

The Geochemical News

Biannual Newsletter of the Geochemical Society

Number 68

September 1985

Officers for 1986

President: Stanley R. Hart, Massachusetts Institute of Technology
Vice President: Larry A. Haskin, Washington University, St. Louis
Past President: Hubert L. Barnes, The Pennsylvania State University
Secretary: Bryan Gregor, Wright State University
Treasurer: Peter Deines, The Pennsylvania State University
Councilors: A. E. Bence, J. I. Drever, G. Faure, W. T. Holser, Cindy Lee,
R. O. Rye, W. Stumm, R. Wollast
Editors: Denis M. Shaw (Geochimica et Cosmochimica Acta); Bryan Gregor (The Geochemical News)
Organic Geochemistry Division: Chairman, Robert Gagosian, Woods Hole Oceanographic Institution; Secretary, Cindy Lee, Woods Hole Oceanographic Institution

Meetings and Symposia

GEOCHEMICAL SOCIETY 1985 ANNUAL MEETING in conjunction with the Annual Meeting of the Geological Society of America, Orlando, Florida, 27 through 31 October. Hotel reservation deadline October 4 (reservation form on p. 8); preregistration deadline September 27 (registration form on p. 9). For further information see GSA News and Information for August 1985, or apply to GSA Meetings Department, P.O. Box 9140, Boulder CO 80301, Tel. 303-447-2020.

Sunday, Oct. 27

GS ORGANIC GEOCHEMISTRY DIVISION SYMPOSIUM:
GEOCHEMICAL FOSSILS: PRECAMBRIAN TO RECENT
2 Jasmine, Convention Center, 1:00 p.m.

John Zumberge and Robert Gagosian, presiding

1 Philip A. Meyers*: GEOLIPID CONTENTS OF LAKE SEDIMENTS: AN HISTORICAL RECORD OF LACUSTRINE AND WATERSHED BIOTA OVER QUATERNARY TIMES [79444]*..... 1:00 P

2 John W. Farrington*, Robert B. Gagosian, Alan C. Davis, John K. Volkman: COMPARISON OF TERRIGENOUS AND MARINE LIPID BIOMARKER "PRESERVATION" IN RECENT SEDIMENTS [79450]..... 1:30 P

3 M.H. Engel*, S.A. Macko: THE ORGANIC GEO-CHEMISTRY OF AMINO ACIDS: PRECAMBRIAN TO RECENT [79452]..... 2:00 P

4 J. William Louda*, Earl W. Baker: TETRA-PYRROLE PIGMENTS IN THE GEOLOGIC RECORD [79455]..... 2:30 P

5 Jurgen H. Rullkötter*: BIOLOGICAL MARKER COMPOSITION OF CRUDE OILS IN RELATION TO THE GEOTHERMAL HISTORY OF THEIR SOURCE ROCKS [79449] 3:00 P

6 R.P. Philp*: THE BIOMARKERS PRESENT IN ASPHALTENES [77989]..... 3:30 P

7 Susan E. Palmer*: ORGANIC GEOCHEMISTRY OF MID-CONTINENT ORDOVICIAN OILS [79457]..... 4:00 P

8 Bartholomew Nagy*: CONSTRAINTS ON THE EVOLUTION AND NATURE OF COMPLEX PRE-CAMBRIAN ORGANIC SUBSTANCES [79442]..... 4:30 P

ORGANIC GEOCHEMISTRY DIVISION 25TH ANNIVERSARY DINNER, Tangerine B, Marriott Inn, Sunday, October 27, Cocktails 6:30, Dinner 7:30-10:30. Guest speaker John Hunt.

*Abstract No. - refer to GSA Abstracts with Programs

Monday, Oct. 28

IGNEOUS PETROLOGY I: GEOCHEMISTRY OF MAFIC/
ULTRAMAFIC ROCKS AND EVOLUTION OF PRECAMBRIAN
TERRANES

8AB Orange Blossom, Convention Center, 8:00 a.m.

Paul W. Weiblen and Peter I. Nabelek, presiding

- 1 Ian D. MacGregor*: THE ROBERTS VICTOR ECLONGITES: ANCIENT OCEANIC CRUST? [68220]..... 8:00 A
- 2 J.W. Shervais*: MAGMATIC/METASOMATIC AMPHIBOLE IN THE MANTLE: EVIDENCE FROM THE BALMUCCIA LHERZOLITE MASSIF, IVREA ZONE, WESTERN ITALIAN ALPS [79521]..... 8:15 A
- 3 (Withdrawn)..... 8:30 A
- 4 Craig M. Schiffries*, Robert F. Dymek: CALCIC MYRMEKITE IN ANORTHOSITIC AND GABBROIC ROCKS [71607]..... 8:45 A
- 5 K.A. Mihm*, R.L. Nielsen: GEOCHEMISTRY AND PETROGENESIS OF THE BELMONT DIABASE SHEET, NORTHERN CULPEPER BASIN, VIRGINIA [72038]..... 9:00 A
- 6 David Gottfried*, Paul C. Ragland, A.J. Froelich: STYLES OF DIFFERENTIATION OF SOME MESOZOIC DIABASE SHEETS IN THE EASTERN UNITED STATES [71726]..... 9:15 A
- 7 David N. Shirley*, Paul H. Warren: DIFFERENTIATION OF THE PALISADES SILL [64208]..... 9:30 A
- 8 J. Warner Cribb*, John F. Lewis: PETROLOGY AND GEOCHEMISTRY OF THE EASTERN LOMA DE CABRERA BATHOLITH, DOMINICAN REPUBLIC [68202]... 9:45 A
- 9 O.D. Hermes*, D.P. Murray: CRUSTAL EVOLUTION OF THE NEW ENGLAND AVALON ZONE AS INDICATED BY TEMPORAL COMPOSITIONAL VARIATIONS OF IGNEOUS ACTIVITY [71889]..... 10:00 A
- 10 B.E. Faggart, Jr.*, A.R. Basu, M. Tatsumoto: Sm-Nd STUDY OF THE SUDBURY COMPLEX, ONTARIO [63196]..... 10:15 A
- 11 Karl E Seifert*, Zell E. Peterman, Kenneth E. Windom: MINERAL LAKE LAYERED INTRUSION, NW WISCONSIN [77444]..... 10:30 A
- 12 James D. Miller, Jr.*, Paul W. Weiblen: COMPARATIVE PETROGENESIS OF ANORTHOSITIC AND TROCTOLITIC SERIES ROCKS OF THE DULUTH COMPLEX, MINNESOTA [64703]..... 10:45 A
- 13 K.J. Spencer*, G.N. Hanson, M.F. Horan: GENERATION OF GRANITIC BATHOLITHS ALONG A PROPOSED PROTEROZOIC CONTINENTAL MARGIN IN EAST-CENTRAL MINNESOTA [73191]..... 11:00 A
- 14 G. Wesley McCall*, Peter I. Nabelek, Robert L. Bauer, Michael D. Glascock: ORIGIN AND INTERACTION OF SOME ALKALIC AND SILICIC PLUTONS IN THE VERMILION GRANITIC COMPLEX, NE MINNESOTA [64597]..... 11:15 A

POSTER SESSION: GENERAL GEOCHEMISTRY AND
HYDROGEOLOGY

North Hall, Convention Center, 8:00 a.m. - 11:30 a.m.

Authors will be present from 9:00 a.m. - 11:00 a.m.

- Samuel B. Mukasa*, Barbara A. Barreiro:
Pb, Nd AND Sr ISOTOPIC COMPOSITIONS OF
FELDSPAR, APATITE AND SPHENE AS A GUIDE
TO THE NATURE OF THE SUB-ANDEAN MANTLE
AND CRUST-MANTLE INTERACTION IN THE
COASTAL BATHOLITH, PERU [79233]..... Booth 3

- Holly J. Stein*, Paul D. Fullagar: ORIGIN OF
COLORADO MINERAL BELT LARAMIDE-TERTIARY
MAGMATISM: LEAD AND STRONTIUM ISOTOPE
EVIDENCE [76020]..... Booth 4
- H.F. Shaw*, S. Niemyer: AGES AND Nd, Sr
ISOTOPIC SYSTEMATICS IN THE SIERRAN
FOOTHILLS OPHIOLITE BELT, CA: THE
SMARTVILLE AND FEATHER RIVER
COMPLEXES [78488]..... Booth 5
- Richard J. Walker*, Larry J. Moore: RESONANCE IONIZATION MASS SPECTROMETRY (RIMS) FOR THE MEASUREMENT OF MULTI-ELEMENT CONCENTRATIONS AND Re-Os ISOTOPES IN CRUSTAL ROCKS [75854]..... Booth 6
- Gene Simmons*, Louis J. Caruso: URANIFEROUS ACCESSORY PHASES IN GRANITES [75557] Booth 7
- Louis J. Caruso*, Gene Simmons: URANIFEROUS MICROCRACKS IN GRANITES [75568]..... Booth 8
- Yuch-Ning Shieh*, Ingolf J. Rui, Gunnar Kullerud: STABLE ISOTOPE STUDIES OF STRATABOUND ORES AND WALL ROCK ALTERATIONS AT KILLINGDAL MINE, CENTRAL NORWEGIAN CALEDONIDES [78147]..... Booth 9
- Robert A. Zielinski*, Charles A. Bush, John N. Rosholt: URANIUM SERIES DISEQUILIBRIUM IN A HOLOCENE URANIUM DEPOSIT IN NORTHEASTERN WASHINGTON [77219]..... Booth 10
- Kerri L. Nelson*: COMBINED ELEMENTAL AND ISOTOPIC EVALUATION OF A DEEP-WATER CARBONATE: IMPLICATIONS FOR A DYNAMIC DIAGENETIC MODEL [78289]..... Booth 11
- Enriqueta Barrera*, Samuel M. Savin: CARBONATE DIAGENESIS AND THE UTILITY OF O18/O16 RATIOS OF PALEOGENE FORAMINIFERA IN PALEOCLIMATIC STUDIES [56004]..... Booth 12
- Linda M. Bonnell*, Thomas F. Anderson: SULFUR ISOTOPIC ANALYSES OF DISSEMINATED PYRITE IN CRETACEOUS BLACK AND GREEN MUDSTONES [69585]..... Booth 13
- K.J. Miskell-Gerhardt*, R.B. Dunbar: TRACE ELEMENT CRITERIA FOR SELECTING UNALTERED INOCERAMIDS FOR PALEOTEMPERATURE STUDIES [72447]..... Booth 14
- R.J. Bodnar*, C.W. Burnham, J.G. Blencoe: PVT PROPERTIES OF H2O-NaCl MIXTURES AT HIGH TEMPERATURES AND PRESSURES [79248]..... Booth 15
- Kevin G. Knauss*, W.J. Beiriger, D.W. Peifer, A.J. Piwinski: HYDROTHERMAL INTERACTION OF SOLID WAFERS OF TOPOPAH SPRING TUFF WITH GROUND WATER AND DISTILLED WATER AT 90 DEGREES C USING DIXON-TYPE, GOLDBAG ROCKING AUTOCLAVES [64114]..... Booth 16
- James R. Burnell*, Jonathan Myers, David G. Coles: EXPERIMENTAL STUDY OF THE INTERACTIONS OF NUCLEAR WASTE WITH POTENTIAL WASTE PACKAGE COMPONENTS FROM HANFORD SITE, WA [76787]..... Booth 17
- L.L. Chyi*, A.N. Garg: THE FRACTIONATION OF Zr AND Hf IN SURFACE PROCESSES [77710]..... Booth 18
- Brian G. Katz*, Owen P. Bricker, Margaret M. Kennedy: GEOCHEMICAL MASS-BALANCE RELATIONSHIPS FOR SELECTED CONSTITUENTS IN PRECIPITATION AND STREAM WATER, CATOCTIN MOUNTAINS, MARYLAND [75859]..... Booth 19
- Bruce W. Nelson*, I.S.A. Nather Kahn: TRACE METAL SOURCES IN TWO MALAYSIAN ESTUARIES [72464]..... Booth 20
- P.E. Dresel*, A.W. Rose, C.H. Gammons: GEOCHEMISTRY AND ORIGIN OF BRINES FROM WESTERN PENNSYLVANIA [74681]..... Booth 21

- Thure E. Cerling*, Thomas C. Johnson, John D. Halfman, G. Lister: PORE WATER CHEMISTRY OF AN ALKALINE RIFT VALLEY LAKE: LAKE TURKANA, KENYA [69720]..... Booth 22
- Carl O. Moses*, D. Kirk Nordstrom, Janet S. Herman, Aaron L. Mills: INITIATION OF AQUEOUS PYRITE OXIDATION BY DISSOLVED OXYGEN AND BY FERRIC IRON [69943]..... Booth 23
- S.F. Bianchetti*, R.J. Reeder: VARIABLE DISSOLUTION RATES OF DEFORMED AND UNDEFORMED CALCITE [77766]..... Booth 24
- Harry H. Posey*, R. Stephen Fisher, Susan D. Hovorka, Laura A. Elliott: DIAGENESIS OF EARLY PERMIAN EVAPORITES AND CARBONATES, PALO DURO BASIN, TEXAS [79312]..... Booth 25
- D.H. Rezaiek*, D.T. Long: A TECHNIQUE FOR CHARACTERIZING TRACE METAL BEHAVIORS IN AQUEOUS SYSTEMS [77354]..... Booth 26
- Elizabeth A. Zbinden*, Heinrich D. Holland: AN ARCHEAN PALEOSOL BELOW THE DOMINION REEF GROUP, SOUTH AFRICA [59349]..... Booth 27
- G. Muyzer, P. Westbroek, J. Wehmiller*: IMMUNOLOGY OF MACROMOLECULES FROM QUATERNARY MERCENARIA SAMPLES FROM THE ATLANTIC COASTAL PLAIN [65993]..... Booth 28
- A.B. Hull*, A. Lerman: PARTITIONING IN THE GLOBAL CYCLES OF MICRONUTRIENT ELEMENTS [77624]..... Booth 29
- S.A. Macko*, D.E. Ivany, K. Pulchan: ORGANIC GEOCHEMISTRY OF BAFFIN ISLAND FJORDS [79451]..... Booth 30
- Nancy C. Lee, Jeffrey L. Bada*: EXTRATERRESTRIAL AMINO ACIDS AT THE CRETACEOUS-TERTIARY BOUNDARY [73031]..... Booth 31
- David J. Des Marais*, Etta Peterson, Emil Kwong: ORGANIC $\delta^{13}C$ VARIES SLIGHTLY WITH SALINITY IN MICROBIAL MATS AT GUERRERO NEGRO, BAJA CA, MEXICO: IMPLICATIONS FOR STROMATOLITE ^{13}C VALUES [73298]..... Booth 32
- Steven C. Kornder*, John R. Carpenter: APPLICATION OF A LINEAR UNMIXING ALGORITHM TO SELECTED LIPIDS OF RECENT SALT MARSH SEDIMENTS [77616]..... Booth 33
- J.V. Bonilla*, M.H. Engel: THE EFFECT OF CRUDE OIL MIGRATION ON THE REDISTRIBUTION OF HYDROCARBONS: POSSIBLE IMPLICATIONS FOR PETROLEUM EXPLORATION [59625]..... Booth 34
- C. Winston Russell*, James B. Cowart: STRONTIUM ISOTOPE GEOCHEMISTRY OF OIL FIELD WATERS IN SOUTHEASTERN MISSISSIPPI: EVIDENCE FOR FLUID/ROCK INTERACTION AND APPLICATION AS A HYDROLOGIC TRACER [58608].... Booth 35
- K.W.F. Howard*, P.H. Jones, M.J. Thompson: CONTAMINANT TRANSPORT STUDIES OF A ^{14}C -LABELLED POLYMER USING AN AQUIFER SIMULATION TANK [76151]..... Booth 47
- Tim J. Bahr, Robert G. Corbett*: FORMATION OF SODIUM BICARBONATE GROUND WATER AND THE EFFECT ON FLUORIDE SOLUBILITY [74564]..... Booth 48
- Alan R. Dutton*, Charles W. Kreitler: RECHARGED OR MODIFIED-CONNATE WATER IN A CARBONATE BED WITHIN AN EVAPORITE AQUITARD, TEXAS PANHANDLE? [55029]..... Booth 49
- William H. Robinson*, Noel C. Krothe: COMPARISON OF TRADITIONAL AND OXYGEN-ISOTOPE METHODS OF STORM HYDROGRAPH SEPARATION IN TWO WATERSHEDS [56898]..... Booth 50
- M.J. Thompson*, K.W.F. Howard, P. Beck: IODIDE GEOCHEMISTRY OF SHALLOW GROUNDWATERS IN SOUTHERN ONTARIO [67301]..... Booth 51
- P.E. Pilon*, K.W.F. Howard, B.G. Kaye: THE INFLUENCE OF URBAN DEVELOPMENT ON THE QUALITY OF GROUNDWATER BENEATH METROPOLITAN TORONTO [67302]..... Booth 52
- James R. Erickson*, Devin L. Galloway, Kenzi Karasaki: INTERPRETATIONS OF FALLING-HEAD INJECTION TEST DATA FOR FRACTURED VOLCANIC TUFFS, YUCCA MOUNTAIN, NEVADA TEST SITE [73995]..... Booth 53
- Jingbing Wu*: THE CHARACTERISTICS OF GROUND WATER RADON ANOMALIES IN CHINA'S VARIOUS GEOLOGIC BODIES [74252]..... Booth 54
- Solomon Isiorho*, Gerald Matisoff, Peter L. McCall: GROUND WATER RECHARGE FROM LAKE CHAD [77025]..... Booth 55
- Robert M. Hordon*: USING SPECIFIC CAPACITY RATIOS TO ESTIMATE GROUNDWATER YIELD BY GEOLOGIC FORMATION [78796]..... Booth 56
- M.L. Ambrose*, W.R. Kaiser, G.E. Fogg: THE USE OF IONIC CONCENTRATIONS IN MAPPING GROUND-WATER FLOW: WILCOX-CARRIZO AQUIFER SYSTEM (PALEOGENE), EAST TEXAS [79313]..... Booth 57
- D. Anderson Smith*: GROUND-WATER HYDRAULICS OF THE DEEP-BASIN BRINE AQUIFER, PALO DURO BASIN, TEXAS PANHANDLE [56238]..... Booth 58
- John S. Clarke*, Rebekah Brooks, Robert E. Faye: HYDROGEOLOGY OF THE DUBLIN AND MID-VILLE AQUIFER SYSTEMS OF EAST-CENTRAL GEORGIA [72824]..... Booth 59
- Brad F. Gamble*, Yoram Eckstein: AN ANALYSIS OF SOIL WATER RESIDENCE TIMES IN A MONOLITH LYSIMETER AT THE NORTH APPALACHIAN EXPERIMENTAL WATERSHED [56038]..... Booth 60
- N. Gary Hemming*: CONTROLS ON THE WATER CHEMISTRY OF SOME SPRINGS IN A VOLCANIC TERRAIN, NAYARIT, MEXICO [78388]..... Booth 61
- Shirley J. Dreiss*, Catherine L. Summa: CHEMICAL FLUCTUATIONS IN KARST SPRINGFLOW STORM RESPONSES, SOUTHEASTERN MISSOURI [60586]..... Booth 62
- Steven J. Stokowski, Jr.*, Dennis A. Clark: LOCATING GROUNDWATER FLOW IN KARST BY ACOUSTIC EMISSION SURVEYS [70446]..... Booth 63
- P.A. Stone, R.L. Knox*, T.D. Mathews: AQUIFER RECHARGING IN SOUTH CAROLINA: RADIOCARBON IN ENVIRONMENTAL HYDROGEOLOGY [76647]..... Booth 64
- GEOCHEMISTRY I: CRUST/MANTLE GEOCHEMISTRY
South Hall C, Convention Center, 2:00 p.m.
- Peter Deines and Charles Langmuir, presiding
- 1 G. Lang Farmer*: A Sm-Nd ISOTOPIIC STUDY OF PRECAMBRIAN/CAMBRIAN SEDIMENTARY PROVENANCE IN THE GREAT BASIN AND IMPLICATIONS FOR THE TECTONIC EVOLUTION OF THE WESTERN U.S. [70871]..... 2:00 P
- 2 P. Vrolijk*, J.C. Moore, J. O'Neill: FLUID FLOW IN ACCRETIONARY PRISMS [60583]..... 2:15 P
- 3 Bruce K. Nelson*, D.J. DePaolo: ISOTOPIIC INVESTIGATION OF METASOMATISM IN SUBDUCTION ZONES: THE FRANCISCAN COMPLEX, CALIFORNIA [72636]..... 2:30 P
- 4 S.K. Saxena*, Y. Fei: HIGH PRESSURE PHASE EQUILIBRIUM IN THE SYSTEM Fe-Mg-Si-O [76185]..... 2:45 P

5 Peter Deines*: IDENTIFICATION OF 13C DEPLETED MANTLE CARBON IN DIAMONDS FROM THE ROBERTS VICTOR KIMBERLITE, SOUTH AFRICA [74692].....	3:00 P
6 J. Wen, K. Bell*, J. Blenkinsop: Sr AND Nd ISOTOPIIC RELATIONSHIPS IN THE OKA CARBONATITE COMPLEX, CANADA [72985].....	3:15 P
7 William K. Wertz*, Michael R. Perfit, Robert D. Shuster: STRONTIUM ISOTOPIIC EVIDENCE FOR AN ENRICHED SOURCE FOR POST-SUBDUCTION VOLCANIC ROCKS, DOMINICAN REPUBLIC [76674].....	3:30 P
8 J.L. Rubenstone*, C.H. Langmuir, W. Hildreth: ISOTOPE AND TRACE ELEMENT DATA BEARING ON THE SOURCES AND EVOLUTION OF MAGMAS IN THE KATMAI REGION, ALASKA [76613].....	3:45 P
9 K.L. Cameron*, P.C. Kelleher, D.E. Sampson, G. Lang Farmer: AN Nd AND Sr ISOTOPIIC STUDY OF THE INYO DOME-MONO CRATER RHYOLITES, EASTERN CALIFORNIA [78817].....	4:00 P
10 Stanley A. Mertzman*, Samuel M. Savin: O-, Sr-, Nd-ISOTOPE, AND TRACE ELEMENT RELATIONSHIPS IN LAVAS FROM MOUNT SHASTA IN NORTHERN CALIFORNIA [68951].....	4:15 P
11 D. Wesolowski*, J.R. Sans, C.P. Thornton, H. Ohmoto: REGIONAL TRENDS IN THE OXYGEN ISOTOPIIC COMPOSITIONS OF GRANITOID PLUTONS, CENTRAL AND SOUTHERN APPALACHIANS [75437].....	4:30 P
12 N. Srinivasan*, A.R. Basu, A.K. Sinha: PETRO-CHEMICAL AND ISOTOPIIC STUDIES OF TRANS-HIMALAYAN GRANITES IN LADAKH, NW INDIA [76321].....	4:45 P
13 R.P. Taylor*, W.D. Sinclair: GRANITES RELATED TO TIN MINERALIZATION AT MT. PLEASANT, NEW BRUNSWICK, CANADA: SUB-VOLCANIC ANALOGUES OF TOPAZ RHYOLITES [79338].....	5:00 P
14 E.Y. Anthony*, S.R. Titley: INVERSE SOLUTION FOR CRYSTAL FRACTIONATION IN A PERIODICALLY TAPPED MAGMA CHAMBER, SIERRITA PORPHYRY COPPER DEPOSIT, ARIZONA [65363].....	5:15 P
15 David A. Sawyer*, R.E. Zartman: LEAD ISOTOPIES IN CONTINENTAL ARC MAGMAS AND ORIGIN OF PORPHYRY Cu DEPOSITS IN ARIZONA [71174].....	5:30 P
16 G. Langmuir*, A. LeHuray, R. Fairbanks, L. Meinert: REE, TRACE ELEMENTS, Sr, Pb, C, AND O ISOTOPIES IN A ZONED SKARN ORE DEPOSIT [76608].....	5:45 P

Tuesday, Oct. 29

GEOCHEMICAL SOCIETY SYMPOSIUM: PROTEROZOIC MASSIF-TYPE ANORTHOSITES AND RELATED ROCKS: THEIR ORIGINS AND IMPLICATIONS FOR THE EVOLUTION OF THE EARTH'S CRUST AND MANTLE
South Hall A, Convention Center, 2:00 p.m.

E. Craig Simmons, presiding

1 E. Craig Simmons*, Gregory A. Snyder, Ruth I. Kalamarides, R.A. Wiebe: ORIGINS OF MASSIF-TYPE ANORTHOSITES AND RELATED ROCKS: ISOTOPIIC EVIDENCE FROM THE SOUTHERN NAIN ANORTHOSITE COMPLEX, LABRADOR [78344].....	2:00 P
2 L.D. Ashwal*, J.L. Wooden: ISOTOPIIC CONSTRAINTS ON ANORTHOSITE GENESIS AND IMPLICATIONS FOR CRUST-MANTLE EVOLUTION [73199].....	2:20 P

3 L.P. Gromet*, R.F. Dymek: PETROGENESIS OF MASSIF ANORTHOSITES: A PERSPECTIVE FROM ST. URBAIN, QUEBEC [75475].....	2:40 P
4 D.H. Lindsley*, A. Kolker, M. Fuhrman, B.R. Frost: A MODEL FOR THE POSSIBLE ORIGIN OF ANORTHOSITE-SYENITE ASSOCIATIONS LIKE THE LARAMIE ANORTHOSITE COMPLEX (LAC) [73203].....	3:00 P
5 M. Fuhrman, A. Kolker, D.H. Lindsley*, B.R. Frost: MONZONITES (MZ) AND MONZOSYENITES (MSY) ASSOCIATED WITH THE LARAMIE ANORTHOSITE COMPLEX (LAC), WYOMING [68385].....	3:10 P
6 S.A. Morse*: NAIN GEOCHEMISTRY REVIEWED: ANORTHOSITE PARENT LIQUIDS AND CONTAMINATION PROBLEMS [78345].....	3:20 P
7 J.H. Berg*: MAGMA EVOLUTION IN THE NAIN COMPLEX, LABRADOR, AND IMPLICATIONS FOR THE ORIGIN OF ANORTHOSITE [73190].....	3:40 P
8 S.R. Taylor*: A LOWER CRUSTAL SOURCE FOR MASSIF ANORTHOSITES [73195].....	4:00 P
9 R.A. Wiebe*: EVIDENCE FOR A LOWER CRUSTAL ORIGIN OF HIGH-Al ORTHOPYROXENE MEGACRYSTS IN PROTEROZOIC ANORTHOSITES [73193].....	4:20 P
10 Ronald F. Emslie*: PROTEROZOIC MASSIF ANORTHOSITES AND RELATED ROCKS IN LABRADOR: THE ANORTHOSITE-CHARNOCKITE CONNECTION [73200].....	4:40 P
11 Larry A. Haskin*, Peter A. Salpas, Karl E. Seifert: CHEMICAL TRENDS IN MASSIF ANORTHOSITES: COMPARISON WITH STILL-WATER TRENDS [77168].....	5:00 P
12 Daniel Demaiffe, Jean-Clair Duchesne, Jan Hertogen, Dominique Weis*: GENESIS OF MONZONORITIC ROCKS IN THE ROGALAND ANORTHOSITIC PROVINCE (S.W. NORWAY) [73198].....	5:20 P

Wednesday, Oct. 30

GEOCHEMISTRY II: WATER-ROCK GEOCHEMISTRY
6 Orchid, Convention Center, 8:00 a.m.

John Walther and Heinrich D. Holland, presiding

1 Randall T. Cygan*: SURET DIFFUSION PROCESSES IN AQUEOUS SODIUM CHLORIDE SOLUTIONS [74569].....	8:00 A
2 Glenn A. Wilson*, Hans P. Eugster: METAL-CHLORIDE SPECIATION FROM SUPER-CRITICAL SOLUBILITY EXPERIMENTS [69568].....	8:15 A
3 P. Ortoleva, C.H. Moore*, J. Chadam, E. Merino, J. Hettner: A NEW ALGORITHM FOR SIMULATING FLUID/ROCK INTERACTIONS [65213].....	8:30 A
4 William M. Murphy*, Harold C. Helgeson: MINERAL DISSOLUTION RATE CONTROL BY SURFACE RECONSTITUTION [65590].....	8:45 A
5 James J. Mazer*, John V. Walther: STEADY-STATE RATE CONSTANTS FOR DISSOLUTION OF BASALT AND SILICA GLASS AS A FUNCTION OF pH AT 65 DEGREES C [73902].....	9:00 A
6 Judith M. Ballantyne*, Joseph N. Moore, Michael C. Adams: ARSENIC GEOCHEMISTRY IN GEOTHERMAL SYSTEMS [77103].....	9:15 A
7 J.C. Varekamp*, P.R. Buseck: MERCURY FROM VOLCANIC AND GEOTHERMAL SOURCES [75763].....	9:30 A
8 John V. Walther*: EXPERIMENTALLY REVERSED PORTLANDITE AND BRUCITE SOLUBILITIES IN PURE H2O FROM 300 TO 600 DEGREES C AND 1 TO 3 KBAR [73903].....	9:45 A

- 9 S.E. Drummond*, D.A. Palmer: FORMATION CONSTANTS FOR AQUEOUS FERROUS ACETATE COMPLEXES FROM MAGNETITE SOLUBILITY MEASUREMENTS FROM 100 TO 250 DEGREES C AND 250 TO 1250 BARS [75453]..... 10:00 A
- 10 Patricia Martin Dove*, J.D. Rimstidt, William D. Newcomb: WOLLASTONITE HYDROLYSIS IN A MIXED FLOW REACTOR [57539]..... 10:15 A
- 11 Barbara P. Bishop*, Dennis K. Bird: CORRELATION OF HYDROTHERMAL SERICITE COMPOSITION WITH PERMEABILITY AND TEMPERATURE, COSO HOT SPRINGS GEOTHERMAL FIELD, INYO COUNTY, CA [60672]..... 10:30 A
- 12 E.C. Gitlin*: ALTERATION AND FLUID FLOW AROUND A SULFIDE-CARBONATE-QUARTZ VEIN, LUCKY FRIDAY MINE, NORTHERN IDAHO [77696]..... 10:45 A
- 13 Haraldur R. Karlsson*, Robert N. Clayton, Toshiko K. Mayeda: ANALCIME: A POTENTIAL GEOTHERMOMETER? [69694]..... 11:00 A

GEOCHEMICAL SOCIETY PRESIDENTIAL ADDRESS:
Hubert L. Barnes, "HYDROTHERMAL CALCULATIONS AND MISCALCULATIONS"..... 11:15 A

GEOCHEMICAL SOCIETY LUNCHEON AND AWARDS CEREMONY

Orange Room, Marriott Inn..... 12:00 noon

(Tickets \$13 on sale at ticket sales counter in registration area Convention Center from Sunday until Tuesday noon.)

Goldschmidt Medal and Strock Honorarium:
James B. Thompson, Jr., Harvard University

Clarke Medal: Edward M. Stolper, California Institute of Technology

Treibs Medal: Pierre Albrecht, Université Louis-Pasteur, Strasbourg

Best Paper, Organic Geochemistry Division:
T.C. Hoering: Thermal reactions of kerogen with added water, heavy water and pure organic substances

Thursday, Oct. 31

GEOCHEMISTRY III: LOW TEMPERATURE GEOCHEMISTRY
South Hall C, Convention Center, 8:00 a.m.

Donald L. Gautier and John E. Grover, presiding

- 1 John E. Grover*: A MODEL FOR GIBBS FREE ENERGY IN THE SYSTEM CALCITE-DOLomite-MAGNESITE: THE INTERDEPENDENCE OF COMPOSITION AND ORDER, AND A CONSTRAINT ON THE SOLUBILITY OF Mg-CALCITE IN AQUEOUS MEDIA [79348]..... 8:00 A
- 2 William D. Bischoff*, Catherine Agegian, Fred T. Mackenzie: MAGNESIAN CALCITE STABILITIES IN AQUEOUS SOLUTION: CONTRASTS IN RESULTS FROM DISSOLUTION OF BIOGENIC AND SYNTHETIC PHASES AND BIOGENIC PRECIPITATION [62353]..... 8:15 A
- 3 William G. Zempolich*: A MECHANISTIC APPROACH TO THE FORMATION OF SEDIMENTARY DOLOMITE [76141]..... 8:30 A

- 4 Luis A. Gonzalez*, K.C. Lohmann: CONTROLS ON CARBONATE MINERALOGY AND SOLID-SOLUTION OF Mg IN CALCITE: EVIDENCE FROM SPELEAN SYSTEMS [76126]..... 8:45 A
- 5 Elizabeth A. Burton*, Lynn M. Walter: RELATIVE GROWTH RATES AND COMPOSITIONS OF ARAGONITE AND Mg CALCITE CEMENTS IN SEAWATER: EFFECTS OF TEMPERATURE AND SULFATE [61818]..... 9:00 A
- 6 Miriam Kastner*: PHYSICO-CHEMICAL CONTROLS ON THE RATE OF DEDOLOMITIZATION OF PROTODOLOMITES AND DOLOMITE: AN EXPERIMENTAL STUDY [61447]..... 9:15 A
- 7 Paul M. Stout*, Miriam Kastner: EXTENT OF CALCITE RECRYSTALLIZATION IN DEEP-SEA SEDIMENTS: Sr/Ca DISTRIBUTIONS AND OXYGEN ISOTOPES [78867]..... 9:30 A
- 8 Ahad N. Chowdhury*, Lui Heung Chan: SIGNIFICANCE OF STRONTIUM ISOTOPIC RATIOS IN DOLOMITES: UPPER SMACKOVER FORMATION, EAST TEXAS [64851]..... 9:45 A
- 9 B.N. Popp*, K.H. Hackley, T.F. Anderson: DEVELOPMENT OF A $\delta^{34}\text{S}$ AGE CURVE FROM SULFATE IN BRACHIOPOD SHELLS [69574]..... 10:00 A
- 10 Donald L. Gautier*: SULFUR ISOTOPES IN CRETACEOUS SHALES OF NORTH AMERICA [79501]..... 10:15 A
- 11 Crayton J. Yapp*: OXYGEN ISOTOPE VARIATIONS IN GOETHITE ($\alpha\text{-FeOOH}$) [61058]..... 10:30 A
- 12 Deba P. Bhattacharyya*, Nathan R. Peck: OCEANIC HYDROTHERMAL ACTIVITY AND Fe-Mn SEDIMENTS: EFFECTS OF Fe-Mn FRACTIONATION [78303]..... 10:45 A
- 13 Donald E. Canfield*, Robert A. Berner: DIAGENESIS OF IRON IN MODERN MARINE SEDIMENTS [59489]..... 11:00 A
- 14 Birger Schmitz*: METAL-RICH PYRITE SPHEROIDS IN THE CRETACEOUS-TERTIARY BOUNDARY TYPE SEDIMENT [75538]..... 11:15 A
- 15 Alan J. Kaufman*, John M. Hayes, Cornelis Klein: COVARIANCE OF $\delta^{13}\text{C}$ AND $\delta^{18}\text{O}$ IN A BANDED IRON-FORMATION AND ITS GENETIC IMPLICATIONS [74605]..... 11:30 A
- 16 David R. Cole*: A PRELIMINARY EVALUATION OF OXYGEN ISOTOPIC EXCHANGE BETWEEN CHLORITE AND WATER [75447]..... 11:45 A

GEOCHEMISTRY IV: GENERAL GEOCHEMISTRY

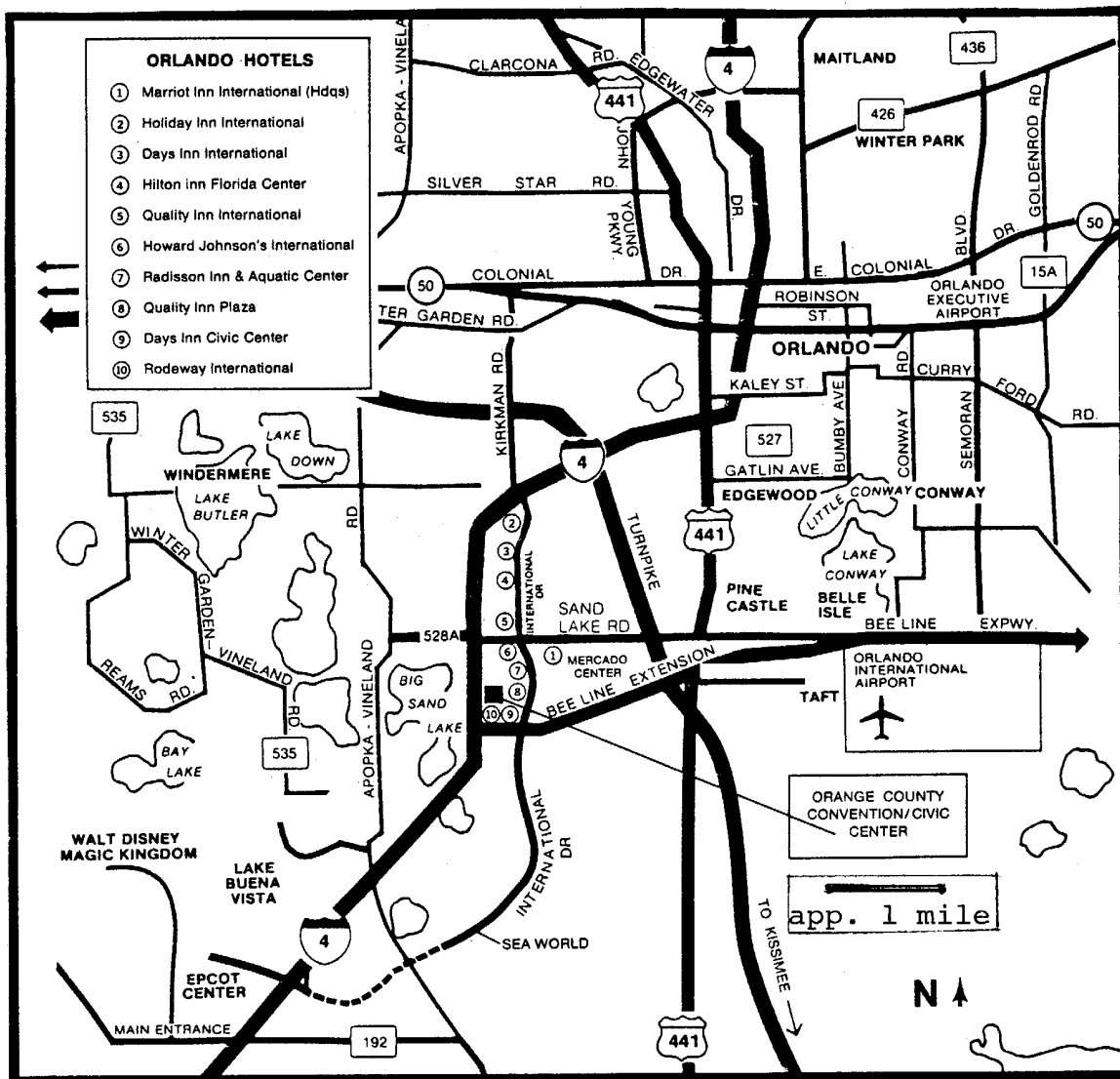
South Hall C, Convention Center, 1:00 p.m.

J. Veizer and William D. Bischoff, presiding

- 1 J. Veizer*, P. Fritz, B. Jones: GEOCHEMISTRY OF BRACHIOPODS: OXYGEN AND CARBON ISOTOPIC RECORDS OF PALEOZOIC OCEANS [68660]..... 1:00 P
- 2 L. Paul Knauth*, Sarah Kealy, Sarah Larimer: ISOTOPIC COMPOSITION OF SILURIAN SEAWATER [71227]..... 1:15 P
- 3 Boaz Lazar, Thomas J. Friedmann, Heinrich D. Holland*: THE COMPOSITION OF PERMIAN SEAWATER [59346]..... 1:30 P
- 4 Lisette Scott Keto*, Stein B. Jacobsen: THE CAUSES OF $^{87}\text{Sr}/^{86}\text{Sr}$ VARIATIONS IN SEAWATER OF THE PAST 750 MILLION YEARS [59341]..... 1:45 P
- 5 R. Lawrence Edwards*, James H. Chen, G.J. Wasserburg: PRECISE MEASUREMENTS OF $^{234}\text{U}/^{238}\text{U}$ AND ^{235}U CONCENTRATIONS IN PROFILES OF PACIFIC AND ATLANTIC WATERS [59886]..... 2:00 P

- 6 Lee R. Kump*, R.M. Garreis: DEVELOPMENT OF BOX MODELS FOR PREDICTION OF OXYGEN LEVELS IN PALEOATMOSPHERES [76720]..... 2:15 P
- 7 D.A. Weis*, H.H. Ngo, G.J. Wasserburg: 87Rb-86Sr AGE DETERMINATION ON CHERTS [59888]..... 2:30 P
- 8 I. Friedman*, G.A. Izett, J.D. Gleason: ISOTOPIC PALEOCLIMATE FROM HYDRATED VOLCANIC ASH [73480]..... 2:45 P
- 9 A.B. Cormie*, H.P. Schwarcz: STABLE HYDROGEN ISOTOPE ANALYSIS OF BONE COLLAGEN HAS POTENTIAL FOR PALEOCLIMATIC RESEARCH [67458]..... 3:00 P
- 10 Boaz Luz, H.P. Schwarcz*, A.B. Cormie: VARIATIONS OF OXYGEN AND HYDROGEN ISOTOPE RATIOS IN DEER BONES AND THEIR POTENTIAL IN PALEOCLIMATOLOGY [79118]..... 3:15 P
- 11 Robert Giegengack*, Jeffrey Klein, Roy Middleton, Pankaj Sharma, James R. Underwood, Jr., Robert A. Weeks: CUMULATIVE EXPOSURE AGES OF LIBYAN DESERT GLASS DETERMINED FROM IN SITU PRODUCTION OF 10Be AND 26Al [76193]..... 3:30 P

- 12 Ghislaine Crozaz*, Ernst Zinner: RARE EARTH ELEMENT (REE) CONCENTRATIONS AND ZONING IN INDIVIDUAL MINERAL GRAINS [77144]..... 3:45 P
- 13 Philip A. Chin*, Suchint Deetae, William C. Burnett: RELEASE OF URANIUM DECAY-SERIES NUCLIDES FROM FLORIDA PHOSPHATE ROCK [76656]..... 4:00 P
- 14 J.S. Hanor*, K.C. Duchac: GEOCHEMICAL CONSEQUENCES OF THE METASOMATIC CONVERSION OF AN EARLY ARCHEAN KOMATIITE SEQUENCE INTO CHERT [76973]..... 4:15 P
- 15 J. Donald Rimstidt*: GROUNDWATER IN GRANITIC ROCKS [63154]..... 4:30 P
- 16 Carol J. Bruton*: PREDICTING MINERAL DISSOLUTION AND PRECIPITATION DURING BURIAL: SYNTHETIC DIAGENETIC SEQUENCES [76040]..... 4:45 P



AIR TRANSPORTATION

The major carriers into Orlando are USAir, United, Delta, and Eastern. The new Orlando airport is one of the most convenient in the world.

GSA has designated the Cain Travel Group of Boulder, Colorado, as the official airline reservation agent for the Orlando meeting.

Cain Travel is a resource for those who want to work with a travel agent in determining the best possible airfares. Reduced rates at up to 50% off coach have been negotiated with several major carriers. These rates have restrictions such as 45-day and 30-day booking, so call early to take advantage of the savings. These rates will only be available to GSA participants through Cain Travel.

All GSA participants booking through Cain Travel will automatically become eligible for inclusion in a drawing for a **Free Vacation Package** for two: 4 days, 3 nights in either Cancun or Puerto Vallarta, including hotel (double occupancy), transfers, and airfare from Dallas. The first two hundred participants booking through Cain Travel will receive double eligibility for the drawing—your name will be placed in the drawing pool twice.

Round trip travel; Sunday and Thursday:

Boston	\$198
New York	\$198
Atlanta	\$154
Chicago	\$279
Denver	\$279
Dallas	\$254
Los Angeles	\$344
San Francisco	\$225

Reservation Procedures

1. Book early. Understand the restrictions on fare, if any.
2. Call Cain Travel at (800) 346-4747 (toll free) or (303) 443-2246, Monday - Friday, 7:00 a.m. to 5:30 p.m. MST.
3. Identify yourself as a GSA traveler.
4. The agent will quote you the discounted fare for your itinerary and confirm your reservation.
5. Payment options: Check payable to Cain Travel Group; major credit card; invoice to your firm.
6. All payment must reach Cain no later than seven days prior to departure. **No reservations can be accepted after this deadline, which allows adequate mailing time.**
7. Tickets will be sent to you via Certified Mail upon receipt of payment or credit card authorization.
8. We advise use of your home address for mailing, if this is more reliable than your business address. Tickets lost in the mail will be reissued only when new payment is made. In order to receive reimbursement, the passenger must file a lost-ticket application with the airline. This time-consuming process is the same for all airlines and agencies.
9. In the event of a decrease in your airfare after the ticket has been issued, call Cain Travel and they will re-ticket you at the lower fare.

The Cain Travel Group will provide a customer service desk at the Convention Center. Reservationists will be available to assist you with your travel needs and will be glad to help you make your visit to Orlando convenient and enjoyable.

GROUND TRANSPORTATION

A Welcome Hostess will be at the Main Information Desk at the Orlando airport. Information on transportation, hotels, restaurants, and entertainment will be available.

The 20-minute trip from the airport to the Convention Center area can be made by several types of ground transportation:

1. Airport Limousine

American Sight Seeing is offering a special rate to GSA registrants of \$3.50 one-way or \$7 round trip. This is bus transportation to and from the airport, offered at half the usual rate. Buses are dispatched from the American Sight Seeing desk in the baggage area. Say you're with GSA, and you'll be boarded at the discounted fare. You may book your return to the airport at the Convention Center.

2. Taxi

Please note: Taxis are unregulated in Orlando. Only taxis servicing the airport are required to be metered. Do not use an unmetered cab without establishing the rate first. Ask for Yellow, City, or Checker cabs, which are metered and offer an unconditional guarantee.

The current cab rates (as of June 1985) are \$1.80 for the first mile and \$1.20 for each mile thereafter which should be a maximum of \$18 per cab ride from the airport to any of the **GSA-designated** hotels and a maximum of \$4 from outer hotels to the Convention Center. To hold a cab, you will pay \$12 per hour. Note that rates are subject to change and are applicable for Yellow Cab, City Cab Company, and Checker Cab. Rates are a per-cab charge (not per person). Share a cab and save 50%. **IMPORTANT:** Be sure that the driver turns on the meter once you are settled in the car. Unless bags are unreasonably excessive, you should not be charged outside the metered rate. Drivers feel that a 12%-15% tip is an accepted average. If you experience problems with any of the above statements, call (305) 422-4455.

ORLANDO HOTELS

MARRIOTT INN INTERNATIONAL—HEADQUARTERS

8001 International Drive, Orlando, FL 32819,
305/351-2420 (800 rooms)

Single: \$65 Double: \$75 Double/Double: \$85
(Suite range: \$200-\$450)

Children under 18 sharing room with parent—FREE

Parking—FREE

4 tennis courts, outdoor Jacuzzi, 3 large outdoor swimming pools, 2 kiddie pools, poolside bars, children's playground, game room

Concierge Desk

Check-in: 4:00 p.m. Check-out: 11:00 a.m. CC: AX, D

DAY'S INN INTERNATIONAL

7200 International Drive, Orlando, FL 32801
305/351-1200 (75 rooms)

Single/Double: \$34

(No suites available)

Children under 18 sharing room with parent—FREE

Children under 12—FREE food (at hotel restaurant)

Parking—FREE

Outdoor swimming pool, children's playground

Check-in: 4:00 p.m. Check-out: 12:00 noon CC: AX, V, MC, D

HOLIDAY INN INTERNATIONAL

6515 International Drive, Orlando, FL 32819
305/351-3500 (300 rooms)

Single: \$47 Double: \$53
(Suite range: \$116-\$250)

Children under 18 sharing room with parent—FREE

Parking—FREE

Heated outdoor swimming pool, children's playground with kiddie pool, volleyball and shuffleboard

Free in-room movies

Concierge Desk

Check-in: 4:00 p.m. Check-out: 11:00 a.m. CC: AX, V, MC

DAY'S INN CIVIC CENTER

9990 International Drive, Orlando, FL 32809
305/352-8700 (100 rooms)

Single/Double: \$34

(No suites available)

Children under 18 sharing room with parent—FREE

Parking—FREE

Outdoor swimming pool, children's playground

Check-in: 4:00 p.m. Check-out: 12:00 noon CC: AX, V, MC, D

HILTON INN FLORIDA CENTER

7400 International Drive, Orlando, FL 32819
305/351-4800 (100 rooms)

Single/Double: \$50

(Suite range: \$125-\$350)

Children under 18 sharing room with parent—FREE

Parking—FREE

2 outdoor swimming pools, game room, children's playground

Check-in: 3:00 p.m. Check-out: 12:00 noon CC: AX, D, CB

HOWARD JOHNSON'S INTERNATIONAL

8020 International Drive, Orlando, FL 32819
305/351-1730 (100 rooms)

Single: \$45 Double: \$50

(No suites available)

Children under 18 sharing room with parent—FREE

Parking—FREE

Outdoor heated swimming pool, 2 lighted tennis courts, game room, children's playground

Check-in: 3:00 p.m. Check-out: 12:00 noon CC: AX, V, MC

QUALITY INN PLAZA

9000 International Drive, Orlando, FL 32819
305/345-8585 (250 rooms)

Single/Double: \$29

(No suites available)

Children under 17 sharing room with parent—FREE

Parking—FREE

2 outdoor swimming pools

Check-in: 3:00 p.m. Check-out: 11:00 a.m. CC: AX

RODEWAY INTERNATIONAL

9956 Hawaiian Court, Orlando, FL 32819
305/351-5100 (100 rooms)

Single: \$33 Double: \$46

(8 suites overlooking pool available at \$56)

Children under 18 sharing room with parent—FREE

Parking—FREE

Outdoor swimming pool, hot tub, children's playground

Continental breakfast, evening cocktails; no other food service

Restaurants nearby, Concierge Desk

Check-in: 4:00 p.m. Check-out: 12:00 noon CC: AX, V, MC, D, CB

QUALITY INN INTERNATIONAL

7600 International Drive, Orlando, FL 32819
305/351-1800 (300 rooms)

Single/Double: \$29

(No suites available)

Children under 18 sharing room with parent—FREE

Parking—FREE

2 outdoor swimming pools, game room

Check-in: 3:00 p.m. Check-out: 11:00 a.m. CC: AX

RADISSON INN & AQUATIC CENTER

8444 International Drive, Orlando, FL 32819
305/345-0505 (250 rooms)

Single: \$50 Double: \$55 (2 suites available at \$200)

Children under 18 sharing room with parent—FREE

Parking—FREE

Outdoor recreational pool, tennis court, 3/4 mile jogging trail, children's playground, and golf privileges (at cost). Also, a center for world-class aquatic training and competition which includes indoor Olympic pool and competitive diving well. Complete fitness center and health club (at \$7/day), and racquetball/handball courts (at \$8/hour)

Check-in: 3:00 p.m. Check-out: 12:00 noon CC: AX, V, MC

Credit card codes: AX = American Express / V = Visa

MC = MasterCard / D = Diners Club / CB = Carte Blanche



OFFICIAL HOUSING FORM

Please complete and return by **October 4** to:

HOUSING BUREAU FOR GSA
ORLANDO/ORANGE COUNTY CONVENTION & VISITORS BUREAU
7600 DR. PHILLIPS BLVD., SUITE 6
ORLANDO, FL 32818

Please print or type:

Hotel/Motel Preference (give complete name of property)

1. _____
2. _____
3. _____

Type of Accommodations

(send one reservation form per room)

- | | |
|--|---|
| <input type="checkbox"/> Single (1 bed, 1 person) | <input type="checkbox"/> 1 Bedroom Suite |
| <input type="checkbox"/> Double (1 bed, 2 persons) | <input type="checkbox"/> 2 Bedroom Suite |
| <input type="checkbox"/> Dbl/Dbi (2 beds, 2 persons) | <input type="checkbox"/> Add rollaway to room |
| <input type="checkbox"/> Triple (2 beds, 3 persons) | |
| <input type="checkbox"/> Quad (2 beds, 4 persons) | |

Rate Requested* _____

* Subject to 7% tax

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

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

NAMES OF OCCUPANTS

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

If sending deposit with this form: Remit in U.S. funds to "GSA Housing Bureau" or charge:	
<input type="checkbox"/> Master Card <input type="checkbox"/> Visa <input type="checkbox"/> American Express	
Card Expires: _____ / _____	_____ card # _____
mo. yr.	
Signature _____	

MAIL CONFIRMATION TO (type or print with dark ink):

Name _____ Phone (____) _____

University or Company _____

Address _____ street _____ city _____ state _____ zip _____

1. First night's deposit is required. Credit cards and checks will be accepted. Deposit due with housing form OR to hotel after receiving confirmation.
2. Notify hotel directly for any changes in arrival/departure or type of accommodations.
3. Cancellation 48 hours in advance of arrival is required for refund. Request cancellation number at that time.

PREREGISTRATION must be RECEIVED by September 27. Unpaid purchase orders NOT accepted as valid registration. Full payment MUST accompany all preregistration requests. One form per registrant. Participants in all events, short courses excluded, must pay a preregistration fee. CANCELLATION requests must be received in writing by October 4. NO refunds after this date.

Type or print ** Copy for your records

Name (Last) _____ (First) _____
 Institution/Employer _____ Nickname for badge _____
 Mailing Address _____
 City _____ State _____ Zip code _____
 Country _____ Business phone _____ Home phone _____
 Guest/Spouse Name (Last) _____ (First) _____
 City _____ State/Country _____
 Member Affiliations: (1)GSA _____ (2)CF _____ (3)GS _____ (4)GIS _____ (5)MSA _____
 (6)NAGT _____ (7)PS _____ (8)SEG _____ Member # _____

PREREGISTRATION FEES

	Column A	Qty	Amount
Professional Member (per affiliation above)		(1)	\$ 80
One-Day (circle day S M T W T)		(2)	\$ 50
Professional Nonmember		(3)	\$ 115
One-Day (circle day S M T W T)		(4)	\$ 65
Student Member (per affiliation above)		(5)	\$ 40
One-Day (circle day S M T W T)		(6)	\$ 25
Student Nonmember		(7)	\$ 55
One-Day (circle day S M T W T)		(8)	\$ 35
Guest (fill in name above)		(9)	\$ 30
Abstracts with Programs (on-site pickup)		(10)	\$ 18

GUEST PROGRAM

Foliage Tour	Oct 28 (11)	\$ 25
Kennedy Space Center Luncheon	Oct 29 (12)	\$ 30
Winter Park Whirl-Around	Oct 30 (13)	\$ 30

SPECIAL EVENTS

Invitational Tennis	Oct 27 (14)	\$ 6
Walt Disney World (Two-Day Pass)	All days (15)	\$ 32
Mardi Gras (6 p.m.)	Oct 29 (16)	\$ 17
Mardi Gras (9 p.m.)	Oct 29 (17)	\$ 17
Sea World	Oct 30 (18)	\$ 24
Orlando 10K Run	Oct 30 (19)	\$ 7
Orlando 5K Run	Oct 30 (20)	\$ 7
Circle T-Shirt Size: S M L	Total of Column A	\$

	Fee	Qty	Amount
Organic Geochemistry Dinner	\$ 22	Oct 27 (21)	\$
GSA Awards	\$ 13	Oct 28 (22)	\$
Engineering Geology	\$ 13	Oct 29 (23)	\$
GIS	\$ 13	Oct 29 (24)	\$
History of Geology	\$ 13	Oct 29 (25)	\$
Hydrogeology	\$ 13	Oct 29 (26)	\$
MSA	\$ 13	Oct 29 (27)	\$
NAGT	\$ 13	Oct 29 (28)	\$
Paleo Society	\$ 13	Oct 29 (29)	\$
Women Geoscientists Breakfast	\$ 10	Oct 29 (30)	\$
Coal Geology	\$ 13	Oct 30 (31)	\$
Geochemical Society	\$ 13	Oct 30 (32)	\$
Quaternary & Geomorphology	\$ 13	Oct 30 (33)	\$
SEG	\$ 13	Oct 30 (34)	\$

FIELD TRIPS

1 Barrier Island/Marsh	Oct 24-27 (35)	\$250
2 San Salvador Island	Oct 24-27 (36)	\$425
3 Hydrogeol Central/N FI	Oct 26-27 (37)	\$ 65
4 Coastal Geol/Beachrock	Oct 25-27 (38)	\$200
5 Geol S Georgia	Oct 24-27 (39)	\$200
7a Carbon Coal-bearing Rocks	Oct 24-27 (40)	\$360
7b #7 without airfare	Oct 24-27 (41)	\$196
8a Winter Park Sinkhole	Oct 29 (42)	\$ 7
8b Winter Park Sinkhole (repeat)	Oct 30 (43)	\$ 7
9 Land Pebble Phosphates	Nov 1-2 (44)	\$100
11a Haiti	Oct 31-Nov 5 (45)	\$600
11b #11 without airfare	Oct 31-Nov 5 (46)	\$322
12 Apalachicola River	Nov 1 (47)	\$ 25
13 Coastal Morphology	Oct 31-Nov 2 (48)	\$195

SHORT COURSES

Geowriting	Oct 26 (49)	\$ 75
Planetary Geology	Oct 26-27 (50)	\$100
Geowriting (repeat)	Oct 27 (51)	\$ 75
Remote Sensing	Oct 27 (52)	\$100
UNIX	Oct 27 (53)	\$100
Balancing Cross Sections	Nov 1-2 (54)	\$160
	Total Column B	\$
	Total Column A	\$
	Column A + B = Total Remittance	\$

REMIT IN U.S. FUNDS, PAYABLE TO 1985 GSA ANNUAL MEETING

OR CHARGE: MASTERCARD VISA American Express

Card expires: ____/____/____ yr _____ card number _____

Signature _____

FOR OFFICE USE ONLY

Deposit Date	Refund Date
Balance Due \$	A/R Comment
Refund \$	A/P
Refund Ck #	

MAIL TO:

1985 GSA ANNUAL MEETING, P.O. BOX 9140, BOULDER, CO 80301.

