

## VITA

### J. Richard Kyle

Third C. E. Yager Professor of Geology  
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#### PERSONAL DATA:

Born March 23, 1947 - Athens, Tennessee

#### EDUCATION:

Ph.D., Geology, 1977, University of Western Ontario, London, Canada  
Dissertation: "Development of sulfide-hosting structures and mineralization, Pine Point, Northwest Territories" (R. W. Hutchinson, supervisor).  
M.S., Geology, 1973, University of Tennessee, Knoxville, Tennessee  
Thesis: "Preliminary investigation of brecciation, alteration, and mineralization in the upper Knox Group of Smith and Trousdale Counties, Tennessee" (L. T. Larson, supervisor).  
B.S., Geology, 1970, Tennessee Technological University, Cookeville, Tennessee

#### SIGNIFICANT PROFESSIONAL EXPERIENCE:

2003 to date Registered Professional Geoscientist, Texas License #4148  
1990 to date Professor; Department of Geological Sciences, The University of Texas at Austin  
1980 to date Consulting Geologist, various clients  
1984 to 1990 Associate Professor; Department of Geological Sciences, The University of Texas at Austin, Austin, TX  
Spring, 1983 Research Associate, Bureau of Economic Geology; The University of Texas at Austin  
1978 to 1984 Assistant Professor; Department of Geological Sciences, The University of Texas at Austin, Austin, TX  
1976 to 1978 Exploration Geologist; Exxon Minerals Company, U.S.A; Rhinelander, WI

#### PROFESSIONAL AWARDS:

Society of Economic Geologists Thayer Lindsley Lecturer (2002)  
Gulf Coast Association of Geological Societies Excellence of Presentation Award (2001)  
Mineral Deposits Studies Group, Geological Society of London, Keynote Presentation (1988)  
Society of Economic Paleontologists and Mineralogists Excellence of Presentation Award (1986)  
Society of Economic Paleontologists and Mineralogists Gulf Coast Section Best Paper Award (1984)  
Society of Mining Engineers Robert Peele Memorial (Best Paper) Award (1981)

#### UNIVERSITY AWARDS:

Third C. E. Yager Professor in Geological Sciences (1998 to date)

Shell Oil Company Teaching Fellow in Geological Sciences (1995 to 1998)  
Getty Oil Company Centennial Teaching Fellow in Geological Sciences (1989 to 1995)  
Geology Foundation Advisory Council Centennial Teaching Fellow (1985 to 1989)  
Houston Oil and Minerals Faculty Excellence Award (1992)  
Natural Sciences Council Teaching Excellence Award (1981)  
Houston Oil and Minerals Faculty Excellence Award (1980)

**RESEARCH INTERESTS:**

Ore deposits geology, mineralization in volcanic terranes, tectonic controls of mineralization, minerals exploration, industrial mineral resources, origin of ore-forming fluids in sedimentary environments, fluid inclusions, stable isotopes, halokinesis and cap rock formation, carbonate diagenesis, multimedia development for geoscience education, high resolution X-ray computed tomography applications to ore deposit studies.

**PROFESSIONAL SOCIETIES:**

American Association of Petroleum Geologists  
 Austin Geological Society  
 Geological Association of Canada (Fellow)  
 Geological Society of America (Fellow)  
 International Association on the Genesis of Ore Deposits  
 National Association of Geology Teachers  
 Society of Economic Geologists (Fellow)  
 Society for Geology Applied to Mineral Deposits  
 Society for Mining, Metallurgy, and Exploration (SME)  
 Society for Mining, Metallurgy, and Exploration (Central Texas Section)  
 Society for Sedimentary Geology (SEPM)

**PROFESSIONAL SERVICES:**

Society of Economic Geologists Distinguished Lecturer Committee 2004.to date  
 Chair, Central Texas Section, Society for Mining, Metallurgy, and Exploration, 2000 to 2002.  
 Secretary, Central Texas Section, Society for Mining, Metallurgy, and Exploration, 1999 to 2002.  
 Editor-in-Chief of *Ore Geology Reviews* (Elsevier) 1990 to 2003.  
 Scientific Correspondent, *Chronique de la Recherche Minière*, BRGM, Orleans, 1994 to date.  
 Petrology and Geochemistry Panel, National Science Foundation, 1998  
 Chairman, Committee on Committees, Society of Economic Geologists, 1997-1998.  
 Research Committee, Society of Economic Geologists, 1992 to 1995.  
 Board of Advisors, Dept. of Geological Sciences, University of Tennessee, Knoxville, 1993 to 1996.  
 Associate Editor, *Economic Geology*, 1990 to 1992.  
 Leader of field trips to examine salt dome cap rock geology and mineral resources for the Society of Economic Geologists (1995), the American Association of Petroleum Geologists (1993), and the New Orleans Geological Society (1992).  
 Leader of a Society of Economic Geologists field trip to examine industrial mineral resources of the Delaware Basin for the 1990 Geological Society of America Annual Meeting, Dallas, Texas.  
 Convenor of a Society of Economic Paleontologists and Mineralogists Special Session on "Fluid-rock Interactions in the Salt Dome Environment", 1987 Midyear Meeting, Austin, Texas.  
 Program Policy Committee, Society of Economic Geologists, 1983 to 1986.  
 Society of Economic Geologists Program Chairman for 1986 meeting with the Geological Society of America Annual Meeting, San Antonio, Texas.  
 Convenor of Society of Economic Geologists Special Session on "Precious Metals in Carbonate Replacement and Skarn Environments", Geological Society of America Annual Meeting, San Antonio, Texas.  
 Reviewer of manuscripts for *American Association of Petroleum Geologists Bulletin*, *Economic Geology*, *Geological Society of America Bulletin*, *International Geology Reviews*, *Journal of Geophysical Research*, *Mineralium Deposita*, *Mining Engineering*, and *Tectonics*, for Special Publications of the Geological Association of Canada, the Society for Mining, Metallurgy, and

Exploration, the Society for Sedimentary Geology, the International Association on the Genesis of Ore Deposits, and the University of Texas Bureau of Economic Geology.

Reviewer of research proposals for the Petrogenesis and Mineral Resources, Petrology and Geochemistry, Surficial Processes, and Special Projects divisions of the National Science Foundation, for the Petroleum Research Fund of the American Chemical Society, and for the United States Geological Survey.

Reviewer of books for *Economic Geology*, *Journal of Geological Education*, *Journal of Sedimentary Petrology*, and *Ore Geology Reviews*.

**ADMINISTRATIVE SERVICE TO THE UNIVERSITY AND DEPARTMENT:**

1996 to 1998	College of Natural Sciences Committee on Admissions	
1995 – 1996	CNS Director of Corporate Relations and Placement Search Committee	
1992 – 1993	College of Natural Sciences Staff Excellence Awards Committee	
1990 to 1995	College of Natural Sciences Undergraduate Education Committee	
1982 – 1983	College of Natural Sciences Course and Curriculum Committee	
2003 to date	Department of Geological Sciences Post-tenure Review Committee	
2003 to date	Department of Geological Sciences Research Scientist Review Committee	
2003 to date	Assistant Graduate Advisor, Department of Geological Sciences	
2000 to 2003	Graduate Advisor, Department of Geological Sciences	2000 to 2
2000 to 2003	Chair, Department of Geological Sciences Graduate Studies Committee	
1998 to date	Member, Energy & Mineral Resources Graduate Studies Committee (Department of Petroleum and Geosystems Engineering)	
1998 to 2003	Chair, Department of Geol. Sciences Graduate Admissions & Support Committee	
1992 to 1999	Department of Geological Sciences Gem & Mineral Collections Committee	
1995 to 1998	Department of Geological Sciences Graduate Admissions and Support Committee	
1990 to date	Department of Geological Sciences Budget Committee	
1992 to 1996	Department of Geological Sciences Library Resources Committee	
1985 to 1995	Department of Geological Sciences Undergraduate Advisor	
1986 to 1995	Chairman, DGS Undergraduate Advising and Awards Committee	
1985 to 1992	Chairman, DGS Cartography Committee	
1988 to 1991	Geology Foundation Faculty Review Committee	
1986 – 1987	DGS Research Scientist Review Committee	
1980 to 1982	DGS Executive Committee	

**COURSES TAUGHT:**

- (1) GEO 401 Physical Geology
- (2) GEO 335 Geology and Mineral Resources of Texas (Upper Division Elective)
- (3) GEO 341 Mineral Resources (Upper Division Elective; Substantial Writing Course)
- (4) GEO 330K Petroleum Geology: Basin and Trend Analysis (Upper Division Elective)
- (5) GEO 358K Volcanology (Upper Division Elective; Substantial Writing Course)
- (5) GEO 362K Geology of Metallic Ore Deposits (Upper Division Geology Elective)
- (6) GEO 362L Geology of Nonmetallic Ore Deposits (Upper Division Geology Elective)
- (7) GEO 368N Applied Geology of Energy Resources (Upper Division Service Course)
- (8) GEO 660 Field Geology (Geology Major Requirement)
- (9) GEO 391 Ore Deposits in Carbonate Rocks (Graduate)
- (10) GEO 386E Economic Geology (Core course for graduate energy and mineral resources program in the Department of Petroleum and Geosystems Engineering)
- (11) GEO 391 Geological and Financial Analysis of Precious Metals Deposits (Graduate)
- (12) GEO 391 Principles of Minerals Exploration (Graduate)
- (13) GEO 391 Seminar in Fluid Inclusions: Theory and Practice (Graduate)
- (14) GEO 381R Regional Studies in Mineral Resources Geology (Graduate)
- (15) GEO 391G Ore Deposits in Volcanic Environments (Graduate)
- (16) GEO 391H Ore Deposits in Sedimentary Environments (Graduate)
- (17) GEO 298T Supervised Teaching for Graduate Students

**SPECIAL STUDENT SERVICES**

In addition to having served as the departmental Undergraduate Advisor from 1985 to 1995 and Graduate Advisor from 2000 to 2003, I have served particularly as an informal advisor for students at all levels for career opportunities in the mineral resource industries. I also serve in the Faculty Contacts Program coordinated by the University Career Center. Further, I have enhanced my classroom teaching by organizing and leading more than 30 local, regional, and international field trips for students to examine mineral resources within their regional geologic setting and/or to attend major research symposia, thus providing opportunity for interaction with current applied and research activities.

- 2005 Regional studies of the geology and mineral resources of the Great Basin and the Window on the World Geological Society of Nevada meeting, Reno, NV  
Cenozoic Volcanism and Mineralization, Trans-Pecos Texas
- 2003 Regional studies of the geology and mineral resources of Western Australia
- 2003 Diverse carbonate-hosted Zn-Pb-Ag deposits, Trans-Pecos Texas and Chihuahua, Mexico  
Cretaceous volcanism of central Texas
- 2001 Regional studies of the geology and mineral resources of the Iberian Peninsula
- 2000 Regional studies of the geology and mineral resources of Peru  
Tectonics, magmatism, sedimentation, and mineralization in West Texas and New Mexico
- Mexico
- 1999 Geology and mining of central Texas lignite deposits  
Regional studies of the geology and mineral resources of the central Andes, northern Chile
- Chile
- 1997 Regional studies of mineral resource geology of the West Texas and New Mexico
- 1996 Regional studies of mineral resource geology of the Southwestern United States
- 1993 Tectonic, magmatic, sedimentation, and mineralization history of the southern Midcontinent
- 1992 Mineralization, magmatism, and tectonism in the Southwestern United States
- 1990 Geologic setting of intrusion- and skarn-hosted copper deposits of Arizona & New Mexico
- Mexico
- 1989 Regional geology and ore deposits in Oklahoma, Missouri, Kentucky, and Tennessee
- 1988 Geology and extraction of south Texas uranium deposits
- 1987 Regional geology and ore deposits in Missouri, Arkansas, and Oklahoma  
Regional geology and ore deposits in Trans-Pecos Texas and New Mexico and the inaugural meeting of American Current Research on Fluid Inclusions, Socorro, NM
- 1985 Regional geology and mineral resources associated with salt domes in the Gulf Coast
- 1984 Regional geology and ore deposits in Durango, Zacatecas, San Luis Potosi, and Coahuila
- 1983 Regional geology and mineral deposits in the Delaware Basin in Texas and New Mexico
- 1982 International Conference on Mississippi Valley-type Lead-Zinc Deposits, Rolla, Missouri  
Regional geology and ore deposits in Guanajuato, Durango, Zacatecas, San Luis Potosi, and Coahuila, Mexico
- 1981 Regional geology and ore deposits in Missouri, Arkansas, and Oklahoma  
Regional geology and ore deposits in Trans-Pecos Texas and New Mexico, and the symposium on Relations of Tectonics to Ore Deposition in the Southern Cordillera, Tucson, AZ
- 1980 Regional tectonics and ore deposits in Alabama, North Carolina, Tennessee, & Arkansas  
Regional geology and ore deposits in Trans-Pecos Texas, New Mexico, and Arizona
- 1979 Regional geology and ore deposits in Arkansas and Missouri  
American Institute of Mining, Metallurgical, and Petroleum Engineers Annual Meeting, New Orleans, LA

**GRADUATE STUDENT SUPERVISION:****Ph. D. Dissertations Supervised** (four completed, 1 in progress):

- Lyons, James, Mesozoic tectonic evolution and mineral deposit distribution of Mexico. Graduation expected May 2008.
- Li, Ning, 1998, "Depositional controls and genesis of the Jinding sandstone-hosted Zn-Pb deposit, Yunnan province, southwest China". Present Position: Geoscientist, Paradigm Geophysical, Houston, TX
- Edgerton, David G., 1997, "Geologic models of sediment-buffered hydrothermal vents: a case study of the Red Dog Zn-Pb-Ag orebody, western Brooks Range, Alaska"  
Present Position: Exploration Manager, Xminco Exploration and Mining Co., Accra, Ghana
- Rubin, Jeffrey N., 1996, "Skarn formation and ore deposition at the Gunung Bijih Timur (Ertsberg East) Complex, Irian Jaya, Indonesia".  
Present Position: Emergency Management Program Manager, Tualatin Valley Fire & Rescue, East Division, Oregon City, OR
- Farr, Mark R., 1988, "Compositional variation of late dolomite cement as a guide to parent fluid flow directions in the Cambrian Bonnetterre Formation, southeast Missouri" (co-supervised with L. Land).  
Present Position: Research Associate, Geology Department, University of Kansas, Lawrence, KS

**M. S. Theses Supervised** (29 completed 1980 to date; four in progress):

- Michaelides, Michael, Geochemistry and alteration of the White Bentonite deposits, Gonzales Co., Texas. Graduation expected December 2006.
- Beane, Lorraine, Deep Grasberg Cu-Au porphyry deposit, Ertsberg District, Papua, Indonesia. Graduation expected December 2006.
- Duncan, Laurel, Calc-silicate alteration and Au-Cu mineralization in the Deep MLZ skarn deposit of the Ertsberg District, Papua, Indonesia. Graduation expected December 2006.
- Rivera, Luis, "Relation of the El Dorado epithermal gold mineralization to late Tertiary tectonic and volcanic evolution of El Salvador". Graduation expected December, 2005.
- Rambaud, Fabienne, 2005, "Nature and source of the mineralizing fluids at the Presidio mine, Shafter district, Presidio County, Texas".
- Mote, Alison, 2004, "A kinematic investigation in the Cripple Creek District, central Colorado: Implications regarding structural controls influencing the location and distribution of gold ore zones".  
Present Position: Research Scientist Assistant, Computed Tomography Lab, Jackson School of Geosciences, University of Texas at Austin, Austin, TX
- McGuire, James, 2003, "Geology and carbonate-replacement Zn-Pb-Ag mineralization in the Hecla area, southwestern Montana".  
Present Position: Emory Law School, Atlanta, GA
- Head, Jennifer, 2002, "Stratigraphic and structural controls of Permian carbonate-hosted silver (Pb-Zn) mineralization, Shafter Presidio County, Texas".  
Present Position: Geologist, Predictive Stratigraphy, Conoco Inc., Houston, TX
- Muzaffar, Asif, 2001, "Relations among sedimentation, diapirism, and cap rock formation at the Davis Hill salt dome, Liberty Co., Texas".  
Present Position: Geoscientist, BP Pakistan Exploration and Production Inc., Islamabad, Pakistan
- Gilmer, Amy K., 2001, "Age and characterization of the Red Hills porphyry copper-molybdenum deposit and its relationship to the Chinati Mountains caldera, Presidio County, Texas".  
Present Position: Virginia Department of Mines and Geology, Charlottesville, VA
- Harrison, Jeffrey, 1999, "Hydrothermal alteration and fluid evolution of the Grasberg porphyry Cu-Au deposit, Irian Jaya, Indonesia".

- Present Position: Geologist, Alaska, Phillips Petroleum, Anchorage, AK
- Smith, Virginia, 1998, "Geology and geochemistry of hydrothermal alteration at the Tyrone porphyry copper deposit, New Mexico".
- Present Position: Geoscientist, Offshore Division, Texaco, New Orleans, LA
- Smith, Jennifer S., 1996, "Origins of calcite and pyrite cements in the Carrizo Sandstone on the flank of Butler dome, East Texas Basin: Petrographic and isotopic evidence for fluid circulation near salt domes".
- Present Position: Geologist, Alaska Asset Team, Marathon Oil Co., Houston, TX
- Mertig, Heidi J., 1995, "Origin of the Dom copper skarn deposit, Ertzberg district, Irian Jaya, Indonesia". Present Position: Engineering Geologist, Barrick Corp., Elko, NV
- Agee, William N., Jr., 1990, "Relation of metal sulfide mineralization to anhydrite cap rock formation, Hockley salt dome, Harris County, Texas".
- Present Position: Project Hydrogeologist; Fluor Daniel Corp.; Dallas, TX
- Coel, Becky J., 1990, "Biogeochemical cycling of gold in a placer deposit, Livengood, Alaska".
- Present Position: Los Alamos National Laboratory, Los Alamos, NM
- Prikryl, James P., 1989, "Origin of salt dome limestone cap rocks in the U.S. Gulf Coast".
- Present Position: Research Scientist, Southwest Research Institute, San Antonio, TX
- Chieruzzi, Gianni O., 1988, "Geochemical flow modeling of supergene alteration of porphyry copper deposits". (Co-supervised with L. Lake, Department of Petroleum Engineering).
- Present Position: Chester Engineers, Pittsburgh, PA
- Standen, Allan R., 1987, "Mineralization of the Scotia-Vanderbilt vein system, Silverton, Colorado".
- Present Position: Geologist, LBG-Guyton; Austin, TX
- Gutierrez, Gay N., 1987, "Controls on ore deposition in the Lamotte Sandstone, Goose Creek mine, Indian Creek subdistrict, southeast Missouri".
- Present Position: Project Hydrogeologist; OHM Corporation; Austin, TX
- Vasconcelos, Paulo, 1987, "Gold geochemistry in a semiarid weathering environment: a case study of the Fazenda Brasileiro deposit, Bahia, Brazil".
- Present Position: Lecturer, University of Queensland, Brisbane, Queensland, Australia.
- Rubin, Jeffrey N., 1986, "Mineralogy and ore genesis at the San Martin mine, Zacatecas, Mexico".
- Present Position: Emergency Management Program Manager, Tualatin Valley Fire & Rescue, East Division, Oregon City, OR
- Bobeck, Patricia A., 1985, "Igneous petrology and structural geology of Nine-Point Mesa, Brewster County, Texas". (co-supervised with D. Barker)
- Present Position: Geologist; Texas Natural Resources and Conservation Commission; Austin, TX
- Hardwick, James F., Jr., 1984, "Epithermal vein and carbonate replacement mineralization related to caldera development, Cunningham Gulch, Silverton, Colorado".
- Present Position: Consulting Geologist; Lafayette, LA
- Barrie, Tucker, 1984, "Geology of the Khayyam and Stumble-on Deposits, Prince of Wales Island, Alaska"
- Present Position: Research Scientist; Geological Survey of Canada; Ottawa, Ontario
- Johns, David A., 1983, "Geologic controls of massive sulfide mineralization in late Mesozoic metamorphic rocks, Tizapa, Estado de Mexico, Mexico".
- Present Position: Geologist, City of Austin Department of Environmental Protection, Austin, TX
- Logan, William S., 1983, "Geology of the Agalteca magnetite skarn deposit, central Honduras".
- Present Position: Senior Staff Officer, Water Science and Technology Board, National Research Council, Washington, DC 20001
- Herwig, Jonathan C., 1982, "Stratigraphy, structure, and massive sulfide potential of late Mesozoic metamorphic rocks near El Cirian, Estado de Mexico, Mexico".
- Present Position: Technical Director; Ogden Consultants; Honolulu, HI

Craig, Lisa E., 1982, "Silicification and porosity development in upper Knox Group carbonate rocks, Burkesville, Kentucky".

Present Position: Geologist; Environmental consulting group; New Orleans, LA

Allie, Adrienne D., 1981, "Stratigraphic controls of carbonate-hosted sulfide mineralization, Iron Rock Creek area, Blanco and Gillespie Counties, Texas".

Present Position: Senior Geologist; Shell Offshore, Inc.; New Orleans, LA

Immitt, James P., 1981, "Skarn and epithermal vein mineralization in the San Carlos caldera region, northeastern Chihuahua, Mexico".

Present Position: Financial Analyst, Motorola, Austin, TX

Masterson, W. Dallam, 1981, "Hydrothermal alteration and mineralization, Velvet district, Nevada".

Present Position: Manager, North Slope Satellite Exploration, Phillips Alaska, Anchorage, AK

Fredericks, Paul E., 1980, "Volcanic lithofacies and massive sulfide mineralization, East Shasta, California"

Present Position: Principal; MineraLogic; Missoula, MT

Dr. Kyle has served on supervisory committees of seven Ph.D. candidates and 14 Master's candidates in the Department of Geological Sciences. He has served on supervisory committees of one Ph.D. and three Master's candidates in the Department of Petroleum Engineering and one Master's candidate in the Chemistry Department.

Dr. Kyle has served as External Examiner for Ph.D. dissertations at the University of North Carolina at Chapel Hill (Harry Posey, 1986), at Dalhousie University (Casey Ravenhurst, 1987; Nick Wilson, 1998), the University of Queensland (Stephen Andrews, 1998), and the University of Western Australia (Richard Kempton, 1999).

#### **POST-DOCTORAL AND VISITING SCIENTISTS:**

Huan-Zhang Lu, Professor, Université du Québec à Chicoutimi, Chicoutimi, Québec, Canada, 1998 Stay in Austin, Research on porphyry ore formation and on bacteriogenic calcite formation; funding from the Université du Québec à Chicoutimi (sabbatical).

Eric James, Research Scientist, University of Texas at Austin, 1995-97, Research on isotopic character of Ertsberg district Cu-Au deposits, Irian Jaya, Indonesia; Funding from Freeport-McMoRan.

Youn-Ho Jang, Associate Professor, Samchock Technical College, Kangwon-do, Korea, 1989-90 Stay in Austin, Research on Samhwa skarn iron deposits, Korea (co-sponsored with D. Barker); funding from Korean federal science agency.

Aroldo Misi, Professor, Federal University of Bahia, Salvador, Bahia, Brazil, 1988-90 Stay in Austin, Research on phosphate and metal sulfide deposits in Late Proterozoic carbonate strata, Irece, Bahia; funding from CNPQ (Brazilian federal science agency).

Harry H. Posey, 1987-88 Stay in Austin, Research on salt dome cap rock geochemistry; funding from National Science Foundation grant EAR-8709319.

#### **MAJOR RESEARCH SUPPORT:**

2005-06 National Science Foundation Equipment Grant (\$107,400): "Acquisition of a Fourier Transform Infrared (FTIR) Spectroscopy System: Measuring Volatiles in Magmatic and Ore-Forming Systems" (Co-PI J. Gardner and J. Lassiter).

2004-05 PT Freeport Indonesia Research Grant (\$40,000): "Use of High Resolution X-ray Computed Tomography in Ore Mineralogy".

- 1997-00 American Chemical Society Petroleum Research Fund Grant PRF#32557-AC8 (\$50,000): "Bacterial Processes in Sedimentary Environments: Origin of "Bacteriogenic" Calcite-Sulfur Concentrations in the Delaware Basin, West Texas".
- 1994-00 Freeport Indonesia Ertsberg (Gunung Bijih) District Research Grant (\$355,000): "Tectonics and Mineral Deposits of Irian Jaya, Indonesia: Phase II Ore Studies".
- 1995-98 National Science Foundation Research Grant EAR-9405546 (\$110,000): "Genesis of Metallic Mineralization in Continental Rift Basins: A Study of Sandstone-hosted Pb-Zn-Sr Deposits in a Tertiary Rift Basin, Yunnan, China".
- 1989-93 Freeport Indonesia Ertsberg (Gunung Bijih) District Research Grant (\$662,000): "Tectonics and Mineral Deposits of Irian Jaya, Indonesia" (M. Cloos Co-PI).
- 1987-89 National Science Foundation Research Grant EAR-8709319 (\$105,730): "Petrologic, Geochemical, and Isotopic Investigation of Gulf Coast Salt Dome Cap Rocks".
- 1987-89 American Chemical Society Petroleum Research Fund Grant PRF#19624-AC2 (\$32,595): "Paleomagnetic Investigation of Salt Dome Growth Rates" (W. Gose Co-PI).
- 1985-87 National Science Foundation Research Grant EAR-8407736 (\$117,000): "Nature and Origin of Sulfide Deposits in Gulf Coast Salt Dome Cap Rocks".

More than 20 other companies have provided support for student research projects totaling over \$300,000, exclusive of invaluable proprietary data. In addition, cooperative research agreements have been established with federal agencies in the United States (U. S. Geological Survey), Canada (Geological Survey of Canada), China (Institute for Geosciences), Mexico (Consejo de Recursos Minerals), Honduras (Instituto Geografico Nacional), and Brazil (CNPQ). These agencies provided logistical, per diem, and analytical support for research projects in their countries. The University Research Institute has contributed more than \$50,000 in support of minor research activities, typically as seed money acquired through competitive awards to stimulate the development of external grant proposals.

#### **INVITED LECTURES (Last 10 Years):**

- 2004 "Geology of Texas Dimension Stone", Association for Preservation Technology Texas Chapter and the Building Industry Council of Preservation, 2004 Preservation Day Seminar, Austin, TX
- 2003 "Historical Silver Mining in Central Texas: Myth vs. Reality", Society for Mining, Metallurgy, and Exploration, Central Texas Section, Austin, TX.
- 2002 "The Economic Geology of Microbes: Relation between Mineral Resources and Bacterial Processes", and "Giant Pliocene porphyry-skarn Cu-Au deposits, Ertsberg District, Papua, Indonesia: Exploration, production and research in a challenging environment": Society of Economic Geologists Thayer Lindsley Lecture Tour (17 presentations at 12 sites in the U.S., Canada, and Mexico)
- 2001 "Origin of the Tertiary sandstone-hosted Jinding Zn-Pb-Ag deposit, Yunnan, China" Society of Economic Geologists' Symposium on Sediment-Hosted Lead-Zinc Deposits, Geological Society of America Annual Meeting, Boston, MA.

- 2000 "Formation of giant Pliocene porphyry-skarn Cu-Au deposits, Ertsberg District, Irian Jaya, Indonesia", and "Dynamic interaction of salt tectonics, depositional and diagenetic systems, and mineralization in the Gulf of Mexico Basin", Institute for Science and Technology, Xi'an, China.
- "Formation of giant Pliocene porphyry-skarn Cu-Au deposits, Ertsberg District, Irian Jaya, Indonesia", and "Dynamic interaction of salt tectonics, depositional and diagenetic systems, and mineralization in the Gulf of Mexico Basin", Xinjiang Bureau of Geology and Mineral Resources, Urumqi, China.
- "Origin of the Tertiary sandstone-hosted Jinding Zn-Pb-Ag deposit, Yunnan, China", Society of Economic Geologists' Symposium on New Silver Deposits, Society for Mining, Metallurgy, and Exploration, Salt Lake City, UT.
- "Relation of energy and mineral resources in the Gulf of Mexico Basin to the dynamic interaction of salt tectonics, depositional systems, and formation waters", Department of Geosciences, The University of Tulsa, Tulsa, OK
- 1999 "A Century of Fire and Brimstone: The Rise and Fall of the Gulf Coast Frasch Sulfur Industry", Austin Geological Society, Austin, TX
- "Delaware Basin sulfur deposits: Genetic relations among evaporites, petroleum, bacteria, formation waters, and tectonics", New Mexico Bureau of Mines and Mineral Resources, Socorro, NM
- "Formation of the supergiant Grasberg porphyry Cu-Au deposit, Irian Jaya, Indonesia", Department of Geology, University of Chile, Santiago, Chile.
- "Metallogeny of Zn-Pb-Ag deposits in sedimentary basins: characteristics and genesis of the Tertiary sandstone-hosted Jinding Zn-Pb deposit, Yunnan, China", Denver Regional Exploration Geologists Society, Denver, CO.
- "A century of fire and brimstone: The rise and fall of the Gulf Coast Frasch sulfur industry", Society for Mining, Metallurgy, and Exploration, Central Texas Section, San Marcos, TX.
- 1998 "Formation of giant porphyry-skarn Cu-Au deposits associated with Pliocene intrusions into a continental margin, Ertsberg District, Irian Jaya, Indonesia", Department of Earth Science, Dalhousie University, Halifax, Nova Scotia, Canada.
- "Dynamic interaction of salt tectonics, depositional and diagenetic systems, and mineralization in the Gulf of Mexico Basin", Centre for Petroleum Geology and Geophysics, University of Adelaide, South Australia, Australia.
- "Exploration and production of mineral resources in a challenging environment, Ertsberg Cu-Au District, Irian Jaya, Indonesia", and "Dynamic interaction of salt tectonics, depositional and diagenetic systems, and mineralization in the Gulf of Mexico Basin", Geological Society of Australia, Broken Hill Section, New South Wales, Australia
- "Dynamic interaction of salt tectonics, depositional and diagenetic systems, and mineralization in sedimentary basins: The Gulf of Mexico Basin example" (Turner Lecture), and "Exploration

- and production of mineral resources in a challenging environment, Ertsberg Cu-Au District, Irian Jaya, Indonesia", Department of Geological Sciences, University of Michigan, Ann Arbor, MI
- 1997 "Formation of giant porphyry-skarn Cu-Au deposits associated with Pliocene intrusions into a continental margin, Ertsberg District, Irian Jaya, Indonesia", Mackay School of Mines, University of Nevada, Reno, NV
- "Challenges in exploration and production of mineral resources in a dynamic environment, Ertsberg Cu-Au District, Irian Jaya, Indonesia", Society for Mining, Metallurgy, and Exploration, Central Texas Section, San Antonio, TX.
- 1996 "Magmatic-hydrothermal – epithermal transition in the Ertsberg district, Irian Jaya, Indonesia", Society of Economic Geologists symposium on the magmatic-hydrothermal – epithermal transition, Geological Society of America Annual Meeting, Denver, CO
- "Bacterial processes in salt dome cap rock formation, Gulf Coast Basin, southern North America", Symposium on Geomicrobiology, Geological Association of Canada, Winnipeg, Manitoba
- "Pliocene porphyry-skarn Cu-Au deposits of the Ertsberg district, Irian Jaya, Indonesia", Department of Geological Sciences, University of Tennessee, Knoxville, TN
- 1995 "Development of giant copper-gold deposits associated with Pliocene intrusions into a continental margin, Ertsberg district, Irian Jaya, Indonesia", Economic Geology Division, Geological Society of South Africa - Kalahari Branch, Kuruman, South Africa.
- "Metallic deposits in the Gulf Coast Basin of southern North America: Diverse mineralization styles in a young sedimentary basin", Society of Economic Geologists, International Field Conference on Carbonate-hosted Lead-Zinc Deposits, St. Louis, MO.
- "The origin of zinc-barite-fluorite deposits in Lower Ordovician carbonates, Tennessee", Irish Association for Economic Geology Weekend Course, Models for Carbonate-hosted Base Metal Deposits, Killarney, Ireland.
- "Metallic deposits in the Gulf Coast Basin of southern North America: Diverse mineralization styles in a young sedimentary basin", Irish Association for Economic Geology Weekend Course, Models for Carbonate-hosted Base Metal Deposits, Killarney, Ireland.
- "Diverse styles of sediment-hosted mineralization in the Gulf Coast Basin", Symposium on The Impact of New Ideas in Southeastern Geology on Ore Depositional Models, Geological Society of America Southeastern Section, Knoxville, TN.
- "Pliocene porphyry-skarn Cu-Au deposits of the Ertsberg district, Irian Jaya, Indonesia", Department of Geological Sciences, University of Texas at El Paso, El Paso, TX
- "Pliocene porphyry-skarn Cu-Au deposits of the Ertsberg district, Irian Jaya, Indonesia", Department of Geological Sciences, New Mexico State University, Las Cruces, NM.
- "Pliocene porphyry-skarn Cu-Au deposits of the Ertsberg district, Irian Jaya, Indonesia", Department of Earth Sciences, Tennessee Technological University, Cookeville, TN.
- 1994 "Sedimentary Pb-Zn Deposits", Two-day short course, The Earth Resources Foundation, University of Sydney, Sydney, New South Wales, Australia.

"Skarn Cu-Au deposits of the Ertsberg district, Irian Jaya, Indonesia", Symposium on Gold and Base Metal Skarns, Department of Geology and Geophysics, University of Sydney.

"Zinc-lead-silver mineralization in sedimentary environments: Lessons from the Gulf Coast Basin": Department of Geology, Colorado School of Mines, Golden, CO.

1993 "Salt structures and Pb-Zn-Ag-Ba mineralization in the Gulf Coast Basin, southern North America" and "Porphyry-skarn Cu-Au deposits, Ertsberg district, Irian Jaya, Indonesia", Department of Geology and Mineral Resources, China University of Geosciences, Beijing.