National Association of Geoscience Teachers

Cosponsored with
Joint Oceanographic Institutions, Inc.

NAGT Distinguished Lecturer Series:

Fall 2005 and Spring 2006

Host an NAGT Distinguished Speaker

Topics for workshops, seminars or talks:

- Innovative teaching techniques,
- Curricula reform,
- Cutting-edge Geoscience education research,
- Research opportunities in EARTHSCOPE, and
- Results and opportunities in scientific ocean drilling (Supported by Joint Oceanographic Institutions, Inc.)

Tanya Atwater:

Dept. of Geological Sciences, U. C Santa Barbara, Santa Barbara, CA

How the West was made: using the last half billion years of geologic history in western North America to illuminate continental plate tectonic processes.

Cenozoic Plate Tectonics in the Western United States, from subduction to the San Andreas – a great illustration of the power of quantitative plate tectonics where oceanic and continental realms entangle.

Plate tectonics, ice ages, sea level shifts, marine terraces, volcanoes, earthquakes, tsunamis, etc: bringing Earth processes alive with computer animations.

Tanya Atwater was educated at M.I.T., U.C. Berkeley, and Scripps Inst. of Oceanography. After earning her PhD in 1972, she was a professor at M.I.T., then joined the U.C.S.B. faculty in 1980. Atwater researches many aspects of plate tectonics, especially the evolution of western North America and the San Andreas fault system. She teaches at all levels, including many public education projects. Her honors include; N.S.F. Director's Award for Distinguished Teaching Scholars; the G.S.A. Structure and Tectonics Best Paper Award; and election to the National Academy of Sciences. Atwater also runs the UCSB Educational Multimedia Visualization Center which produces educational geo-animations and visualization tools. To download animations, visit http://emvc.geol.ucsb.edu/.

Ed Geary:

University Corporation for Atmospheric Research, Science Education Program Manager, Boulder, CO

Revolutionizing Earth and Space Science Education in the 21st Century: Roles of Individuals and Organizations.

Integrating Content, Technology, Pedagogy, and Assessment to enhance Inquiry-based Learning.

The Next Generation GLOBE Program: Student Investigations of the Earth System.

Ed Geary is passionate about revolutionizing Earth and space science education in grades K-16 and co-editor of "Blueprint for Change" report. He is currently supporting Digital Library and GLOBE program activities at UCAR. Ed is past President of NAGT, a former professor of Geology and Education and past Director of Education and Outreach at the GSA. He has given numerous talks and workshops related to geoscience education reform, professional development, classroom use of technology, scientist-teacher-student partnerships, and development of digital library collections.

Frank Hall

National Science Foundation, Washington, DC

Using Earth Systems Science in the Preparation of Preservice Elementary School Teachers Issues.

Answers for Improving Diversity in e Geosciences.

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Frank Hall is an Associate Professor/Geoscience educator in the Department of Geology and Geophysics, University of New Orleans, who works with inservice and preservice K-12 teachers. He has worked with several programs and committees that focus on educational and diversity issues with the Geosciences, including AGI, AGU, and GSA. Presently, he is serving as a Program Officer within the Division of Elementary Secondary and Informal Education, National Science Foundation.

Michelle Hall:

Science Education Solutions, Inc. Los Alamos, NM

EarthScope: An unprecedented opportunity for teaching about Earth.

Building Effective University - School Partnerships.

Visualizing Earth: What works for students?

Michelle Hall is an assistant professor of Geosciences with a research emphasis on geoscience education. She is active in teacher preparation and professional development and has developed curriculum for the high school and introductory college level student that uses GIS to investigate Earth processes. She is also one of the leaders of the education and outreach effort associated with the EarthScope project.

Bruce Herbert:

Geology & Geophysics, Texas A&M University, College Station, TX

Developing Student Understanding of Complex Earth Systems.

Seeking Synergy: Designing Programs that Integrate Research and Education.

Understanding Student Learning: Views from the Learning and Cognitive Sciences.

Bruce Herbert is Associate Professor of biogeochemistry and Associate Director of Geosciences with the Information Technology in Science (ITS) Center for Learning and Teaching at Texas A&M University. He is also currently principal investigator of an NSF-sponsored professional development program for intern STEM teachers seeking alternative certification. Dr. Herbert is addressing a number of educational issues and research topics, including the design and implementation of authentic inquiry in the classroom, restructuring curriculum to focus on model-based learning, the use of multiple representations (i.e. physical models, visualizations, and simulations) to support student understanding of complex earth and environmental systems, and programmatic design that builds synergy between scientific research and education.

Jackie Huntoon

Department of Geology, Michigan Technological University, Houghton, MI

Broadening Participation in the Geosciences: Why It's Important and How to go about it.

Using Field-Based Experiences to Improve Earth Science Teacher Training.

The Role of Assessment in Geoscience Education.

Jackie Huntoon is Dean of the Graduate School and Professor of Geology at Michigan Technological University. From 2003-2005, she served as Program Director for Diversity and Education in the Directorate for Geosciences at NSF. Jackie teaches courses at the undergraduate and graduate levels, including courses for Earth science teachers. She has developed innovative field courses, participated in development of assessment instruments for education projects, and taken a leading role in her university's effort to broaden participation in science and engineering.

Julie Libarkin:

Dept. of Geological Sciences, Ohio University Athens, OH

Tale of Three Theories: Development and Use of the Geoscience Concept Inventory.

When Wrong Answers Ask the Right Questions about Student Learning: Conceptual Change and Assessment in College Science Classrooms.

Pictures Say a Thousand Words: Assessment of Alternative Conceptions through Analysis of Student-Generated and Student-Augmented Drawings.

Julie Libarkin is co-developer of the Geoscience Concept Inventory, a valid and reliable instrument for assessment of entry-level geoscience. She is currently an Assistant Professor of Geological Sciences at Ohio University, and an Associate Editor of the Journal of Geoscience Education. Her research is devoted to assessing teaching effectiveness and is actively engaged in studying student conceptions, cognition, and conceptual change in higher education.

Sharon Locke:

Department of Geosciences, University of Southern Maine, Portland.

Universal Design in Education: Principles and Implications for the Future of Geoscience Education.

Can We Achieve Equal Access to Geosciences for All Students?

Fostering and Sustaining Interest in Science through Regional Alliances.

Sharon Locke has co-directed three national programs that support increased participation of students with disabilities in science, including the NSF-funded Eastern Regional Alliance for Science, Technology, Engineering, and Mathematics (EAST). She led development of the Earth System Science Ideabook, a resource for applying universal design principles to earth science teaching and learning, and has lectured internationally on the accessibility of the geosciences.

David Steer (left) and David McConnell (right):

Department of Geology, University of Akron, Akron

The Tourist the Gunslinger and the Gardener: Rethinking Metaphors of Teaching and Learning to Enhance Student Reasoning.

Technology in Support of Effective Pedagogy: Peer Instruction, Electronic Response Systems, and Good Practice in Undergraduate Education.

Teaching for Understanding: Less Talk and More Action in Introductory Science Courses.

David McConnell and David Steer are Professor and Associate Professor, respectively, in the Department of Geology at the University of Akron. Their research focuses on the development of resources to improve learning in large general education geoscience classes. The Davids have made more than fifty presentations of their research at professional meetings, workshops, and seminars, and together have received over $1.2 million in funding for educational research projects from national and state agencies.

Ellen Metzger:

Department of Geology, San José State University, San Jose, CA

Trends in Earth Science Education: Challenges and Solutions.

How Earth Scientists Can Reach Out To Teachers: A Model from the Bay Area Earth Science Institute.

Designing an Introductory Earth Science Course for Prospective Teachers.

Ellen Metzger is a professor of Geology and Science Education at San José State University. She co-directs the Bay Area Earth Science Institute (BAESI), a professional development program for teachers that was founded in 1990, and teaches Earth Systems and the Environment, an introductory earth science course for educators. Ellen has served on the Board of Directors of the California Science Teachers Association and as past Chair of the Geoscience Education Division of the Geological Society of America.

Paul Morin:

Department of Geology and Geophysics, University of Minnesota, Minneapolis, MN

The GeoWall, Using Stereo Projection in the Non-major Geoscience Classroom.

Innovative uses of Geoscience Visualization in a Museum Setting.

Paul Morin has been instrumental in bringing Scientific Visualization to the Earth Science classroom with his work at the Department of Geology and Geophysics and the National Center for Earth-surface Dynamics. His work has led to the development of the GeoWall (www.geowall.org), an inexpensive low-end virtual reality system now used at over 70 undergraduate institutions around the world. Morin is also contributing to the Science Museum of Minnesota's Big Back Yard, a 1.2 acre, outdoor biogeomorphology exhibit. He has contributed to over 10 earth science textbooks, numerous PBS science programs and the Encyclopedia Britannica.

Carol O'Donnell:

The George Washington University, Graduate School of Education and Human Development Department of Teacher Preparation and Special Education, Washington, DC

Examining the Effects of Inquiry-based Science on Student Learning.

Designing and Using Models to Teach Earth and Space Science .

Teaching Teachers: Geoscientists and K-12 Teachers Working Together to Improve Pre-service and In-service Teacher Content Knowledge.

Carol O'Donnell is Senior Research Associate and Project Director of George Washington University's Scaling up Curriculum for Achievement, Learning, and Equity Project. Carol served as the Geosciences Curriculum Developer for the National Science Resources Center, an organization jointly operated by the Smithsonian Institution and National Academies. Her book, Catastrophic Events, received the Mark Trail Award in 2003. Carol has given numerous talks and workshops nationally related to science education reform.

Christina Ravelo:

University of California, Santa Cruz, Santa Cruz, CA

Global Climate Change: Lessons from Ocean Drilling and the Discovery of Earth's Geologic Past.

Christina Ravelo is a professor of Ocean Sciences at the University of California, Santa Cruz. Her research and teaching interests are focused on paleoceanography and global climate change. She is the current director of the Center on the Dynamics and Evolution of the Land-Sea Interface, a UCSC organization that fosters interdisciplinary research on coastal processes. She has been involved in the Ocean Drilling Program for many years, as a shipboard scientist and as a member of its advisory committees.

Eric Riggs:

Department of Geological Sciences, Center for Research in Mathematics and Science Education (CRMSE), San Diego State University, San Diego, CA

Toward an Understanding of Field Mapping Expertise: Student Navigation as a Measure of Problem Solving Skill.

Geoscience Education in Native America: Working with Indigenous Communities' Knowledge and "Sense of Place".

Assessing the Educational Benefits of Field-based Teaching for Pre-service Teachers and Other Non-majors: Research Results, Applications, and Best Practices.

Eric Riggs is an associate professor of geoscience education and geology and leads the Geoscience Education Research Group at San Diego State University. The Riggs GeoEd Group studies many related aspects of field-based teaching and learning in the geosciences, focusing on issues of geoscience knowledge construction, spatial cognition related to geoscience expertise, and cross-cultural education. Riggs is the co-founder of the Indigenous Earth Sciences Project, a research and outreach effort which works to make geoscience education accessible and useful to Native Americans in Southern California and across North America

Jill K. Singer:

Professor of Earth Sciences and Director, Undergraduate Research Office, SUNY, College at Buffalo

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Interdisciplinary Undergraduate Research Opportunities: Taking Advantage of an Urban Setting

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The Follies of Lotus Bay: an Earth Scientist's Role in Environmental Policy

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Establishing and Institutionalizing Undergraduate Research Programs in Your Department and On Your Campus

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Jill Singer is a professor of Earth Sciences at Buffalo State College (State University of New York system (SUNY)) and Director of the Buffalo State Office of Undergraduate Research. From 2001-2003, she took a two-year leave of absence to serve as a Program Director in the Division of Undergraduate Education at NSF. She served as President of the Council of Undergraduate Research (CUR) from 2003-2004 and for the past seven years has been a co-organizer and facilitator for CUR's multi-day workshop on "Institutionalizing Undergraduate Research". At Buffalo State College, Jill teaches sedimentology, oceanography, and a variety of environmental courses. Her research takes advantage of local environmental challenges and provides opportunities for undergraduates to conduct research.

Marilyn J. Suiter:

Geoscience Educator, Arlington, VA

Implementing STEM Education for ALL Students.

Earth Science Education: Challenges and Opportunities.

Marilyn Suiter is a geologist and educator with more than twenty years of experience. She is currently a program director in the Education and Human Resources Directorate (EHR) at the National Science Foundation (NSF). Her responsibilities are in (geo) science education and diversity issues as they are implemented in K-12, undergraduate, and graduate education. Marilyn's highly varied career has included positions as Director of Human Resources and Career Development at the American Geological Institute, Exploration Geologist for Cities Service Oil & Gas, geologist for the U.S. Geological Survey, pre-college science teacher in grades 5-12 in the Philadelphia Public Schools, and adjunct faculty member in geoscience at American University. In addition to her wide-ranging interests and experience in geoscience education issues and demography of the geoscience community, she retains a special interest in activities for underrepresented populations. (Suiter cannot represent the NSF in these visits, and declines honoraria.)

Mike Taber:

University of Northern Colorado, Department of Earth Sciences, Greely, CO

Building Geoscience Content Knowledge and Inquiry Vocabularies using WorldWatcher data visualization tool.

Using Data Visualization tools in Problem-based Instruction.

Data User Ability: How students make use of data in data-based decisions.

Application of the Learning for Use Instructional Model in Undergraduate Education

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Mike Taber is an assistant professor of Earth Science at the University of Northern Colorado. Mike has extensive experience in science education, having served as a classroom teacher for six years and involved in numerous curriculum projects. Mike is an advocate of using data in teaching inquiry. In addition, Mike is the Director for the Colorado Alliance for Science, an organization dedicated to the shaping of science education through informed policy. Mike is a co-PI for the Digital Library for Earth System.

Marta Torres:

Oregon State University, Corvallis, OR

Life-long Learning Opportunities in Oceanography: A Project Integrating Ocean Sciences into Adult Basic Education Programs.

Methane-ice in Marine Sediments: Where, How and Why we Study these Deposits?

Submarine Springs: The Hot and the Cold.

Marta Torres is an associate professor of oceanography at Oregon State University. She is interested in using chemistry to unravel processes that occur within sediments at tectonic plate boundaries, where water with a chemical composition different from bottom seawater is expelled at the seafloor, in what oceanographers call "cold seeps". Marta has studied cold seeps along the entire Pacific Rim. She conducts her research using conventional research vessels, a deep-sea drilling platform, remotely operated and manned submersibles. Marta is also interested in taking advantage of the fascinating and interdisciplinary nature of ocean sciences to enhance science and numeracy skills for Americans of all ages.

Application to request a Distinguished Speaker, or for funding costs to cover a Speaker's Travel Expenses

Name of Contact Person: _____ Phone: _____
Mailing address: _____ FAX: _____
_____ email: _____
_____
_____

Speaker choice(s): List in order of preference
1) _____
2) _____
3) _____
4) _____

Expected audiences (check all that apply)
_____ Faculty teaching primarily undergraduate classes
_____ Faculty teaching both u' graduate & graduate classes
_____ Graduate students interested in academic careers
_____ Undergraduate students interested in K-12 education
_____ K-12 teachers

Has your department been previously funded for an NAGT Distinguished Speaker visit? If so, who and when?
_____

Please describe what your Department/Institution would hope to achieve by the visit
_____
_____
_____
_____
_____

If this application is funded NAGT will pay travel expenses and honorarium for the Distinguished Speaker.

By applying for funding the Department/Institution agrees to the following:
1) Before the visit, the Department will fill out a brief questionnaire describing the curriculum and styles of teaching currently used, and what the Department hopes to achieve by the visit.
2) Before the visit, the Department will make arrangements to invite neighboring schools to the Speaker's visit
3) The Department will cover the speaker's local food, accommodation and travel costs, the costs to photocopy workshop materials, and the cost of a substitute, if the Speaker is a high school teacher.
4) Following the visit, the Department will submit an evaluation of the visit
5) The Department will submit a report to the Speaker Coordinator six months after the visit to report on changes stimulated by the Speaker's visit.

Signature of Department Chair: _____ Date: _____

Return the Application Form or submit equivalent information to:
Ian MacGregor: 31 Crestview Drive, Napa, CA 94558; Phone:707-427-8864; email: nagt@gordonvalley.com

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Instructions:
To schedule a visit (Funded or Standard) please provide the above information to
Ian MacGregor**:** 31 Crestview Drive, Napa, CA 94558; Phone:707-427-8864; email: nagt@gordonvalley.com

Funded Visits: Funding to cover the cost of a Distinguished Speaker's travel to and from a host institution is available on a first-come-first-serve basis. Responses to the competition will be communicated within two weeks. If the application is funded, we will work with you to schedule a Speaker's visit. Your department will be expected to pay for a Speaker's local expenses, costs for duplicating a reasonable volume of workshop materials, and the cost of hiring a substitute, if the teacher is a pre-college teacher.

Standard Visits: If you do not wish to apply for funding to cover a Distinguished Speaker's travel, do not fill out the application. Instead, contact Ian MacGregor to schedule a visit. A host department is expected to pay for a Speaker's travel and local expenses, expenses for duplicating a reasonable volume of workshop materials, and the cost of hiring a substitute, if the Speaker is a pre-college

teacher.