another and make arrangements.
- San Diego has several excellent private child-care agencies. Although GSA cannot endorse any of these agencies, we are happy to give out the names and phone numbers.
- GSA will be providing a quiet room for children and parents to relax together at the Convention Center. Please provide your own stroller or playpen.

CALIFORNIA/SAN DIEGO INFORMATION

State of California, Visitor Packet
1-800-862-2543

San Diego Visitor Information Center
11 Horton Plaza, San Diego,
CA 92101, (619) 236-1212

REGISTRATION

JOIN GSA NOW AND SAVE!

If you're planning to attend this year's Annual Meeting—but are not yet a GSA member—now is the time to join! When you do, the \$40 basic dues you pay will equal the \$40 you'll save on the member registration fee for the meeting. It's like joining GSA for free. Even professional registrants who pay the *nonmember* registration fee and apply for membership by March 31, 1992, can take advantage of this opportunity. Simply attach a copy of your meeting registration form to your membership application and submit it to GSA headquarters.

Likewise, students who pay the basic membership dues of \$15 to become a Student Associate will receive a \$20 discount on their Annual Meeting registration. That's better than becoming a GSA Student Associate for free!

The \$40 registration discount for members applies to professional members of GSA or an Associated Society. The Associated Societies that qualify are on the registration form. Save time by joining *before* the meeting... membership applications are available from GSA headquarters. During the meeting, they can be picked up at the Membership Booth in the registration area of the San Diego Convention Center.

records carefully to make sure that you have not previously purchased a copy of this publication on either your dues statement or through GSA Publication Sales.

TO PLACE YOUR ORDER

Prepayment is required.

Check, money order (in U.S. funds, payable on U.S. banks), or major credit cards are accepted for payment. Order directly from GSA Publication Sales by mail, phone, or fax. To assure receipt prior to the meeting, *all orders must be received by Friday, September 13.*

By mail...

Use the form provided.

By phone or fax...

Call us toll-free at 1-800-472-1988 (outside Colorado), or use our standard business phone (303) 447-2020 during office hours (8:00 to 4:30 MT). You may also fax your order to us at 303-447-1133 (24-hour line).

ON-SITE PURCHASE

Meeting attendees may purchase copies of *Abstracts with Programs* on-site in the registration area of the Convention Center. Net price: \$20, while supply lasts.

PREREGISTER TODAY! PREREGISTRATION DEADLINE: SEPTEMBER 20

1. There is a 14% savings in registration fees if you register before the preregistration deadline! Advance registration is suggested for many of the special activities because of participation limits. Use the preregistration form provided in this announcement.
2. Badges must be worn for access to ALL activities and shuttle 10:00 a.m. Sunday through 5:00 p.m. Thursday.
3. Registration discounts are given to GSA or Associated Society members. Associated Societies that qualify for this discount are indicated on the registration form. Please indicate your affiliation(s) and member number and register using the member rates.
4. Full payment MUST accompany registration. Unpaid purchase orders are NOT accepted as valid registration. Charge cards are accepted as indicated on preregistration form. Please recheck the charge card number given—errors will delay your registration. The confirmation card will be your receipt for charge card payments. No other receipt will be sent.
5. Register one professional or student per form. Copy the form for your records.
6. Guest registration is required for guests attending guest activities, technical sessions, or the exhibit hall. Guest registrants MUST be accompanied by either a registered professional or student.



7. CURRENT student ID is required to obtain student rates at both the on-site and preregistration counters. Students not carrying a current student ID when they arrive to pick up registration materials will be required to pay the professional fee.

CANCELLATIONS, CHANGES, REFUNDS

All requests for registration additions, changes, and cancellations must be made in writing and received by September 27. NO REFUNDS WILL BE MADE ON CANCELLATION NOTICES RECEIVED AFTER THIS DATE. Refunds will be mailed from GSA after the meeting. Refunds for fees paid by credit card will be credited according to the card number on the preregistration form. NO refunds for on-site registration and ticket sales.

ON-SITE REGISTRATION SCHEDULE

SAN DIEGO CONVENTION CENTER, HALL B

- Friday, October 18
 - * 1:00 p.m. to 5:00 p.m.
- Saturday, October 19
 - * 7:30 a.m. to 2:00 p.m.
 - 12:00 noon to 2:00 p.m.
- Sunday, October 20
 - 10:00 a.m. to 7:00 p.m.
- Monday, October 21
 - 7:30 a.m. to 5:00 p.m.
- Tuesday, October 22
 - 7:30 a.m. to 4:00 p.m.
- Wednesday, October 23
 - 7:30 a.m. to 2:00 p.m.
- Thursday, October 24
 - 7:30 a.m. to 11:30 a.m.

* PREREGISTRANTS ONLY!

REGISTRATION FEES

	Advance (by Sept. 20)	On-Site	One-Day
Professional—Member	\$140	\$160	\$ 80
Professional—Nonmember	\$180	\$200	\$100
Student—Member	\$ 55	\$ 65	\$ 33
Student—Nonmember	\$ 75	\$ 85	\$ 43
Guest	\$ 60	\$ 70	N/A

SPECIAL EVENTS

San Diego Welcoming Reception

Sunday, October 20, 6:00 to 9:00 p.m.
San Diego Convention Center,
Outdoor Terrace

Ocean sunset, and later, night lights along the shoreline; salt-laden sea breeze; halarys clanging against masts; Latin jazz to fit the mood. Welcome to San Diego! This is the time and place to be with friends and colleagues. You're on your own for drinks and your choices of pizza, tacos, and fajitas made available for everyone, including those late arrivals from field trips. The Latin-Caribbean-African band promises welcome sounds with a global perspective.

For your convenience, registration will be open until 7:00 p.m. Shuttle buses will be servicing the GSA hotels from the Convention Center until 9:30 p.m. If you plan to go out for dinner, we suggest you make reservations. A dining guide will be available with registration, or ask your hotel concierge.

GSA Presidential Tribute and Awards Ceremony

Tuesday, October 22, 5:45 to 7:00 p.m.
San Diego Convention Center

The San Diego Meeting is dedicated to the memory of our friend and leader, Doris M. Curtis, who died on May 26. During the ceremonies, we will celebrate the life of this exceptional person. (Although E-an Zen has assumed the duties of President, there will not be a Presidential Address this year.)

Following the Tribute, 1991 medalists and awardees will be honored:

Penrose Medal

William R. Dickinson

Day Medal

Ian S. E. Carmichael

Young Scientist Award (Donath Medal)

Brian P. Wernicke

GSA Distinguished Service Award

Dorothy M. Palmer

Recognition will also be given to newly elected Honorary Fellows Dr. Valdar Jaanusson, Dr. Hans Laub-scher, and Dr. Richard L. Stanton.

PREREGISTRATION FORM 1991 GSA Annual Meeting October 21-24

Please print • Copy for your records • Shaded areas are for your badge.

Name (Last) _____ (First) _____ Initial _____
 Employer/University/Affiliation (for badge) _____
 Mailing address of affiliation/employer indicated above _____
 City _____ State _____ ZIP code _____
 Country _____ Business phone _____ Home phone _____
 Guest/Spouse Name (Last) _____ (First) _____
 City _____ State/Country _____

PERSONAL PROFILE (Optional) Please check all that apply: Male Female AGE 18-24 25-34
 EMPLOYED AS 01/Professor/Asst. Professor 02/Teacher/Instructor/TA 35-44 45-54
 03/Manager/Administrator 04/Government Geologist 55-65 over 65
 05/Corporate Geologist 06/Other
 Circle member affiliations: (A) GSA (Member # _____) (B) CF (C) GS (D) GIS
 (E) MSA (F) NAGT (G) PS (H) SEG (I) AWG (J) SGE (K) AGID (L) SVP (M) NESTA

REGISTRATION FEES	(PLEASE CHECK ONE)	Full 5 Days	or	1 Day	Qty	Column A Amount
Professional Member	<input type="checkbox"/>	(1) \$140	<input type="checkbox"/>	(2) \$ 80		
Professional Nonmember	<input type="checkbox"/>	(3) \$180	<input type="checkbox"/>	(4) \$100		
Student Member	<input type="checkbox"/>	(5) \$ 55	<input type="checkbox"/>	(6) \$ 33		
Student Nonmember	<input type="checkbox"/>	(7) \$ 75	<input type="checkbox"/>	(8) \$ 43		
Guest (fill in name above for badge)	<input type="checkbox"/>	(9) \$ 60		N/A		

GUEST ACTIVITIES	Date	Qty	Amount
Wild Animal Park, Adult	Oct. 20	(20)	\$ 33
Wild Animal Park, Child	Oct. 20	(21)	\$ 25
Best of San Diego Tour and Harbor Cruise	Oct. 20	(22)	\$ 23
Tijuana, Mexico Shopping and Lunch	Oct. 21	(23)	\$ 35
Gaslamp Tour and High Tea	Oct. 21	(24)	\$ 20
Zoo Behind-the-Scenes Tour, Adult	Oct. 22	(25)	\$ 35
Zoo Behind-the-Scenes Tour, Child	Oct. 22	(26)	\$ 25
La Jolla Lunch and Shopping	Oct. 22	(27)	\$ 37
Presidio Park and Old Town Lunch, Adult	Oct. 23	(28)	\$ 34
Presidio Park and Old Town Lunch, Child	Oct. 23	(29)	\$ 29

SPECIAL EVENTS	Date	Qty	Amount
Tennis Tournament	Oct. 20	(40)	\$ 22
Dinner Cruise	Oct. 22	(45)	\$ 38
Beach Party—Dance the Night Away	Oct. 22	(56)	\$ 17
SK Run (check T-Shirt Size <input type="checkbox"/> M <input type="checkbox"/> L <input type="checkbox"/> XL)	Oct. 23	(41)	\$ 18
Mexico Evening	Oct. 23	(46)	\$ 37

TICKETED MEAL FUNCTIONS	Date	Qty	Amount
Assoc. Women Geoscientists Division Luncheon	Oct. 20	(60)	\$ 19
Engineering Geology Division Luncheon	Oct. 21	(61)	\$ 19
Geochemical Society Luncheon	Oct. 21	(62)	\$ 19
Geoscience Information Society Luncheon	Oct. 21	(63)	\$ 19
Geophysics Division Luncheon	Oct. 22	(64)	\$ 19
History of Geology Division Luncheon	Oct. 22	(65)	\$ 19
Hydrogeology Division Luncheon	Oct. 22	(66)	\$ 19
Mineralogical Society Luncheon	Oct. 22	(67)	\$ 19
National Association Geology Teachers Luncheon	Oct. 22	(68)	\$ 19
Paleontological Society Luncheon	Oct. 22	(69)	\$ 19
Sedimentary Geology Division Continental Breakfast	Oct. 22	(70)	\$ 8
Assoc. Women Geoscientists Annual Breakfast	Oct. 22	(71)	\$ 13
Coal Geology Division Luncheon	Oct. 23	(72)	\$ 19
Geoscience Education Division Luncheon	Oct. 23	(73)	\$ 19
Society of Economic Geologists Luncheon	Oct. 23	(74)	\$ 19
Total Column A			\$

FIELD TRIPS	Date	Qty	Amount
1 Mesozoic and Cenozoic Evolution, Mojave	Oct. 16-20	(100)	\$260
2a Coal-bearing Delta Complexes, SW US	Oct. 16-19	(101)	\$290
2b Coal-bearing, Overflight only	Oct. 20	(102)	\$750
3 Miocene to Holocene, Recent Ext. Tectonics, Baja	Oct. 18-20	(103)	\$190
4 Plate Tectonic History, Central California	Oct. 18-20	(104)	\$255
5 Submarine-Fan Deposits	Oct. 19	(105)	\$ 45
6a Geologic Hazards	Oct. 20	(106)	\$ 60
7a Igneous Features, Smartville Complex	Oct. 18-20	(107)	\$195
7b Igneous Features w/air to San Diego	Oct. 18-20	(108)	\$358
8 Tectonic Evolution, Central Death Valley	Oct. 18-20	(109)	\$240
9 Gem-bearing Pegmatites	Oct. 18-20	(110)	\$225
10a Lower Cambrian Death Valley & Mojave Desert	Oct. 17-20	(111)	\$260
10b Lower Cambrian Death Valley w/air to San Diego	Oct. 17-20	(112)	\$309
11 Algodones Dune Field	Oct. 18-19	(113)	\$250
12 Active Folding and Faulting, Transverse Ranges	Oct. 18-20	(114)	\$245
13 Mesozoic Evolution, San Gabriel Mountains	Oct. 19-20	(115)	\$150
14 Quaternary Geomorphology, Owens Valley	Oct. 17-20	(116)	\$255
15a Active Faulting Volcanism in Trans-Mexican	Oct. 16-20	(117)	\$265
15b Active Faulting Volcanism w/air to San Diego	Oct. 16-20	(118)	\$447
16 Tectonics, Water, and Politics	Oct. 17-20	(119)	\$280
17 Archaeological Geology, Point Conception	Oct. 18-20	(120)	\$160
18 Geology of San Diego (check day/time below)	Oct. 22 or 23	\$ 10	\$
Tues. a.m. <input type="checkbox"/> (121) Tues. p.m. <input type="checkbox"/> (122) Wed. a.m. <input type="checkbox"/> (123) Wed. p.m. <input type="checkbox"/> (124)			
19 Downtown San Diego Blob	Oct. 23	(125)	\$ 5
20 Remote Sensing Planetology at JPL	Oct. 25	(126)	\$ 25
21 Catalina Schist	Oct. 25-27	(127)	\$325
22 Peninsular Ranges Batholith	Oct. 25-27	(128)	\$260
23a Zoned Plutons, E. Peninsular Ranges, Baja 2 days	Oct. 25-26	(129)	\$145
23b Zoned Plutons, E. Peninsular Ranges, 5 days	Oct. 25-29	(130)	\$360
24 Mesozoic Geology, Cedros Island, Baja, Mexico	Oct. 25-28	(131)	\$510
25 Eocene Depositional Systems	Oct. 25-26	(132)	\$140
26 Landslides, Peninsular Ranges, S. California	Oct. 25-26	(133)	\$190
27 Geologic Structure, Salton Trough	Oct. 24-26	(134)	\$230
28 Late Cenozoic Sedimentation, Salton Trough	Oct. 24-27	(135)	\$275
29a Hydrogeologic Overview, Yucca Mountain, Nevada	Oct. 25-27	(136)	\$180
29b Hydrogeologic Overview, Yucca Mountain, w/air to Nev.	Oct. 25-27	(137)	\$258
30 Detachment Faulting, Whipple Mountains	Oct. 24-27	(138)	\$245

SHORT COURSES	Date	Qty	Amount
1 Practical 3-D Contaminant Transport Modeling	Oct. 18-20	(150)	\$295
2 SUPCRT91 Software Package	Oct. 18-19	(151)	\$295
3 Deformation & Kinematics, High Strain Zones	Oct. 19-20	(152)	\$175
4 Fractals and Their Use in Earth Sciences	Oct. 19-20	(153)	\$255
5 Quantitative Sedimentary Basin Modeling	Oct. 19-20	(154)	\$165
6 Thermochronology: Applications to Tectonics	Oct. 19-20	(155)	\$215
7 Assessing Mobility, Chemicals Vadose Zone	Oct. 20	(156)	\$105
8 Computer-aided Illustration in Geology	Oct. 20	(157)	\$295
9 Earthquakes and Earthquake Preparedness	Oct. 20	(158)	\$105
10 Hydrogeologic & Environmental Applications	Oct. 20	(159)	\$120
11 Applications, Radar Remote Sensing	Oct. 25	(160)	\$135
12 Contaminant Hydrogeology	Oct. 25-26	(161)	\$195
13 Sedimentary Basin Systems	Oct. 25-26	(162)	\$145

*Meeting registration not required
 Columns A & B = Total Remittance (full payment must be enclosed) \$

Remit in U.S. funds payable to: 1991 GSA Annual Meeting
 Payment by (check one):
 Cash/Check American Express VISA MasterCard Expires _____
 Diners Club/Carte Blanche
 Card Number _____
 Signature _____
 Preregistration Deadline: September 20, 1991
MAIL TO: GSA ANNUAL MEETING, P.O. BOX 9140, BOULDER, CO 80301

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