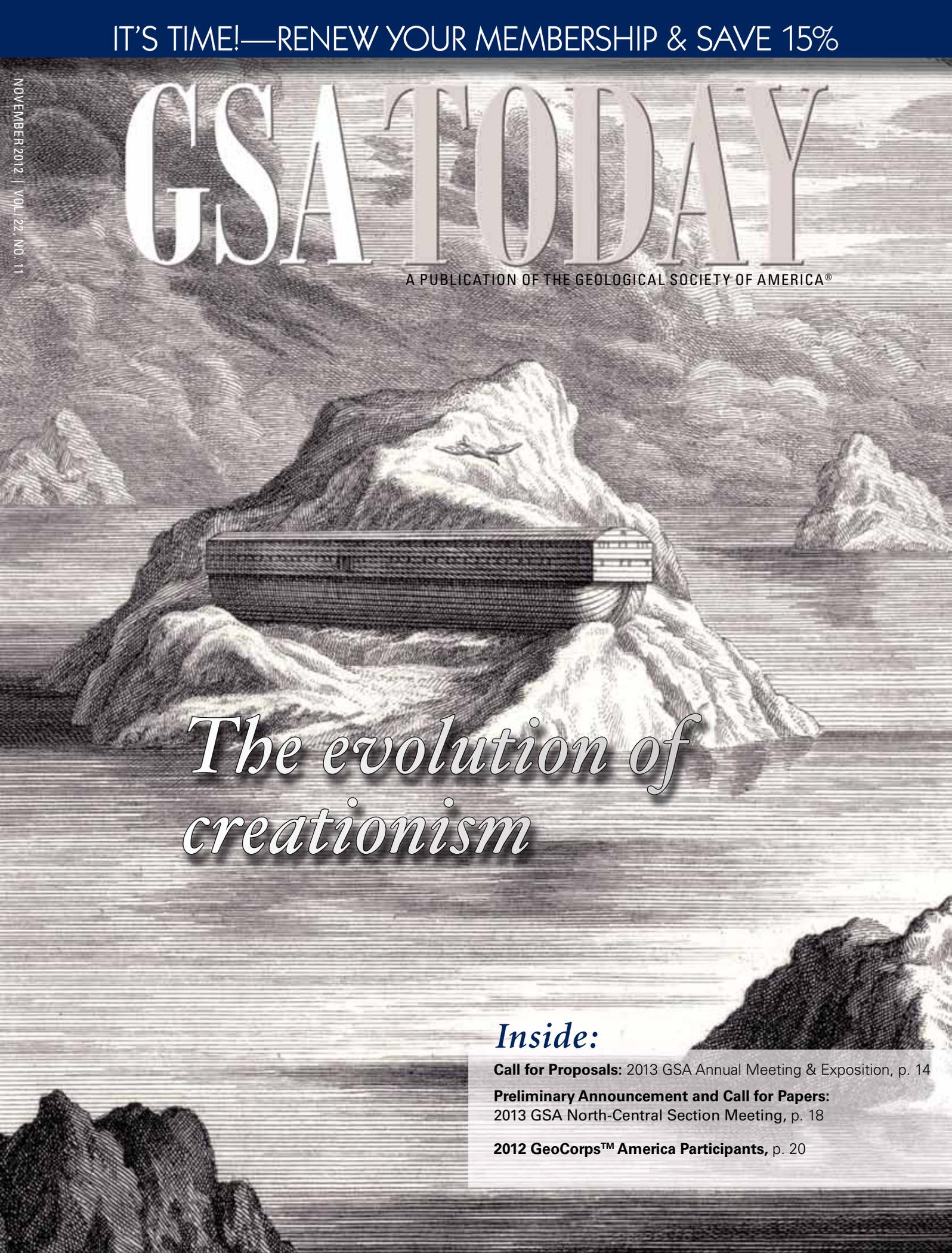


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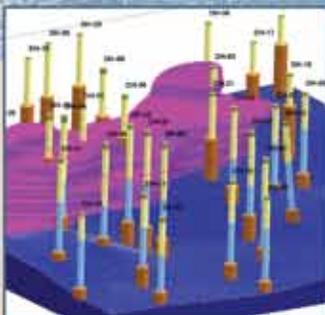
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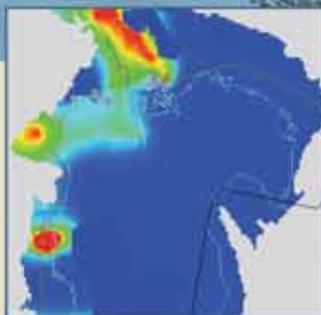


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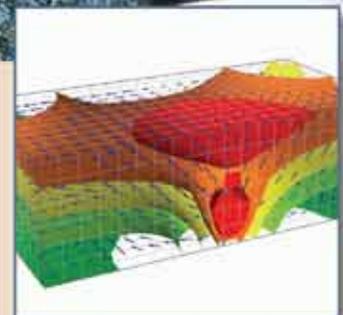


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David R. Montgomery

Cover: Noah's Ark as the floodwaters recede as depicted in plate LXII to illustrate Genesis 8:8–9 in Johann Scheuchzer's *Physica Sacra* (*Sacred Physics*, 1731). See related article, p. 4–9.



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The evolution of creationism

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I do not feel obliged to believe that the same God who has endowed us with senses, reason, and intellect has intended us to forego their use. —Galileo Galilei

ABSTRACT

For centuries, natural philosophers, their scientific successors, and theologians alike sought to explain the physical and natural world. The now common cultural narrative of perpetual conflict between science and religion simplifies the arguments and struggles of the past and overlooks cross-pollination between those who embraced faith and reason as the keys to understanding earth history. When geologists unequivocally dismissed the idea of a global flood and recognized Earth's antiquity, many conservative theologians acknowledged that there was more to the past than literally spelled out in Genesis, the opening chapter of the Bible. But some Christians—those we now call creationists—rejected this perspective and chose to see geology as a threat to their faith. In so doing, they abandoned faith in reason and cast off a long-standing theological tradition that rocks don't lie.

INTRODUCTION

The story of historical views on Noah's Flood shows how there is far more to the story of the relationship between science and religion than the simple portrayal of a long-running feud (Gillespie, 1951; Glacken, 1967; Davies, 1969; Rudwick, 2005; Montgomery, 2012). By the end of the nineteenth century, conservative Christians generally accepted that there was no geological support for reading Noah's Flood as a globe-wrecking deluge and that natural revelations established by science should guide biblical interpretation. Even the original fundamentalists accepted geologic evidence that contradicted the view of a six-day creation followed by Noah's Flood as all there was to earth history (Numbers, 1993). But the forerunners of modern creationists chose to defend their preferred literal reading of scripture no matter what the rocks revealed. Dismissing the findings of geologists, they rejected reason in the name of faith. In this sense, modern creationism evolved in response to geological discoveries. The following brief review traces aspects of this story to illustrate how geological debates evolved into theological schisms anchored by creationist views with no scientific currency.

FAITH IN NATURE

For the first millennium of Christianity, major theologians embraced knowledge of the natural world in order to defend against pagan challenges to biblical authority. Saint Augustine

(354–413), Thomas Aquinas (1225–1274), and John Calvin (1509–1564) all endorsed reason as the way to learn about the world. Augustine was among the first to caution against advocating for biblical interpretations that conflicted with what one could observe for oneself. Centuries later, Aquinas praised the pursuit of knowledge and insight gained from experience reading God's other book—nature.

Writing at the time of the Reformation, Calvin, too, considered the revelations of both nature and the Bible as fundamental truths. In his *Institutes of the Christian Religion* (1559), Calvin explicitly embraced the idea of respecting natural truths revealed through the study of nature: "If we regard the Spirit of God as the sole fountain of truth, we shall neither reject the truth itself, nor despise it wherever it shall appear, unless we wish to dishonor the Spirit of God" (McNeill, ed., 1960, p. 273–274).

Calvin believed in keeping an open mind when it came to evaluating what we can learn about the natural world from observation and experience. In his view, closing one's eyes to the way the world works was to close one's eyes to God.

Augustine, Aquinas, and Calvin all believed that Noah's Flood was a global flood. They interpreted fossil seashells found in rocks as compelling proof—how else could the bones of marine creatures have ended up entombed in rocks high in the mountains?

Biblical interpretations accommodated new discoveries as knowledge of the natural world grew, because theologians adhered to the principle that God's works in the natural world could not conflict with His Word in the Bible. Generation after generation of natural philosophers slowly uncovered facts inconsistent with a global flood, making it increasingly implausible to understand earth history in ways consistent with traditional literal interpretations of the Bible.

FINDING TIME

In 1669, when Steno, the venerated grandfather of geology, laid down his principles for reading the rock record, he interpreted his observations of the Tuscan landscape as recording six stages, one of which corresponded to Noah's Flood (Fig. 1). Steno's insights framed how to read earth history directly from the rocks. In arguing that the Flood laid down strata that subsequently collapsed to form today's topography, Steno indirectly introduced the idea of tectonic controls on landforms, a foundational concept of modern geomorphology.

Steno's little book, with its simple diagrams, formalized how to read earth history using the basic principles of geometry. The key wasn't the underlying mathematical symmetry astronomers found in the heavens; it was simple rules based on what one could see for oneself. Before Steno, only a curious few read beyond the cover of nature's great book to ponder the relationship between rocks and the lay of the land.

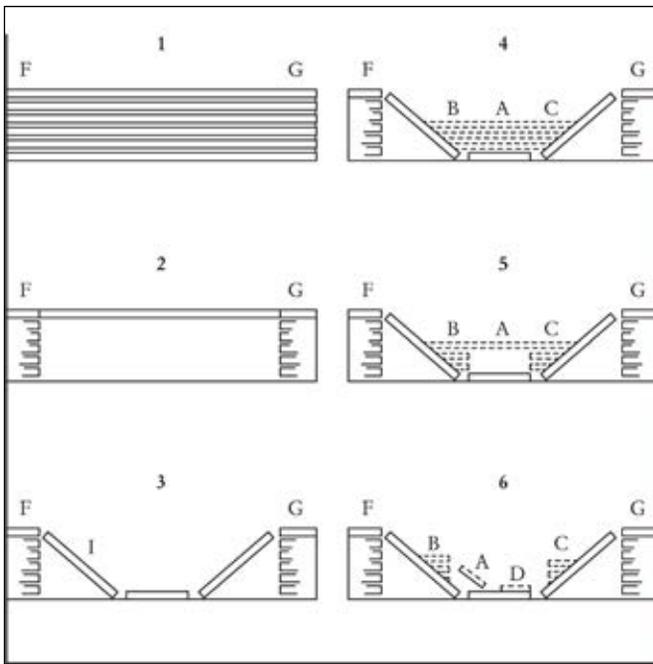


Figure 1. Steno's six-stage model for the formation of the landscape around Florence, involving (1) precipitation of fossil-free sedimentary rocks into a universal ocean; (2) excavation by fire or water of great subterranean caverns; (3) collapse of undermined continents and the inundation of newly formed valleys in a great flood (Noah's Flood); (4) deposition of layered sedimentary rocks containing fossils as the floodwaters receded; (5) renewed undermining of younger rocks in valleys; and (6) a final round of collapse to create modern topography. Letters serve to identify the same locations or rock layers in successive panels.



Figure 2. James Hutton's unconformity at Siccar Point, Scotland—the contact between the gently inclined Devonian Old Red Sandstone and vertically dipping Silurian graywacke that established a compelling case for the vast scope of geologic time. The expanse of time required to uplift and erode the two mountain ranges that were the source for the sand in these deposits was unimaginable to Hutton. Photo by David R. Montgomery.

A century later, geologic history began to challenge theological tradition after discoveries like James Hutton's unconformity, separating two distinct sandstones, at Siccar Point (Fig. 2) demonstrated that Earth's history was too complicated to be accounted for by a single flood, no matter how big. Mainstream theologians willing to allow that there was more to the geological story than laid out in the Bible, and that the days of creation may have been allegorical, were less inclined to give up on the reality of a global flood. Many believed that the biblical flood inaugurated the most recent geological age. The lack of human remains in rocks thought to pre-date the flood was widely considered to confirm this view.

Although it is commonly assumed that eighteenth-century Christian theologians were opposed to science, some orthodox churchmen openly accepted the idea that Earth was ancient. In 1785, the Reverend James Douglas presented *A Dissertation on the Antiquity of the Earth* to the Royal Society. Douglas noted that sound geological observations supported the idea that the world was much older than the traditional 6000 years inferred from biblical interpretation: "Many well-informed persons have therefore been inclined to suppose that the earth was created in six expanses of time instead of six days" (p. 40).

By 1800, the question under debate among natural philosophers was whether Earth was tens of thousands or millions of years old. Some, however, refused to consider geologic evidence and simply rejected an old Earth outright. In his *Genius of Christianity* (1802), François-René de Chateaubriand (1768–1848) argued that God "created the world with all the marks of antiquity and decay" (Roberts, 2007, p. 43). This new idea that God made the world to appear ancient—and therefore one could not investigate earth history by studying Earth itself—broke with tradition and garnered little support in the nineteenth century.

TESTIMONY OF THE ROCKS

In his influential *Natural Theology* (1802), Reverend William Paley echoed Aquinas and argued that because the Bible and nature shared the same author, scientific revelations that contradicted biblical interpretations provided natural guidance for better interpreting scripture. As realization grew that the world was unimaginably old, those seeking to reconcile biblical interpretation with geological findings employed two primary arguments. The day-age theory held that each day in the biblical week of creation corresponded to a geologic or cosmic age. The other theory, known as the gap theory, held that God created the world long ago but remodeled it for human use a few thousand years ago. The time in between wasn't recorded in the Bible, creating an indeterminate gap between the first two verses of Genesis.

In 1807, London's Geological Society was founded to promote the elevation of facts and observations over imaginative theories. Central to the issue of whether a global flood shaped the world was the question of what carved valleys. Did topography form beneath the waters of a great flood, or did rivers slowly cut their own paths? Studies of regional geology were seen as key to such fundamental questions.

In his inaugural address to the Princeton Theological Seminary in 1812, Archibald Alexander (1772–1851) promoted the need for scientific literacy among those preparing for the ministry. Alexander noted that natural history, and geology in particular, could help resolve difficult or ambiguous Bible passages. He preached that

Christians should respect truth in all its forms because failure to take heed of scientific knowledge would only breed contempt for believers and hinder the spreading of the Gospel.

At the same time, geologists moved the search for evidence of Noah's Flood out of the rocks and up into surficial deposits and the form of topography as they continued to see the biblical deluge as a geologically significant event. In his *Reliquiae Diluvianae* (*Relics of the Flood*, 1823) Oxford's first geology professor, Reverend William Buckland, gathered facts thought to demonstrate the reality of a global flood. He described great accumulations of bones he believed were deposited by an enormous flood "immediately antecedent to the formation of those superficial and almost universal deposits of loam and gravel, which seems impossible to account for unless we ascribe them to a transient deluge, affecting universally, simultaneously, and at no very distant period, the entire surface of our planet" (Buckland, 1823, p. 146).

Buckland went on to admire the way in which originally horizontal strata were inclined such that mineral deposits and coal were accessible to miners, as well as how convenient it was that fertile soils were found in flat valley bottoms. Like many of his contemporaries, he thought geological evidence confirmed the Genesis stories and showed how well the world was designed for human use.

After several decades studying Europe's rocks and surficial deposits, Buckland eventually admitted to having let his imagination run wild in his zeal to defend a global flood. He formally reversed course when he was asked to prepare a volume in a series of treatises illustrating "the power, wisdom, and goodness of God, as manifested in the creation," which was commissioned by the will of the Earl of Bridgewater. In his 1836 volume, Buckland acknowledged new geological discoveries that contradicted his earlier views. There was no geological evidence of a global flood after all.

Shortly after Buckland's recantation, Louis Agassiz invoked stray boulders in the Swiss Alps, grooved rock outcrops, and scratches on the underside of a rock overhang near Edinburgh to convince geologists that most of the evidence traditionally interpreted as resulting from a global flood actually recorded a flood of ice.

Particularly compelling was Charles Lyell's argument that the cinder cones of southern France were too fragile to have survived a global flood. Deep valleys were incised into hard lava flows that could be traced back to their volcanic source in the cinder cones. Thus, the valleys must have been carved after the cinder cones formed. Lyell reasoned that Noah's Flood could not have carved the valleys because any flood capable of carving valleys into solid rock would have swept away the loose cinders that formed the volcanic cones.

In the third volume of his *Principles of Geology* (1833), Lyell concluded that Noah's Flood must have been a local or regional affair rather than a global deluge. Perhaps, he proposed, catastrophic flooding of a low-lying area like the Caspian Sea may have been recorded in the biblical flood story.

By the late nineteenth century, educated Christians widely endorsed the idea of a local flood in response to new geologic evidence. Theologians across denominational bounds endorsed variants of Lyell's Caspian Sea hypothesis as a reasonable way to

generate a devastating flood in humanity's ancestral homeland. In 1863, the *Dictionary of the Bible* dismissed the notion of a universal flood and argued that a local flood in the lower valley of the Euphrates River provided a reasonable interpretation compatible with scripture. Many nineteenth-century Christians—geologists and archaeologists among them—concluded that the biblical flood story described a devastating Mesopotamian flood.

Forerunners of modern creationists adopted a different approach. In 1857, Philip Henry Gosse, a leading British naturalist, published *Omphalos* ("bellybutton" in Greek), in which he argued that Earth's apparent antiquity was an illusion. In his view, all the world's strata, fossils, and even fossil footprints were created at the same time, along with glacial furrows and polished rocks, evidence for the retreat of Niagara Falls, and mammoth bones gnawed by wolves. Confident he had the answer for the geological problems of the age of the world and the effects of the Flood, like Chateaubriand, he too thought God simply made the world to look old. Geologic evidence of past epochs of earth history was created to appear as if "all the preceding eras of its history had been real" (Gosse, 1857, p. 351).

Gosse argued that because all organic life exists in a cycle of birth, growth, decline, and death, everything must have started somewhere within this cycle back at the Creation. Adam was not created as a fertilized embryo, for he had no mother. Gosse professed that as surely as the first man had a bellybutton, trees were created with rings and rocks with fossils. Victorian minds ridiculed mercilessly his idea that God preloaded fossils into rocks back at the original Creation.

THE ROOTS OF CREATIONISM

The roots of modern creationism run directly back to George McCready Price (1870–1963), an amateur geologist with no formal training. In a book designed to look like a geology textbook, Price (1923) asserted that there was no order to the fossil record. Rejecting the idea of fossil succession, he argued that the succession of organisms that geologists read in the fossil record was really just a mixed-up sampling of communities that lived in different parts of the antediluvian world. He considered the fossil record too incomplete to confidently reconstruct the past, citing the occasional discovery of animals thought to be extinct and known only from fossils.

Leading fundamentalists praised Price's book, calling it a "great and monumental" work of an "up-to-date scientist"—"a masterpiece of real science" by one of "the world's leading Geologists," and "the sanest, clearest and most irrefutable presentation of the Science of Geology from the standpoint of Creation and the Deluge, ever to see the light of day" (Numbers, 1992, p. 98). But even some of Price's most ardent supporters had questions about his new flood geology. In a 1924 review in the evangelical journal *Bibliotheca Sacra*, the editor credited Price with throwing "a wrench into the smooth running machinery of the evolutionary theory" but wondered why it was that when fossils were found in the wrong order, they were always in exactly the reverse of that predicted by geologists (Numbers, 1992, p. 95). How could strata have gotten flipped upside down after Noah's Flood laid them down if the Bible did not mention subsequent catastrophes? Despite such qualms, fundamentalist proponents of flood geology were

inclined to assess Price's credibility by the conclusions he reached rather than the strength of his arguments or evidence.

Byron Nelson (1893–1972), one of Price's flood geology disciples, reviewed the history of thinking about flood geology in *The Deluge Story in Stone* (1931). In praising Buckland as an upstanding nineteenth-century catastrophist, and overlooking Buckland's famous recantation of Noah's Flood, Nelson glossed over the reasons mainstream geologists abandoned flood geology in the first place. He then blamed the demise of flood geology on education having passed into the hands of men "more or less lacking in religious convictions" (Young, 1995, p. 252).

Other fundamentalist theologians joined in steadfastly defending Price's global flood. Herbert Leupold (1892–1972) dismissed all criticism related to the distribution and migration of animals to and from the ark as pointless. He thought that eruptions of vast amounts of subterranean water caused huge waves that deposited the entire fossil record, drowning mammoth, dinosaur, and man alike. Illustrating just how wide the communication gulf had become between geologists and fundamentalists by the mid-twentieth century, Leupold wondered "when will geologists begin to notice these basic facts?" (Young, 1995, p. 283). Such ignorance of how geologists had already considered, tested, and refuted a global flood helped keep flood geology alive in the twentieth century.

Despite the efforts of Price and his followers, during the first half of the twentieth century, the majority of Christians—and evangelical fundamentalists—continued to endorse attempts to reconcile geology and Genesis. Even prominent anti-evolution crusader Harry Rimmer (1890–1952) acknowledged that Earth was quite ancient and thought the biblical flood was a local affair rather than a global catastrophe. Twentieth-century fundamentalist circles split into young-Earth creationists, who defended a global flood, and old-Earth creationists, who acknowledged geological evidence that we live on an ancient planet but maintained that God fashioned it for eventual human use.

THE BIRTH OF MODERN CREATIONISM

Curiously, the founders of modern young-Earth creationism grounded their unorthodox views in a surprisingly perceptive critique of pre-plate tectonics geology (Montgomery, 2012). John Whitcomb and Henry Morris wrote *The Genesis Flood* (1961), the book that spawned the creationist revival and resurrected evangelical faith in a global flood. Whitcomb, an Old Testament teacher, and Morris, a hydraulic engineer, embraced literal biblical interpretation to argue that the world was a few thousand years old and that Noah's Flood had laid down all the sedimentary rocks before carving the topography we know today. Their lack of geological training did not stop them from claiming that a global flood provided a better explanation for the geologic record than did the theories of geologists.

Following Price, Whitcomb and Morris argued that the stratigraphic column worked out by geologists was fiction because, they believed, it was based primarily on the illusion of fossil succession. Pointing out that if one stacked up the greatest thickness of sedimentary beds in every geological age, the pile would reach more than 100 miles high, they held this ridiculous height to invalidate the conventional geologic column. In coming to this conclusion, they breezed by the facts that the average

thickness of the rocks of any geological age is only a fraction of its maximum thickness and that only a fraction of Earth's dynamic history is preserved in any one region of the planet.

Whitcomb and Morris did not go so far as to suggest that Christians reject geological facts, but maintained that the long and complex history of the planet that geologists read in the rock record was fiction. In their zeal to dismiss conventional geology as a sham, they described it in terms that serve well to describe their own work: "Procrustean interpretations, pure speculation and dogmatic authoritarianism—a system purporting to expound the entire evolutionary history of the earth and its inhabitants, yet all the while filled with innumerable gaps and contradictions" (Whitcomb and Morris, 1961, p. 212).

In their view, the plain meaning of God's words trumped anything science could throw at it. "The instructed Christian knows that the evidences for full divine inspiration of Scripture are far weightier than the evidences for any fact of science" (Whitcomb and Morris, 1961, p. 118).

They read the Bible to determine geologic history and then looked for scientific support for their views—and dismissed or ignored contradictory evidence. They were surprisingly forthright about it: "We take this revealed framework of history as our basic datum, and then try to see how all the pertinent data can be understood in this context" (Whitcomb and Morris, 1961; preface to the 6th printing).

Their view of earth history was based on a literal interpretation of Genesis. In the beginning, at the Creation, God made Earth's core and some kind of crust. Rocks that display evidence of internal deformation, like folds or minerals that form only at high pressures or temperatures, date from the First Day. Over the next week, a tremendous amount of geological work was accomplished, especially on the Third Day, when mountains were thrust up and ocean basins were carved out in a great rush of water as the planet was remodeled into a suitable dominion for man (Fig. 3). All this erosion and deposition formed the non-fossil-bearing sedimentary rocks and carved mountains into them. Several thousand years later, the Flood ripped up the entire surface of the planet, killed everything not aboard the ark, and laid down fossil-bearing sedimentary rocks. Then the present geological era began after a brief Ice Age caused by all the snow accumulating on freshly uplifted mountains. As far as the appearance of great antiquity, it was just that. The world was created to seem old. Whitcomb and Morris simply dismissed fossil evidence for a long history of life "on the basis of overwhelming Biblical evidence" (1961, p. 457) and asserted that it was impossible to learn the age of the world through studying the operation of natural laws now in operation. The idea laughed out of Victorian England took root in Cold War America. Still, at the time, Morris admitted he knew few evangelicals who bought into their views (Numbers, 1992).

One of many awkward facts facing advocates of a global flood is that although most of the world's sedimentary rocks are found on continents, a global flood would have preferentially deposited sediments in low spots, such as ocean basins. Many flood geology proponents adopted the ecological zonation theory of Price's student Harold Clark, which held that geological strata with distinct fossil assemblages represented antediluvian ecological zones. While they argued that the sedimentary cover on the



Figure 3. The third day of Creation as depicted in plate VI to illustrate Genesis 1:9–10 in Johann Scheuchzer's *Physica Sacra* (*Sacred Physics*, 1731).

modern continents was eroded from the ocean basins, this begs the question of how whole ecological communities of organisms and coral reefs could be transported intact and without mixing across great distances to be deposited preserving their original ecological zonation.

CREATIONISM TODAY

When nineteenth-century geologists shelved the idea of a global flood as the central event in earth history, even the original fundamentalists accepted that the opening book of the Bible could not wholly explain the past. Later, in waging war on evolution, reactionary evangelicals resurrected discredited seventeenth-century ideas to explain topography, rock formations, and earth history—invoking a mysterious vapor canopy that they held fell from the sky to trigger Noah's Flood. The displays at the Creation Museum in Peterson, Kentucky, USA, explicitly reject reason, branding it the enemy of faith and invoking a centuries-long, ongoing conspiracy of scientists to mislead the faithful about the nature of the world. Despite centuries of geological research that contradicts creationist claims, Gallup tracking polls from 1982 to 2012 have consistently found that more than 40% of Americans believe that God created people fewer than 10,000 years ago (Gallup, 2012).

While struggles over the geological implications of biblical interpretations date back to the earliest days of the Church, the

story of how naturalists wrestled over reconciling the biblical flood with a growing body of contradictory geological evidence shows that the twentieth-century revival of flood geology recycled ideas previously abandoned in the face of compelling evidence. In light of nineteenth-century scientific discoveries, it appeared reasonable to read the biblical account of the Flood as either allegorical or a story told from the perspective that the whole world appeared flooded from the ark. Time and again, Christians accommodated geologic findings by reinterpreting Genesis to preserve the integrity of both natural and scriptural truths.

Of course, there were significant holes in conventional geological theories when Whitcomb and Morris laid out their biblically inspired views on earth history. Plate tectonics did not yet provide an explanation for the origin and distribution of mountains and other geological problems, such as the presence of fossils of temperate and tropical creatures entombed in rocks at high latitudes. But when the plate tectonics revolution swept through the earth sciences and explained previously perplexing observations, creationists ignored what they considered yet another misguided geological theory.

While geological thought has evolved over the past several centuries, Christianity has too—to the point where several varieties of creationists now argue bitterly amongst themselves. Young-Earth creationists believe the world is fewer than 10,000 years old and that Noah's Flood remodeled it into the topography we know today in one fell swoop a few thousand years ago. Old-Earth creationists accept geological evidence and endorse ideas such as the gap or day-age theories and progressive creationism (also known as theistic evolution), through which God guided evolution in creating the diversity of life. The latest step in the evolution of creationism is based on repackaging as intelligent design the inherently untestable assertion that God designed the world with a particular purpose or goal in mind. Today, after losing repeated court battles over efforts to teach creationist views in science classrooms, the creationist strategy appears to have shifted to promoting efforts to question evolution.

Generally left out of the resulting “debates” is the simple fact that creationists lack any independently supported geological evidence to support their views. The late Harvard paleontologist Stephen J. Gould described a global flood as “the only specific and testable theory the creationists have offered,” noting that “the claim that creationism is a science rests above all on the plausibility of the biblical flood” (Gould, 1982, p. 12, 10). And yet, the geological case for a global flood that creationists offer as an alternative to evolution was discredited before Darwin set foot aboard *The Beagle*.

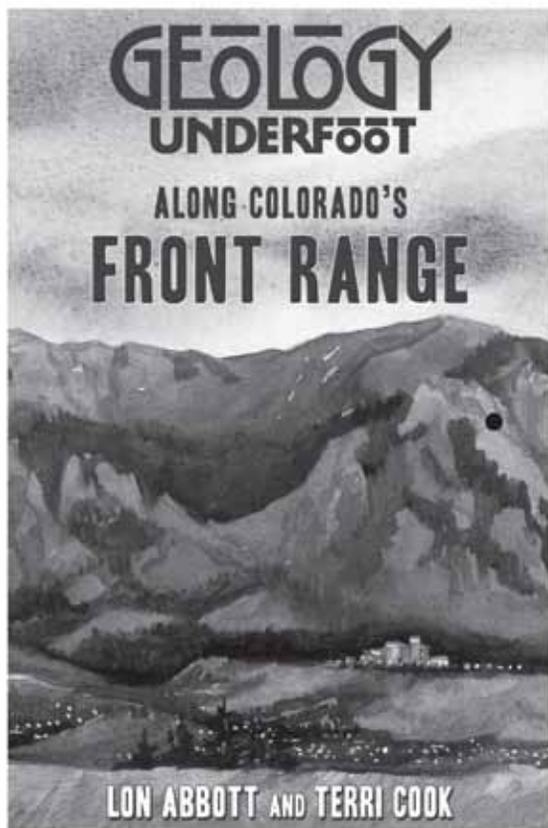
Geologists assess theories by how well they fit data, and creationists evaluate facts by how well they fit their theories. This simple distinction frames an unbridgeable intellectual rift. Nowhere is this divide deeper than over how to interpret the story of Noah's Flood, for the ideas invoked to explain such an event have been refuted time and again, and there is no geologic evidence of a global deluge. Following Whitcomb and Morris, today's creationists continue to pick and choose evidence to support beliefs their faith inspires. Given the ongoing conflict over what to teach in science classrooms, perhaps teaching the historical evolution of creationism offers a fresh way for students to learn about the history of geology, and thereby our knowledge of the world and how it works.

How many creationists today know that modern creationism arose from abandoning faith that the study of nature would reveal God's grand design for the world?

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2012–2013 Richard H. Jahns Distinguished Lecturer



James P. McCalpin has been named the 2012–2013 Richard H. Jahns Distinguished Lecturer in Engineering Geology. McCalpin is president of GEOHAZ Consulting and director of the Crestone Science Center. He specializes in geologic hazards, paleoseismology, applied geomorphology, Quaternary geology, and international outreach. In 22 years of consulting, McCalpin has analyzed geologic hazards in 37 countries, for projects ranging from power plants (conventional and nuclear) to waste repositories, dams and hydropower sites, mines, pipelines, ski areas, urban geohazard studies, and residential developments.

McCalpin received his B.A. from The University of Texas, an M.S. from the University of Colorado, and a Ph.D. from the Colorado School of Mines. In his 40-year career, he has worked for government agencies (USGS; Jefferson County, Colorado), taught in academia (Utah State University), and has been a full-time consultant since 1990. McCalpin has authored or co-authored more than 100 articles and 100 technical consulting reports, as well as 13 published geologic maps, and 18 books or monographs. His diverse research topics include paleoseismology, GIS earthquake hazard mapping, seismic hazard analysis, landslide inventory mapping, slope stability studies, sacking and other nonseismic surface deformation, LiDAR geomorphology, and finding new applications of exploratory trenching.

McCalpin's accolades include the 2000 GSA Environmental and Engineering Geology Division E.B. Burwell, Jr., Award and the 1999 Holdredge Award of the Association of Engineering Geologists.

The main talk being offered by McCalpin is "The mountains are falling

apart: A spectrum of mass failures from landslides through deep-seated gravitational spreading (sacking), to 'unfolding' of folds."

Other talks on the following topics can also be arranged: "Paleoseismology: Has it reduced seismic hazards, and if not, how do we change course?"; "The many uses of trenching in assessing geologic hazards in engineering geology"; "Ski areas and their slope stability problems: The Colorado Story"; and "LiDAR reveals the bare earth: LiDAR geomorphology and its applications to engineering geology." All talks are suitable for technical/professional and general audiences.

To make arrangements for talks, please contact James McCalpin directly at mccalpin@geohaz.com or +1-719-256-5227. Descriptions of these talks are posted on the AEG website (www.aegweb.org) and the GSA Environmental and Engineering Geology website (<http://rock.geosociety.org/egd/>).

GSA International Distinguished Lecture Tour

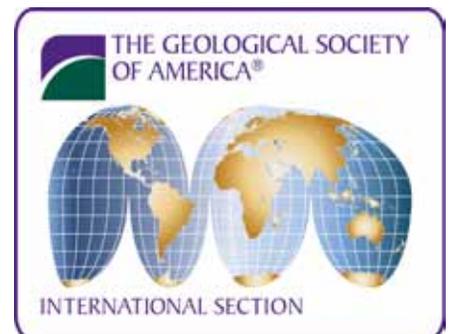


Victor R. Baker

NOVEMBER TOUR DATES

GSA seeks to be a leader in promoting programs that actively involve the global science community and therefore is proud to announce the inaugural International Distinguished Lecture Tour, arranged under the auspices of the GSA International Section. The 2012 GSA Distinguished International Lecturer is **Victor R. Baker**, who will lecture on the topics "Megafloods on Earth, Mars, and beyond" and "Geological history of water on an Earth-like planet" during his tour through Italy, France, Germany, and Israel in November. For lecture dates and locations, check the International Section website: www.geosociety.org/Sections/International/LectureTour.htm.

Gullies with Characteristics of Water-Carved Channels. False-color image of gully channels in a crater in the southern highlands of Mars, taken by the High Resolution Imaging Science Experiment (HiRISE) camera on the Mars Reconnaissance Orbiter. The gullies emanating from the rocky cliffs near the crater's rim (upper left) show meandering and braided patterns typical of water-carved channels. North is approximately up and illumination is from the left. Credit: NASA/JPL/University of Arizona.



2012–2013 Birdsall-Dreiss Distinguished Lecturer



Dani Or is professor of Soil and Terrestrial Environmental Physics and Director of the Institute of Terrestrial Ecosystems (ITES) in the Dept. of Environmental Systems Science at the Swiss Federal Institute of Technology (ETH) Zurich in Switzerland. His research focuses on mass and energy transport in porous media, mechanics of abrupt landslides and avalanches, and linking physical processes and biological activity in soils. Or has authored over 170 refereed publications, co-authored a book, and authored or co-authored more than 270 proceeding papers and abstracts. He is Editor in Chief of the *Vadose Zone Journal*, recipient of the Kirkham Soil Physics Award (2001), 2004 Fellow of the Soil Science Society of America, chair of the 2008 Gordon Research Conference on Flow and Transport (Oxford, UK), and 2010 Fellow of the American Geophysical Union. His 2013 Birdsall-Dreiss lectures will be based on recent work linking porous media properties and evaporation dynamics from terrestrial surfaces, and on micro-hydrology and biophysical processes controlling microbial life in the subsurface.

Interested institutions should contact Dani Or at dani.or@env.ethz.ch to schedule a lecture on one of the following topics:

1. **How do porous terrestrial surfaces control evaporation into the atmosphere?** Abstract: Globally, evaporation consumes ~25% of solar energy input and is a key hydrologic driver with ~60% of terrestrial precipitation returning to the atmosphere via evapotranspiration. Quantifying evaporation is important for assessing changes in hydrologic reservoirs and surface energy balance, and for many industrial and engineering applications. Key (1972) commented that “evaporation is a commonly practiced art, but a neglected science.” In general, dynamic interactions of evaporating surfaces with internal transport mechanisms and with environmental conditions remain largely empirical. Evaporation dynamics from porous media is significantly different than from free water surfaces due to withdrawal of liquid from internal pore spaces and nonlinear interactions between drying surfaces across air boundary layers. Porous media properties determine abrupt transition from initially high (and relatively constant) evaporation rate (stage 1) to a slower diffusion-controlled stage 2. This well-documented behavior is attributed to disruption of capillary liquid continuity essential for supplying surface evaporation. Evaporation rate is a highly nonlinear function of surface water content. This nonlinear behavior is attributed to enhanced vapor fluxes from active pores as a

surface dries and remaining pores become increasingly isolated. Increased spacing between evaporating pores under low atmospheric demand (thick boundary layer) significantly increases evaporative flux per pore that, in turn, may fully compensate for reduced evaporative surface area to sustain a constant evaporation rate. Implications of the findings for estimates of evaporative losses used in hydrological and climate models will be discussed.

2. **Biophysical processes shaping bacterial life in soils—An unexplored universe under our feet.** Abstract: By some accounts, exploring the microbial diversity found in soils represents an uncharted scientific frontier at a scope similar to that of space exploration. The immense diversity of soil microbial life is attributed to the complex and heterogeneous pore surfaces and spaces with highly dynamic aqueous and chemical microenvironments. In most unsaturated soils, a flickering aqueous network defines nutrient diffusional pathways and shapes microbial dispersion patterns. We quantitatively explored effects of microscale hydration on biophysical interactions affecting microbial dispersion and controlling coexistence of competing bacterial species inhabiting unsaturated surfaces. The rapid fragmentation of the aqueous phase yields a surprisingly narrow range of hydration-enabled motility, and marks the onset of flux limiting and heterogeneous diffusion fields that promote coexistence. Conditions promoting coexistence occur under mild unsaturated conditions within matric potential values of a few kPa nearly independent of soil or rock type. The spontaneous spatial organization of interacting microbial populations and formation of consortia shaped by dynamic diffusion fields and trophic interactions offers a fascinating and robust level of self-organization that supports high diversity found in soil. The resulting length scales for interactions offer new insights into biogeochemical function of soil microbes and could guide bioremediation activities of the subsurface.



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GSA Awards & Grants Deadline:

1 February 2013



The nomination/application deadline for the following awards and honors is **1 Feb. 2013**. For details, see the October *GSA Today* or go to www.geosociety.org/awards/.

Information and nomination forms can also be obtained from GSA Grants, Awards & Recognition, P.O. Box 9140, 3300 Penrose Place, Boulder, CO 80301-9140, USA, +1-303-357-1028, awards@geosociety.org.

2013 GSA MEDALS AND AWARDS

- Penrose Medal
- Day Medal
- Young Scientist Award (Donath Medal)
- GSA Public Service Award
- The Bromery Award for the Minorities
- GSA Distinguished Service Award
- Subaru Outstanding Woman in Science Award

GSA FELLOWSHIP

A GSA member can be elected to Fellowship in recognition of distinguished contributions to the geosciences. Current GSA Fellows may support two nominees each year (only one as a primary nominator), and GSA members (not Fellows) may be secondary nominators for up to two nominees.

AGI MEDAL IN MEMORY OF IAN CAMPBELL

The AGI Medal in Memory of Ian Campbell recognizes singular performance in and contribution to the profession of geology. Submit your nomination at www.agiweb.org/direct/awards.html.

AGI MARCUS MILLING LEGENDARY GEOSCIENTIST MEDAL

The Marcus Milling Legendary Geoscientist Medal is awarded for consistent contributions of high-quality scientific achievements and service to the earth sciences that are of lasting historic value. The awardee will have been recognized for accomplishments in his or her field of expertise by professional societies, universities, or other organizations, and should be a senior scientist nearing completion of or having completed full-time regular employment. Submit your nomination at www.agiweb.org/direct/awards.html.

2013 NATIONAL AWARDS

- **William T. Pecora Award:** <http://remotesensing.usgs.gov/pecora.php>.
- **National Medal of Science:** www.nsf.gov/od/nms/medal.jsp.
- **Vannevar Bush Award:** www.nsf.gov/nsb/awards/bush.jsp.
- **Alan T. Waterman Award:** www.nsf.gov/od/waterman/waterman.jsp.
- **G.K. Warren Prize:** www.nasonline.org/site/PageServer?pagename=AWARDS_warren.

2013 GRADUATE STUDENT RESEARCH GRANTS

GSA is proud to offer research grants to its highly qualified student members.

NEW: Students may receive a total of two grants during their academic career, regardless of the program in which they are currently enrolled (i.e., Master's or Ph.D.). **The maximum award per grant is US\$2,500.**

The GSA student research grant application is online only at www.geosociety.org/grants/gradgrants.htm; no paper applications or letters of support will be accepted. The application process will open in late November 2012; submissions must be completed by Friday, 1 Feb. 2013, at 11:59 p.m. MST.

If you need information on the 2013 Research Grant Program that cannot be found online, please call +1-303-357-1028 or e-mail awards@geosociety.org.

2013 POST-DOCTORAL RESEARCH AWARDS

The following post-doc research awards are managed by the GSA Foundation. Learn more at www.geosociety.org/grants/postdoc.htm.

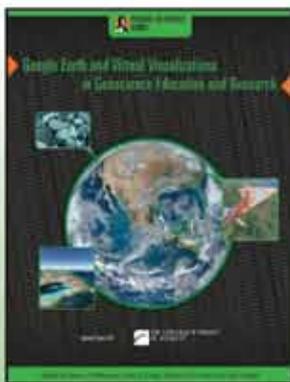
- The **Gladys W. Cole Memorial Research Award** for research on the geomorphology of semiarid and arid terrains in the United States and Mexico is awarded to a GSA member or Fellow between 30 and 65 years of age who has published one or more significant papers on geomorphology.
- The **W. Storrs Cole Memorial Research Award** for research on invertebrate micropaleontology is awarded to a GSA member or Fellow between 30 and 65 years of age who has published one or more significant papers on micropaleontology.

John C. Frye Environmental Geology Award

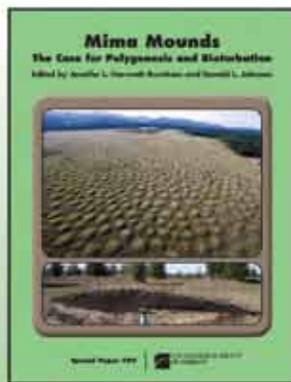
Nomination deadline: 31 March 2013

In cooperation with the Association of American State Geologists and supported by endowment income from the GSA Foundation's John C. Frye Memorial Fund, GSA makes an annual award for the best paper on environmental geology published either by GSA or by a state geological survey.

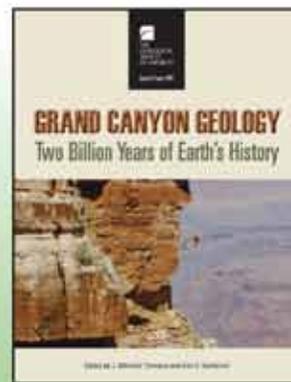
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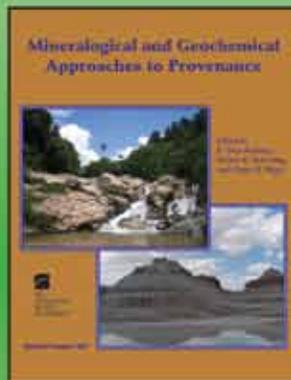
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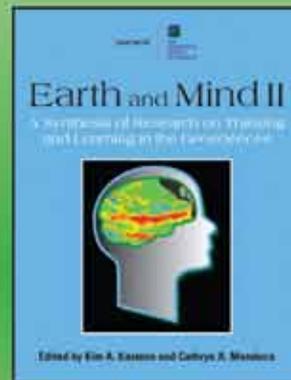
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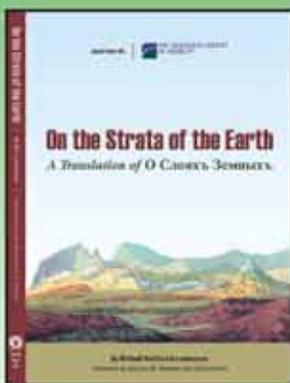
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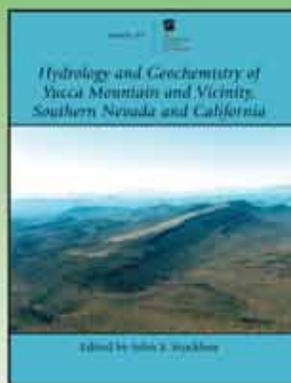
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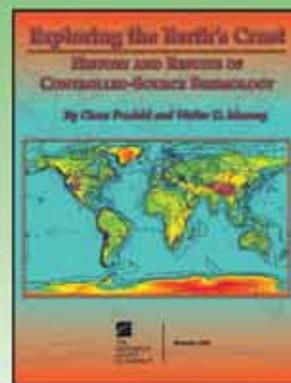
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Annual meeting session proposals are now being accepted.
Help shape the 2013 Annual Meeting and be a part of the 125th Anniversary!

2013 Field Trips

Proposals due **3 Dec. 2012**

Any GSA member can propose a field trip; use this opportunity to teach your colleagues and peers about the breathtaking geology of the Denver, Colorado, USA, region. Trips can be anywhere from a half day to 5 days long. Questions? Contact Beth Engle, +1-303-357-1006, bengle@geosociety.org.

2013 Technical Sessions

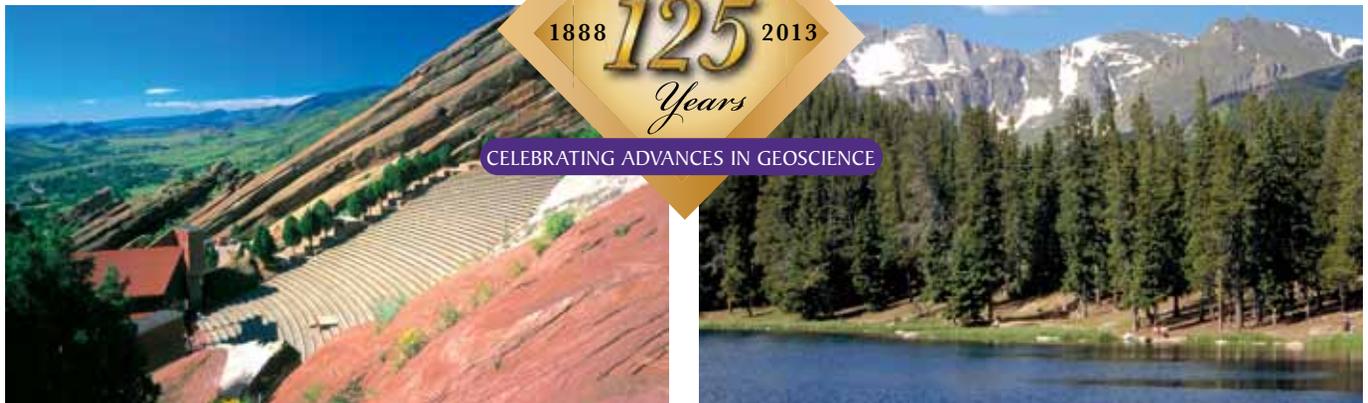
Proposals due **8 Jan. 2013**

Share your knowledge, experience, and research, and draw from a myriad of geoscience experts by submitting a technical session proposal. Help mold what is sure to be a dynamic technical program at next year's 125th Anniversary Meeting in Denver.

2013 Short Courses

Proposals due **1 Feb. 2013**

Short courses make a great start to the annual meeting. Offer a short course to help your colleagues, peers, students, and K–12 teachers develop professional, teaching, and research skills at all levels, and be a part of the action. Questions? Contact Jennifer Nocerino, jnocerino@geosociety.org.



Red Rocks Amphitheatre. Photo by Ron Ruhoff. Photo courtesy Denver Metro Convention & Visitors Bureau.

Echo Lake with Mount Evans in the background. Photo by Richard Grant, courtesy Denver Metro Convention & Visitors Bureau.

www.geosociety.org/meetings/2013/

GSA's specialty Divisions help you stay connected with your colleagues worldwide and receive specific information related to your area of interest. Divisions provide opportunities for leadership and service, specialty meetings, awards and student support, and development of the GSA meeting technical program.

- **ARCHAEOLOGICAL GEOLOGY** (est. 1977; 527 members) provides a forum for the presentation and discussion of papers on archaeological geology in order to stimulate and promote research and teaching within this field. Division awards include the *Rip Rapp Archaeological Geology Award*, the *Richard Hay Student Paper/Poster Award*, and the *Claude C. Albritton, Jr., Award* memorial fund.
- **COAL GEOLOGY** (est. 1954; 247 members) encourages coal research and disseminates information about coal geology to all interested parties by actively participating in thought-provoking symposia and technical sessions at GSA's meetings and through scientifically pertinent publications. The Division sponsors a major award for outstanding contributions to the field of coal geology, the *Gilbert H. Cady Award*, and also recognizes the volunteered contributions of its members through its *Distinguished Service Award*. For students, the Division offers the *Antoinette Lierman Medlin Scholarship*, the *Antoinette Lierman Medlin Laboratory and Field Awards* and a *Best Student Paper Award*.
- **ENVIRONMENTAL & ENGINEERING GEOLOGY** (est. 1947; 1,147 members) seeks to advance the ability of geologists to identify, characterize, and mitigate adverse geological and environmental conditions and hazards affecting human safety and the built environment. To do so, the Division promotes research, education, and dissemination of information relevant to members. Each year, the Division honors an outstanding recent publication with the *E.B. Burwell, Jr., Award* and, along with the Assoc. of Environmental and Engineering Geologists, commissions the *Richard H. Jahns Distinguished Lecturer*. Other Division awards include the *Meritorious Service Award*, the *Distinguished Practice Award*, and, for students, the *Roy J. Shlemon Scholarship Awards*.
- **GEOBIOLOGY & GEOMICROBIOLOGY** (est. 2001; 308 members) promotes interdisciplinary research focusing on the interplay between the biosphere, lithosphere, hydrosphere, and atmosphere. More specifically, geobiologists and geomicrobiologists examine the effects of biological activities on geological processes and the influences of geological settings on biological processes—both at the macro- and micro-biological scales and in the past through the present. Members are invited to the yearly lunch banquet where winners of the annual *Outstanding Contributions to Geobiology & Geomicrobiology Awards* are celebrated.
- **GEOINFORMATICS** (est. 2006; 220 members) advances “Data to Knowledge,” providing GSA members with an opportunity to participate in the emerging field of cyberinfrastructure. The Division actively promotes and sponsors short courses, symposia, and books that emphasize information technology-supported discovery and integration of geoscience data leading to a more comprehensive understanding of Earth and the planets as complex systems. Each year, the Division presents the *Outstanding Contributions in Geoinformatics Award*.
- **GEOLOGY AND HEALTH** (est. 2005; 195 members) focuses on the intersection of natural or anthropogenic geological conditions with health, disease, pathology, and death in modern and fossil humans, animals, and plants. This Division fosters communication and collaboration among scientists and health practitioners with an emphasis on the interdisciplinary relationship of geology to medicine, biology, chemistry, and other sciences. Division awards include the *Meritorious Service Award*, the *Distinguished Service Award*, and—to students—the *Best Publication Award*.
- **GEOLOGY & SOCIETY** (est. 2003; 307 members) advances the concept of “geology working for society” by providing GSA members with opportunities to bring together multiple fields of geoscience to address important societal issues. This division actively hosts interdisciplinary symposia at national and regional meetings, provides forums to help its members effectively communicate with decision makers and the public, encourages student achievement in helping to inform public policy by sponsoring a *Best Student Presentation Award* at the national meeting, and honors professional achievement in enhancing public policy by presenting a *Distinguished Lecture* at the annual meeting. The Division also works closely with the Geology and Public Policy Committee to develop and distribute GSA position statements.
- **GEOPHYSICS** (est. 1971; 525 members) facilitates the presentation and discussion of the ideas of scientists interested in geophysics, fosters communication among geophysicists and other earth scientists, and promotes research and publication. This Division sponsors the *George P. Woollard Award* and lecture for outstanding contributions to geology through the application of the principles and techniques of geophysics. For students, the Division offers the *Allan V. Cox Student Research Award* and the *GSA Geophysics Division Student Research Award*.
- **GEOSCIENCE EDUCATION** (est. 1991; 1,044 members) fosters the active participation of GSA members in all aspects of earth-science education. The Division complements and expands on the contributions of GSA's Education & Outreach group, the National Earth Science Teachers Association (NESTA), the National Association of Geology Teachers (NAGT), the National Science Teachers Association (NSTA), and other similar organizations. It sponsors the *Biggs Earth Science Teaching Award* and a *Distinguished Service Award*.

- **HISTORY AND PHILOSOPHY OF GEOLOGY** (est. 1976; 326 members) works to encourage the study and communication of the philosophy and history of geology. The Division sponsors technical sessions at GSA meetings and honors geologists for their research, writing, and historical work through the *Mary C. Rabbitt History of Geology Award*, the *Gerald M. and Sue T. Friedman Distinguished Service Award*, and the *History & Philosophy of Geology Student Award*.
- **HYDROGEOLOGY** (est. 1959; 1,377 members) focuses on the geologic aspects of hydrogeology, the role of geology in the hydrologic cycle, and the importance of hydrogeology to society and science. The Division has a well-established mentor program (John Mann Mentors in Applied Hydrogeology) for students looking at careers in this field. The *Birdsall-Dreiss Distinguished Lecturer* honorees are named by this Division, along with the *O.E. Meinzer Award*, the *George Burke Maxey Distinguished Service Award*, the *Kohout Early Career Award*, and the *Hydrogeology Division Student Research Grant Awards*.
- **LIMNOGEOLOGY** (est. 2002; 216 members) encourages research on both ancient and modern lakes around the world, the collaboration of scientists from all disciplines on lake research, and the fostering of student research and careers in lake studies. The Division sponsors the *Israel C. Russell Award* and the *Kerry Kelts Student Research Award*.
- **MINERALOGY, GEOCHEMISTRY, PETROLOGY, AND VOLCANOLOGY** (est. 2009; 1,432 members) promotes awareness, teaching, and research in these fields, and stimulates discussion about the knowledge, ideas, research results, and problems regarding these fundamental areas of the earth sciences. Annually, the Division sponsors a *Distinguished Geologic Career Award* and two student research grant awards.
- **PLANETARY GEOLOGY** (est. 1981; 670 members) fosters interactions among planetary scientists, facilitates the presentation and discussion of their research and ideas, stimulates communication with other earth scientists, and promotes planetary geology to a broad audience. Awards sponsored by the Division include the *G.K. Gilbert Award*, the *Ronald Greeley Award for Distinguished Service*, and, for students, the *Eugene M. Shoemaker Impact Cratering Award*, the *Stephen E. Dwornik Awards* for best student presentations at the annual Lunar and Planetary Science Conference, *Student Travel Grants*, and (jointly with the Meteoritical Society) the *Pellas-Ryder Award* for the best student-authored paper in planetary science.
- **QUATERNARY GEOLOGY AND GEOMORPHOLOGY** (est. 1955; 1,426 members) facilitates communication among scientists in these fields and the presentation of their research and ideas to the wider scientific community. Several awards are given by this Division, including the *Distinguished Career Award*, the *Kirk Bryan Award*, the *Gladys W. Cole Memorial Award*, the *Farouk El-Baz Award for Desert Research*, and the *J. Hoover Mackin*, *Arthur D. Howard*, and *Marie Morisawa* student research awards.
- **SEDIMENTARY GEOLOGY** (est. 1985; 1,216 members) works to ensure the presentation of sedimentary-related topics and sessions at GSA meetings and actively nurtures the work of students by offering the *Sedimentary Geology Division Student Research Grant Award* and *Student Poster Awards* and by providing financial aid for students to attend Division-sponsored short courses and field trips. It also offers the *Laurence L. Sloss Award* for outstanding accomplishments in sedimentary geology and contributions to GSA and cosponsors the *Stephen E. Laubach Research in Structural Diagenesis Award* (alternating with the Structural Geology and Tectonics Division).
- **STRUCTURAL GEOLOGY AND TECTONICS** (est. 1980; 1,726 members) focuses on the geometry and mechanisms of natural and experimental deformation at all scales and works to promote the research of scientists in these fields and to facilitate communication and discussion at all levels of the earth sciences. The Division offers a *Career Contribution Award* for advancement of the science of structural geology and tectonics, an *Outstanding Publication Award*, and a *Division Student Research Grant Award*. It also cosponsors the *Stephen E. Laubach Research in Structural Diagenesis Award* (alternating with the Sedimentary Geology Division).

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NORTH-CENTRAL

47th Annual Meeting of the North-Central
Section, GSA

Kalamazoo, Michigan, USA

2–3 May 2013

www.geosociety.org/Sections/nc/2013mtg/



The Great Lakes of North America, April 2005. Image Credit: Jeff Schmaltz; courtesy NASA.

LOCATION

The 47th Annual Meeting of GSA's North Central Section will take place on the campus of Western Michigan University in Kalamazoo, Michigan, USA. Easily accessible by interstate highway, bus, and plane, Kalamazoo is a vibrant small city with a relaxed atmosphere and a variety of restaurants, microbreweries, and cultural attractions. The meeting venue is the Fetzer Center, the university's conference center.

CALL FOR PAPERS

Abstract deadline: 5 February 2013

Please submit your abstract online at www.geosociety.org/sections/nc/2013mtg/. An abstract submission fee of US\$10 for students and US\$15 for all others will be charged. If you cannot submit an abstract online, please contact Nancy Wright, +1-303-357-1061, nwright@geosociety.org. Theme Sessions are listed as follows; we also welcome abstract submission to discipline sessions.

THEME SESSIONS

T1. **Advances in Glacial Sediment Characterization: Implications for Groundwater Flow and Contaminant Transport Modeling.** Larry Lemke, Wayne State Univ., ldlemke@wayne.edu; Remke Van Dam, Michigan State Univ., rvd@msu.edu.

- T2. **Applications of Near-Surface Geophysics.** Bill Sauck, Western Michigan Univ., sauck@wmich.edu; Remke Van Dam, Michigan State Univ., rvd@msu.edu.
- T3. **Applications of Stable Isotopes to Environmental Problems.** Eliot Atekwana, Oklahoma State Univ., eliot.atekwana@okstate.edu; R.V. Krishnamurthy, Western Michigan Univ., r.v.krishnamurthy@wmich.edu.
- T4. **Quaternary Research in the Great Lakes Region I: The Pleistocene.** Randy Schaetzl, Michigan State Univ., soils@msu.edu; Catherine Yansa, Michigan State Univ., yansa@msu.edu.
- T5. **Quaternary Research in the Great Lakes Region II: The Holocene.** Catherine Yansa, Michigan State Univ., yansa@msu.edu; Randy Schaetzl, Michigan State Univ., soils@msu.edu.
- T6. **Quaternary Time Machine: Methods and Analyses of Soils and Sediments to Reveal Secrets of Past Environments.** M. Kathryn Rocheford, Univ. of Iowa, kat-rocheford@uiowa.edu; Maija Sipola, Univ. of Iowa, maija-sipola@uiowa.edu.
- T7. **Cultural Geology: Heritage Stone, Buildings, Parks, Exhibits, and More.** Nelson Shaffer, Indiana Geological Survey, shaffern@indiana.edu; Joe Hannibal, Cleveland Museum of Natural History, jhanniba@cmnh.org.
- T8. **Addressing Environmental Aspects of Geology: Research, Pedagogy, and Public Policy.** Mike Phillips, Illinois Valley Community College, mike_phillips_ivcc.edu.
- T9. **Sources, Transport, and Fate of Trace Elements and Organics in the Environment.** Ryan Vannier, Michigan State Univ., vannierr@msu.edu; Colleen McLean, Youngstown State Univ., cemclean@ysu.edu.
- T10. **Mapping the Glacial Geology of the Great Lakes States.** Kevin Kincare, U.S. Geological Survey, kkincare@usgs.gov; Dick Berg, Illinois State Geological Survey, berg@isgs.illinois.edu.
- T11. **Working With Pre-Service Teachers—Issues and Ideas.** Kyle Gray, Univ. of Northern Iowa, kyle.gray@uni.edu; Anthony Feig, Central Michigan Univ., anthony.feig@cmich.edu.
- T12. **Research in Earth Science Education.** Heather Petcovic, Western Michigan Univ., heather.petcovic@wmich.edu; Sandra Rutherford, Univ. of Wisconsin, srutherford@wisc.edu.
- T13. **Innovative Earth Science Teacher Professional Development.** Mark Klawiter, Michigan Technological Univ., mfklawit@mtu.edu; Carol Engelmann.
- T14. **Teaching and Learning Earth Science: K–16 Educational Pedagogy.** Katie Johnson, Eastern Illinois Univ., kjohnson4@eiu.edu; Stephen Mattox, Grand Valley State Univ., mattox@gvsu.edu.
- T15. **Paleontology as a Murder Mystery: How the Study of Predation and Taphonomy Reveals the Means, Motives & Opportunities of Ancient Perpetrators and Their Victims.** Karen Koy, Missouri Western Univ., kkoy@missouriwestern.edu; Joseph E. Peterson, Univ. of Wisconsin–Oshkosh, petersoj@uwosh.edu.
- T16. **Paleozoic Vertebrates: Evolution, Paleocology, Systematics, and Assemblages.** Chuck Ciampaglio, Wright State Univ., chuck.ciampaglio@wright.edu.
- T17. **Special Poster Session on Undergraduate Research.** Ed Hansen, Hope College, hansen@hope.edu; Robert Schuster, Univ. of Nebraska, rshuster@unomaha.edu.

T18. **Recent Advances in Exploration and Evaluation of Economic Mineral Deposits in the Upper Midwestern United States.** Joyashish Thakurta, Western Michigan Univ., joyashish.thakurta@wmich.edu

WORKSHOP

The Carboniferous of the Michigan Basin: Mississippian (Osagean) Marshall through the Pennsylvanian (Morrowan-Atokan) Saginaw Formations. Shannon Towne, Michigan Geological Survey/Geosciences, Western Michigan Univ., shannon.m.towne@wmich.edu; Dave Barnes, Michigan Geological Survey/Geosciences, Western Michigan Univ., dave.barnes@wmich.edu; William B. Harrison III, Michigan Geological Repository for Research and Education, harrison@wmich.edu

FIELD TRIPS

1. **Kentland Quarry & Kentland, Indiana Impact Structure.** John Weber, Grand Valley State Univ., weberj@gvsu.edu.
2. **The Detroit Salt Mine.** Trip leader: William B. Harrison III, Director, Michigan Geological Repository for Research and Education (MGREE), harrison@wmich.edu; on-site leader: E.Z. Manos, President, Detroit Salt Mine Company.
3. **Contrasting Terrains of the Lake Michigan and Saginaw Lobes in Southern Michigan.** Alan Kehew, Western Michigan Univ., alan.kehew@wmich.edu; Andrew Koslowski, New York State Museum—Albany, akoslows@mail.nysed.gov; Brian Bird, New York State Museum, bbird@nysed.gov; John Esch, Michigan Dept. of Environmental Quality, eschj@michigan.gov.

4. **Pennsylvanian Fluvial-Deltaic Depositional Systems in Central Lower Michigan: Sedimentology, Stratigraphy, and Hydrogeology of the Saginaw Aquifer.** Niah Venable; David Barnes, Michigan Geological Survey/Geosciences, Western Michigan Univ., dave.barnes@wmich.edu; Dave Westjohn; Amanda Walega.
5. **Michigan Sand Dunes.** Edward Hansen, Hope Collage, hansen@hope.edu.
6. **Geology and Slope Stability along the Lake Michigan Coastal Zone.** Ronald Chase, Western Michigan Univ., ronald.chase@wmich.edu.

ACCOMODATIONS

Blocks of rooms have been reserved at the Holiday Inn Kalamazoo West, 2747 S. 11th Street, Kalamazoo, Michigan 49009, USA; +1-269-484-4950 (US\$99 + tax), and also at the Red Roof Inn Kalamazoo West, 5424 W. Michigan Ave., Kalamazoo, Michigan 49009, USA; +1-269-375-7400 (US\$64.99 + tax).

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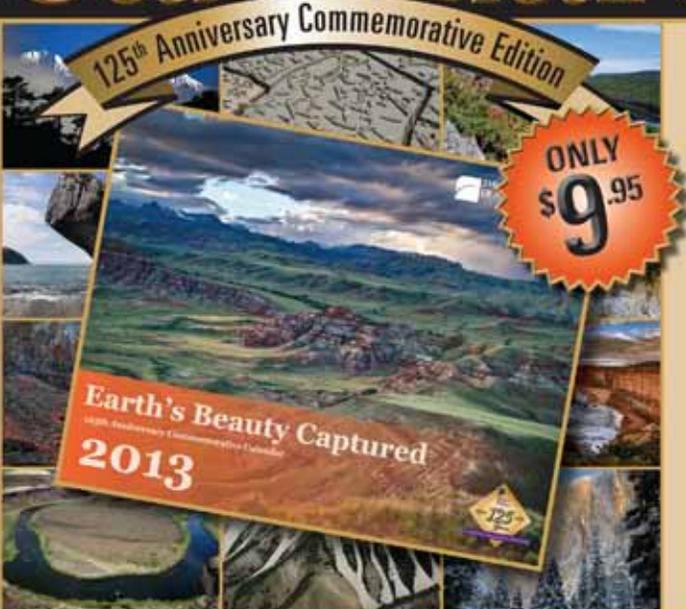
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- Dates of many noteworthy eruptions and earthquakes
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Andrew Gerwitz, BLM, Grand Staircase–Escalante National Monument.

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Bureau of Land Management

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Tyra Olstad, NPS, Denali National Park and Preserve.

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 Rogue Siskiyou National Forest, **Kelly Coker**
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 Craters of the Moon National Monument and Preserve,
Emily Carbone
 Craters of the Moon National Monument and Preserve,
Rebecca Garcia
 Death Valley National Park, **Meagan Thibodaux**
 Delaware Water Gap National Recreation Area, **Alexander Colon**
GeoCorps participants continued on p. 22

GeoCorps participants continued from p. 21

Denali National Park and Preserve, **Lucy Chang**
Denali National Park and Preserve, **Susan Jagoda**
Denali National Park and Preserve, **Lisa Merkhofer**
Denali National Park and Preserve, **Tyra Olstad**
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Dinosaur National Monument, **David Tarailo**
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John Day Fossil Beds National Monument, **Meghan McKnight**
John Day Fossil Beds National Monument, **Justin Williamson**
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Mammoth Cave National Park, **Gregory Connock**
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Shenandoah National Park, **Peter Bonsall**
Upper Delaware Scenic and Recreational River, **Gus Frederick**
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White Sands National Monument, **Leiloni Begaye**
White Sands National Monument, **Sahrah Bliss**
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Positions for spring/summer 2013
will be posted 1 December 2012.

Positions for fall/winter 2013
will be posted 1 May 2013.

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Briana Jasinski and Jennifer Kolm, Medicine Bow National Forest, Wyoming, and Arapaho-Roosevelt National Forest, Colorado, USA.



Jennifer Kurashige, NPS, Glen Canyon National Recreation Area.

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P. Geoffrey Feiss, GSA Foundation President

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We will welcome two new trustees at the Annual Meeting in Charlotte:



Darrel Cowan is professor of earth & space sciences in the College of the Environment at the University of Washington. As a field-oriented structural geologist, he and his students have investigated field areas in the North American Cordillera, Alaska, Japan, Croatia, the northern Apennines in Italy, and more

recently, Sicily. He has focused much of his work on regional tectonic problems, how ancient chaotic mélanges and olistostromes are related to accretionary processes at convergent plate margins, and on the origin of fault rocks in shallow crustal brittle faults and shear zones. Cowan received his B.S. and Ph.D. in geology from Stanford University. He began his professional career as a geologist in the Alaska Division of Shell Oil Company. Since 1974, he has been on the faculty in the University of Washington, serving as chair of the former Dept. of Geological Sciences from 1989 to 1994 and as acting chair in 2000–2001. While acting chair, he facilitated the creation of the new Dept. of Earth & Space Sciences. Cowan is a GSA Fellow and served as a GSA Councilor in 2004–2008, as well as chair of the Structural Geology & Tectonics Division and the Cordilleran Section. He was General Chair for the 1994 Annual Meeting in Seattle.



Lisa Pratt is Provost Professor and chair of the Dept. of Geological Sciences at Indiana University. She studies microbial cycling of carbon and sulfur in the deep-subsurface groundwater and in permafrost settings on Earth as an analogue for habitable environments on Mars. Pratt served as chair of a NASA

Science Advisory Group from 2008 to 2010 that proposed a mission titled “Mars Astrobiology Explorer-Cacher (MAX-C)” as the first step in drilling and caching rock cores that could be returned to Earth and examined for evidence of fossil life. She was a member of the Mars Panel for the National Research Council Planetary Science Decadal Survey and she is currently a member of the Mars Program Planning Group for NASA. During the summer of 2012, she directed an engineering and science campaign in western Greenland to install gas-sampling devices in bedrock boreholes for long-term monitoring of methane fluxes from fracture zones in the Arctic. Pratt received her B.S. (botany) and M.S. (geology) from the University of North Carolina at Chapel Hill, an M.S. (botany) from the University of Illinois, and her Ph.D. in geology from Princeton University. She held an NRC postdoctoral fellowship and then was a research geologist with the USGS before joining the faculty at IU. She has served as associate dean for research at IU. Lisa is a GSA Fellow and has been an AAPG distinguished lecturer and a Phi Beta Kappa Visiting Scholar. She has also been a plenary speaker at the National Science Teachers Association Annual Meeting.

If you would like to make a contribution to the Foundation, please go to www.gsafweb.org/makeadonation.html or contact Anna Christensen, Chief Development Officer, GSA Foundation, +1-303-357-1007, achristensen@geosociety.org.

2013 GSA Section Meeting Calendar

Northeastern 18–20 March 2013

Bretton Woods, New Hampshire, USA
Abstracts deadline: 11 December 2012

Southeastern 20–21 March 2013

San Juan, Puerto Rico
Abstracts deadline: 11 December 2012

South-Central 4–5 April 2013

Austin, Texas, USA
Abstracts deadline: 15 January 2013

North-Central 2–3 May 2013

Kalamazoo, Michigan, USA
Abstracts deadline: 5 February 2013

Rocky Mountain 15–17 May 2013

Gunnison, Colorado, USA
Abstracts deadline: 12 February 2013

Cordilleran 20–22 May 2013

Fresno, California, USA
Abstracts deadline: 19 February 2013

International—Roof of the World 17–19 June 2013

Chengdu, Sichuan Province, China
Abstracts deadline: 1 March 2013



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Put your professional and academic background, experience applying scientific knowledge to societal challenges, and passion for shaping the future of the geosciences, to work in this coveted arena.

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PREVIEW



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Coastal Processes and Environments under Sea-Level Rise and Changing Climate: Science to Inform Management

Joint Penrose–Chapman Conference Spring 2013

CONVENERS

John B. Anderson, *Dept. of Earth Science, Rice University, Houston, Texas, USA*

Margaret Davidson, *Coastal Services Center, National Oceanic and Atmospheric Administration, Charleston, South Carolina, USA*

John W. Geissman, *Dept. of Geosciences, The University of Texas at Dallas, Richardson, Texas, USA*

Gary J. Hampson, *Dept. of Earth Science and Engineering, Imperial College, South Kensington, London*

Denise J. Reed, *Dept. of Earth and Environmental Sciences, University of New Orleans, New Orleans, Louisiana, USA*

Torbjorn E. Tornqvist, *Dept. of Earth and Environmental Sciences, Tulane University, New Orleans, Louisiana, USA*

This five-day conference will be held in Galveston, Texas, USA, and will include talks describing short-term and long-term impacts of accelerated sea-level rise, climatically induced alteration in sediment delivery to coasts, increased frequency of severe storms, and anthropogenic exacerbation of coastal change.

Sponsors include the Geological Society of America and American Geophysical Union.

Cosponsors include the Society for Sedimentary Geology and the Geological Society, London.



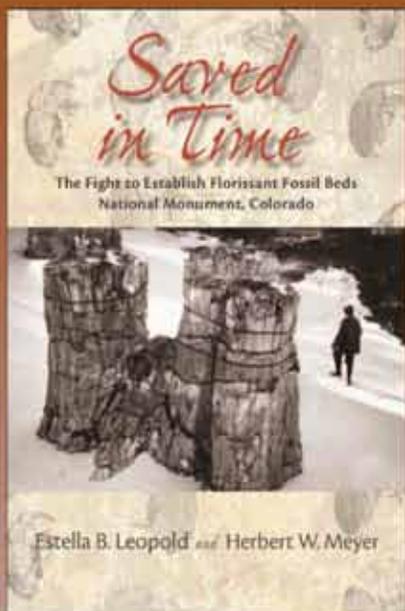
Society for Sedimentary
Geology (SEPM)



Geological Society of
London (GSL)



Look for the full announcement and application details in the coming months!



In the summer of 1969, a federal district court in Denver, Colorado heard arguments in one of the nation's first explicitly environmental cases, in which the Defenders of Florissant, Inc. opposed real estate interests intent on developing lands containing an extraordinary set of ancient fossils. This book, the first account of the fight to preserve the Florissant fossil beds, tells a story of environmental activism that remains little known more than forty years after the coalition's victory. Author Estella Leopold was a major participant in the process.

"Reads like a mystery thriller wherein a handful of committed environmentalists forestall the destruction of America's premier fossils beds." — Jack Loeffler, author of *Adventures with Ed: A Portrait of Abbey*

SAVED IN TIME
The Fight to Establish
Florissant Fossil Beds
National Monument, Colorado

Estella B. Leopold &
Herbert W. Meyer

978-0-8263-5236-1
\$24.95 paper

The University of
New Mexico Press
800.249.7737
unmpress.com



2013 Section Meeting Mentor Programs

STUDENTS:

Interested in Working in Applied Geology?

Meet Your Career Mentors at Your Next GSA Section Meeting!

Sponsored by the GSA Foundation

GSA Contact: Jennifer Nocerino, jnocerino@geosociety.org

When you attend one or both of the mentor luncheons at your 2013 Section Meeting, you'll have the opportunity to chat one-on-one with working geoscientists who want to help

YOU succeed. These mentors will answer your questions and share insights on how to get a job after graduation.

At the free **Roy J. Shlemon Mentor Program in Applied Geoscience** luncheon, you'll be able to discuss career goals, prospects, and challenges with professional geoscientists from multiple disciplines.

Thinking about applied hydrogeology or hydrology as a career? At the free **John Mann Mentors in Applied Hydrogeology Program** luncheon, you'll be able to network and discuss career prospects with hydrogeology professionals.



Northeastern Section Meeting

Bretton Woods, New Hampshire, USA

Shlemon Program in Applied Geoscience: Monday, 18 March
Mann Mentors in Applied Hydrogeology: Tuesday, 19 March



Southeastern Section Meeting

San Juan, Puerto Rico

Shlemon Program in Applied Geoscience:
Wednesday, 20 March
Mann Mentors in Applied Hydrogeology: Thursday, 21 March
Palominito Islet, Puerto Rico. Image courtesy seepuertorico.com.

South-Central Section Meeting

Austin, Texas, USA

Shlemon Program in Applied Geoscience: Thursday, 4 April
Mann Mentors in Applied Hydrogeology: Friday, 5 April
Loop 360 Bridge at Sunset, Austin, Texas, USA. Photo by Dan Herron, HerronStock.com.
Used with permission of the Austin CVB.



North-Central Section Meeting

Kalamazoo, Michigan, USA

Shlemon Program in Applied Geoscience: Thursday, 2 May
Mann Mentors in Applied Hydrogeology: Friday, 3 May
Looking southwest from N. Edwards Street in downtown Kalamazoo, Michigan.
Round-topped towers are the Radisson Plaza hotel.



Rocky Mountain Section Meeting

Gunnison, Colorado, USA

Shlemon Program in Applied Geoscience: Wednesday, 15 May
Mann Mentors in Applied Hydrogeology: Thursday, 16 May
Curecanti National Recreation Area west of Gunnison, which includes Blue Mesa Lake, Colorado's largest body of water. Photo courtesy U.S. National Park Service.



Cordilleran Section Meeting

Fresno, California, USA

Shlemon Program in Applied Geoscience: Monday, 20 May
Mann Mentors in Applied Hydrogeology: Tuesday, 21 May
Death Valley, California, USA. Image courtesy NASA.



THE
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SCIENCE EDITOR

Openings for 2014

GSA is soliciting applications and nominations for science co-editors for *Geology*, *Geosphere*, *GSA Bulletin*, and *GSA Today*, with four-year terms beginning 1 January 2014. Duties include: ensuring stringent peer review and expeditious processing of manuscripts; making final acceptance or rejection decisions after considering recommendations of reviewers; and maintaining excellent journal content through active solicitation of diverse and definitive manuscripts.

Desirable characteristics for a successful editor include:

- a broad interest and experience in geosciences, including familiarity with new trends;
- international recognition;
- a progressive attitude and a willingness to take risks and encourage innovation;
- familiarity with many geoscientists and their work (essential for soliciting and encouraging reviewers);
- comfortable working with online systems, able to make timely decisions, organized; and
- a sense of perspective and humor.

Positions Available

| | | |
|---|-------------------|--|
| GSA Today | 1 position | As editor of one of the most widely read earth science publications in the world, the <i>GSA Today</i> editor must have a wide range of interests and expertise along with the ability to identify research topics of both high quality and broad appeal. Prior experience editing a volume and a publication record in a wide range of journals is key. |
| <i>For the following positions, research interests that would best complement those of the continuing editors include—but are not necessarily limited to—the disciplines listed in parentheses.</i> | | |
| Geology | 1 position | (igneous and/or metamorphic petrology, geochemistry, geodynamics, tectonophysics, economic geology, volcanology) |
| Geosphere | 1 position | (geochemistry, petrology, volcanology, Precambrian geology) |
| GSA Bulletin | 1 position | (volcanology, geochronology, tectonics, petrology, seismology/neotectonics, Quaternary geology/geomorphology, structural geology) |

Interested?

Each editor will work out of his or her current location at work or at home. GSA provides an annual stipend and funds for office expenses; for specifics, contact Jeanette Hammann, +1-303-357-1048, jhammann@geosociety.org. If you wish to be considered, please submit a curriculum vitae and a brief letter describing why you are suited for the position. To nominate another, submit a letter of nomination and the individual's written permission and CV. Send nominations and applications to Jeanette Hammann, GSA Publications, P.O. Box 9140, Boulder, CO 80301, USA; jhammann@geosociety.org. Nominations or applications received by 15 February 2013 will be given first consideration.

Positions Open

FACULTY POSITION

CASE WESTERN RESERVE UNIVERSITY

The Department of Earth, Environmental, and Planetary Sciences at Case Western Reserve University seeks candidates for a tenure-track faculty growth position. We seek outstanding candidates who will complement existing departmental strengths in planetary sciences, geochemistry, and surficial processes. It is anticipated that the position will be filled at the Assistant Professor level, but senior candidates are also encouraged to apply. Candidates at the Assistant Professor level should demonstrate promise for research and teaching excellence; Associate Professor candidates should have established a significant professional reputation; candidates for Professor should be internationally recognized for leadership and scholarship in their discipline. All positions require completion of the Ph.D. degree by July 1, 2013, and a competitive record of research commensurate with rank. The successful candidate will be expected to teach and mentor undergraduate and graduate students within the department, including teaching both introductory and disciplinary courses, and to conduct a vigorous, externally-funded research program that involves post-doctoral, graduate and undergraduate students. The typical teaching load is 2–3 courses per year.

Although applications will be considered at any time, for guaranteed review applications should be received by November 15, 2012. Applicants should send a CV, a letter that describes research interests and teaching experience, and contact information for three references to geosearch@case.edu. Non-electronic submissions may be mailed to the Dept. of Earth, Environmental, and Planetary Sciences, Case Western Reserve University, 10900 Euclid Ave., Cleveland, OH 44106-7216 USA. In employment, as in education, Case Western Reserve University is committed to Equal Opportunity and World Class Diversity. Women, veterans, members of under-represented minority groups, and individuals with disabilities are encouraged to apply. Case Western Reserve University is a past recipient of a National Science Foundation ADVANCE Institutional Transformation Award to increase the participation of women in Science and Engineering. Additional information about the Department and its programs can be found at <http://geology.case.edu/>.

TENURE-TRACK ASSISTANT PROFESSOR SEDIMENTARY GEOLOGY WISCONSIN GEOLOGICAL AND NATURAL HISTORY SURVEY

The Wisconsin Geological and Natural History Survey (WGNHS) invites applications for a tenure-track, assistant professor position in sedimentary geology. We seek candidates with outstanding research and outreach skills and the ability to establish an externally funded research program. This is a 12-month renewable appointment beginning 7/1/2013.

We're looking for someone with a strong research background in the areas of sequence stratigraphy, sedimentology, and geochemistry of siliciclastic systems. Knowledge of the Cambrian geology of the Midwest is a plus. A background in geologic map-

ping and integrated field-based and subsurface studies will also be advantageous. The WGNHS is actively doing research in the areas of carbonate sequence stratigraphy, stable isotope geochemistry, and fluvial sedimentology; this new position offers the opportunity to both collaborate and expand research into new areas.

The WGNHS, a division of UW System based in Madison, Wisconsin, is a nationally recognized research institution. Our academic atmosphere, focus on research and outreach, and compact size set us apart from most geological research organizations. We offer a growing subsurface collection, including more than 2,000 drill cores from across the state and region, which provides the raw materials for cutting-edge science. Our work educates and informs Wisconsin residents, government officials, and industry professionals about critical environmental and resource issues. For more information, visit <http://wisconsin Geological Survey.org>. Application deadline is November 27, 2012. AA/EEO Employer.

TENURE-TRACK ASSISTANT PROFESSOR QUATERNARY GEOLOGY WISCONSIN GEOLOGICAL AND NATURAL HISTORY SURVEY

The Wisconsin Geological and Natural History Survey (WGNHS) invites applications for a tenure-track, assistant professor position in Quaternary geology. We seek candidates with outstanding research and outreach skills and the ability to establish an externally funded research program. This is a 12-month renewable appointment beginning July 1, 2013.

We're looking for someone with a strong research background in the areas of glacial geology, geochemistry, geochronology, geomorphology and/or engineering geology to be applied to the study of Wisconsin's glacial deposits. The successful candidate will collaborate with academic institutions within Wisconsin and beyond, as well as with local, state, and federal agencies that have interests in geology, hydrogeology, and mineral resources.

The WGNHS, a division of UW System and located in Madison, Wisconsin, is a nationally recognized research institution. Our academic atmosphere, focus on research and outreach, and compact size set the WGNHS apart from most geological research organizations. In addition, our 20,000 sq. ft. core repository serves as a unique research laboratory for studying Wisconsin's rich glacial history. Take this opportunity to grow with us. For more details, please visit <http://wisconsin Geological Survey.org>. Application deadline is November 27, 2012. AA/EEO Employer.

TENURE TRACK APPOINTMENT IN EARTH SCIENCE EDUCATION NORTHERN ILLINOIS UNIVERSITY

Northern Illinois University invites applications for an anticipated tenure-track position in Earth Science Education with secondary science teacher certification, at the rank of Assistant Professor with a starting date of August 16, 2013. The successful candidate will hold a joint position with the NIU Center for Secondary Science and Math Education (CSSME) and the Dept. of Geology and Environmental Geosciences. Both teacher certification credentials (either state certification or teaching experience in a US high school) and a Ph.D. in geology or related

area are required at the time of appointment. Teaching duties will include graduate and undergraduate courses, including teacher certification classes, in earth sciences. The successful candidate will also be expected to develop a nationally recognized and externally funded research program either in earth science education and/or an area of geology. For additional information about the position and the Geology & Environmental Geosciences Dept., see www.niu.edu/geology/. Applications including CV, statement of teaching and research interests, and 3 letters of recommendation should be submitted electronically to: Paul Stoddard, Earth Science Education Search Committee Chair, Geology & Environmental Geosciences, via teachgeology@niu.edu. Applications will be considered until the position is filled but first preference will be given to applications received by November 30, 2012. NIU is an AA/EEO Institution that values diversity in its faculty, staff and students: we strongly encourage applications from diverse candidates including women and minorities. A state-mandated pre-employment criminal background investigation is required

SEDIMENTOLOGY AND STRATIGRAPHY WESTERN WASHINGTON UNIVERSITY

Western Washington University invites applications for a tenure-track Assistant Professor with research and teaching specialties in sedimentology and stratigraphy. The appointment will begin effective September 16, 2013. The ideal candidate will enhance our existing strengths in field geology, geomorphology, geophysics, and structural geology/tectonics. Some examples of desirable research directions include basin evolution, marine/coastal processes, use of multi-faceted provenance data to evaluate sediment transport and test different tectonic models examining climate signals recorded by sediments and sedimentary rocks. Candidates must have a Ph.D. in an appropriate Earth Science field at the time of appointment; teaching/research specialty in sedimentology and stratigraphy; ability to teach sedimentology, stratigraphy, introduction to Geology, and historical geology; ability to develop high-quality undergraduate teaching program; ability to establish externally-supported research program; ability to involve students in research; ability to contribute to graduate (MS) degree program. Preferred qualifications include post-doctoral experience; college-level teaching experience; ability to teach GIS, contribute to our geology field courses; and ability to work with a diverse student body. Interested candidates must apply online. To see full position description and log in to WWU's Electronic Application System for Employment (EASE), please go to <https://jobs.wwu.edu/JobPosting.aspx?PID=3732>. Applications need to include a cover letter outlining your teaching and research experience and accomplishments with specific reference made to the required and preferred qualifications described above. The application should also include a C.V., graduate school transcripts, statements describing teaching and research philosophy and effectiveness, as well as goals and plans for teaching and research at WWU. Letters of reference from four persons familiar with the candidate's research and teaching must be provided and available for review by December 10, 2012; one of these references must be from outside

the applicant's current institution. Send letters to the Geology Department or email them to the search committee chair. Review of all application materials will begin on December 10, 2012; position is open until filled. Questions regarding this position should be directed to the search committee chair, Thor Hansen (Thor.Hansen@wwu.edu) or the Geology Dept. chair, Bernie Housen (bernieh@wwu.edu). WWU is an EO/AA employer and encourages applications from women, minorities, persons with disabilities and veterans.

**PEVEHOUSE CHAIR IN GEOSCIENCES
AN ENDOWED POSITION IN
PETROLEUM GEOSCIENCES
TEXAS TECH UNIVERSITY**

The Department of Geosciences at Texas Tech University invites applications for the Pevehouse Chair in Geosciences. The purpose of this endowed position is to support innovative research and education focused on the origin, exploration, and recovery of conventional and unconventional hydrocarbon resources. A Ph.D. in geosciences or closely allied field is required, as is a record of petroleum-related research as demonstrated by professional publications. The chair holder is expected to conduct a vigorous, externally-funded research program that may involve collaboration with the petroleum industry. The successful candidate will teach graduate and undergraduate courses, and direct graduate student research. The position is expected to be filled at the tenured full professor level. Texas Tech University will continue to strengthen research and education in petroleum geoscience by adding a new junior faculty member to this program in FY 2014.

Texas Tech is a state-supported, graduate research-oriented university with over 32,000 students. The Dept. of Geosciences consists of twenty-four tenured/tenure-track faculty, with teaching and research emphases in solid earth geosciences, atmospheric science, and geography. It offers degree programs in solid earth geosciences at the BS, MS, and Ph.D. levels. The department currently has more than 200 undergraduate majors and more than 60 graduate students. The department computer labs are well-equipped with GIS, geologic mapping/modeling, and seismic processing/interpretation software packages. Available experimental/analytical facilities include a stable isotope laboratory, laser ablation ICP-MS, ICP-AES, TEM, SEM, XRF, XRD, a heat flow lab, and remote sensing spectroradiometers. Additional information on the department can be found at website www.depts.ttu.edu/gesc/. In addition, the Dept. of Petroleum Engineering maintains experimental and analytical facilities in petrophysics, drill fluids, cement, enhanced recovery, and reservoir simulation, as well as X-ray CT/nuclear magnetic resonance imaging lab.

Lubbock is located on the Southern High Plains in close proximity to the Permian Basin. The city has a population of over 225,000 and the semi-arid climate is conducive to outdoor activities. Cultural amenities include musical, theatrical, and sports events, and the city offers numerous options for shopping and dining. The city also offers the best healthcare facilities in the region, including the university's Health Sciences Center. The cost of living is low compared to national norms.

Applicants must first go to the employment website of the university at <http://jobs.texasstate.edu>. There, go to "Search Postings," search for requisition number 87107, and fill out necessary forms in applying for the position on-line. Then, applicants should submit a letter of application, curriculum vitae, a statement of teaching and research interest, names and contact information (including e-mail address) of at least 3 professional references. These documents should be uploaded to the employment website and we request that copies be emailed or sent directly to: Dr. Calvin Barnes, Pevehouse Chair Search Committee, Dept. of Geosciences, Texas Tech University, MS 1053, Lubbock, TX 79409-1053.

E-mail questions regarding the position are received at cal.barnes@ttu.edu. Review of applicants will begin January 1 and continue until the position is filled.

Texas Tech University is an affirmative action/equal opportunity employer, committed to excellence through diversity. Texas Tech welcomes applications from minorities, women, veterans and persons with disabilities.

**TENURE-TRACK ASSISTANT PROFESSOR
IN GEOSCIENCES (PHYSICAL GEOGRAPHY-
CLIMATOLOGY, PALEOCLIMATOLOGY-
DENDROCHRONOLOGY),
UNIVERSITY OF ARKANSAS**

The Department of Geosciences, University of Arkansas-Fayetteville invites applications for a 9-month appointment as a tenure-track assistant professor with an anticipated start date of August 2013. We seek an outstanding individual with expertise in Physical Geography specializing in climatology, paleoclimatology, or dendrochronology. This individual is expected to develop an independent, externally funded research program, in addition to pursuing collaboration and synergism with ongoing research in the Dept. of Geosciences (<http://geosciences.uark.edu>). **All Ph.D. requirements completed at the time of the appointment.** Strong preference will be given to applicants with current strengths in dendrochronology, geoinformatics, watershed science, and or environmental dynamics. Teaching duties will include introductory geosciences, conservation of natural resources, and upper division undergraduate or graduate courses in climatology and or the candidate's field of interest.

Review of applications will begin November 26, 2012, and will continue until the position is filled. Applicants should submit their curriculum vitae, brief statements of research and teaching interests, and the names and contact information for at least three professional references to the search committee chair: Dr. Stephen Boss, Dept. of Geosciences, 346 Arkansas Avenue, Fayetteville, AR 72701, or preferably via email a compiled PDF to sboss@uark.edu.

The University of Arkansas is a nationally competitive student-centered research university with a RU/VH Carnegie Classification. It is the flagship campus of the University of Arkansas system. The Dept. of Geosciences is an interdisciplinary program composed of 22 faculty in Geography and Geology offering bachelor and master degrees in geography and geology, and it recently established a new Ph.D. program in Geosciences effective August 2012. The Department also participates in two interdisciplin-

ary Ph.D. programs in Space and Planetary Sciences and Environmental Dynamics. The department is also closely affiliated with the Center for Advanced Spatial Technologies (CAST), Tree-Ring Laboratory, Arkansas Water Resources Center, and the University of Arkansas Stable Isotope Laboratory.

Fayetteville, nestled in the Ozark Mountains of northwest Arkansas, is a great place to work, play, and raise a family. The city has highly-ranked public and private K-12 schools. Fayetteville retains a small college-town atmosphere amidst a growing metropolitan area of more than 420,000 people. The area is home to the headquarters of major companies that include Wal-Mart, J.B. Hunt, and Tyson, Inc. Cultural attractions include the Walton Arts Center and the Crystal Bridges Museum of American Art. Popular outdoor activities include hiking, boating, canoeing, climbing, hunting, and fishing. The University was recently ranked a Top 25 college for outdoor enthusiasts by *Outside Magazine* in August 2012.

The University of Arkansas is an Affirmative Action/Equal Opportunity Employer. The University welcomes applications without regard to age, race, gender, national origin, disability, religion, marital or parental status, veteran status, genetic information or sexual orientation. Applicants must have proof of legal authority to work in the United States. All applicants are subject to public disclosure under the Arkansas Freedom of Information Act.

**TENURE-TRACK ASSISTANT PROFESSOR
IN GEOSCIENCES
(MINERALOGY/PETROLOGY/
GEOCHEMISTRY),
UNIVERSITY OF ARKANSAS**

The Dept. of Geosciences, University of Arkansas-Fayetteville, invites applications for a 9-month appointment as a tenure-track assistant professor with an anticipated start date of August 2013. We seek an outstanding individual with expertise in mineralogy, petrology, and/or geochemistry. This individual is expected to develop an independent, externally-funded research program, in addition to pursuing collaboration and synergism with ongoing research in the Dept. of Geosciences (<http://geosciences.uark.edu>). **All Ph.D. requirements completed at the time of the appointment.**

Strong preference will be given to applicants who can utilize and expand the existing Nu Plasma II MC-ICP-MS facility supported by the Space and Planetary Sciences program. The successful applicant will be an integrated scholar responsible for meeting departmental goals in research, service, advising graduate-level research, and having a strong commitment to teaching at all levels.

Review of applications will begin November 28, 2012, and will continue until the position is filled. Applicants should submit their curriculum vitae, brief statements of research and teaching interests, and the names and contact information for at least three professional references to the search committee chair: Dr. Gregory Dumond, Dept. of Geosciences, 346 Arkansas Avenue, Fayetteville, AR 72701, or email a compiled PDF to gdumond@uark.edu.

The University of Arkansas is a nationally competitive student-centered research university with a RU/VH Carnegie Classification. It is the flagship campus of the University of Arkansas system. The Dept. of

Geosciences offers bachelor and master degrees in geology and geography, and it recently established a new Ph.D. program in Geosciences effective August 2012. The Department also participates in two interdisciplinary Ph.D. programs in Space and Planetary Sciences and Environmental Dynamics.

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SEDIMENTOLOGIST

NEW MEXICO STATE UNIVERSITY

The Department of Geological Sciences seeks applications from sedimentologists who are interested in teaching and research in a geologically and culturally diverse environment in the Rio Grande rift of southern New Mexico for a permanent, 9-month, tenure track position as Assistant Professor.

For more information, including application procedures, see the www.nmsu.edu/~geology/ and the advertisement on the NMSU job web site at www.nmsu.edu/~personel/postings/faculty/16501738.html. NMSU is an EEO/AA employer.

ASSISTANT PROFESSOR OF ATMOSPHERIC OR HYDROLOGICAL SCIENCES

UNIVERSITY OF ILLINOIS AT CHICAGO

The Department of Earth and Environmental Sciences at the University of Illinois at Chicago (UIC) invites applications for a tenure-track Assistant Professor whose research interests incorporate atmospheric and/or hydrological sciences. Specialization may include field- and/or laboratory-based measurements, remote sensing, and numerical modeling, with relevance to global processes and the Earth as a system. The successful candidate will establish an innovative and productive program of scientific research, teach graduate and undergraduate courses, and mentor students. Women and minority candidates are strongly encouraged to apply. Applicants must have a Ph.D. and a record of research accomplishments; postdoctoral experience is preferred. The Department is ranked nationally in the top 10% in terms of research activity (2010 NRC Survey of Geoscience Departments), has extensive laboratory facilities, and hosts a diverse and growing undergraduate and graduate student body. To apply please complete the online application providing

contact information of three professional references at <https://jobs.uic.edu> (click on the Job Board and then on the position link) and upload a curriculum vitae, a numbered list of publications and overview of research plans. For fullest consideration please apply by November 15, 2012. Final authorization of the position is subject to availability of state funding. UIC is one of the nation's leading urban research universities and an Affirmative Action/Equal Opportunity Employer.

NEOTECTONICIST

NEW MEXICO STATE UNIVERSITY

The Department of Geological Sciences seeks applications from neotectonicists who are interested in teaching and research in a geologically and culturally diverse environment in the Rio Grande rift of southern New Mexico for a permanent, 9-month, tenure-track position as Assistant Professor.

For more information, including application procedures, see www.nmsu.edu/~geology/ and the advertisement on the NMSU job web site at www.nmsu.edu/~personel/postings/faculty/16554338.html. NMSU is an EEO/AA employer.

TENURE-TRACK, ASSISTANT PROFESSOR

STRUCTURAL GEOLOGY

EASTERN WASHINGTON UNIVERSITY

The Department of Geology in the College of Science, Health & Engineering at Eastern Washington University invites applications for a tenure-track assistant professor position in Structural Geology located on our Cheney Campus to begin September 2013. Responsibilities include teaching and curriculum development at the undergraduate level (in the classroom and field), scholarly and service activities. A Ph.D. in Geology must be conferred by 09/15/2013. Candidates must offer some college level teaching experience in Geology. Additional requirements include demonstrated expertise in Structural Geology, demonstrated potential for scholarship, and an ability to co-teach at EWU's annual summer Field Camp in southwestern Montana. For complete information about the position, its required and preferred qualifications, and the application instructions, visit Eastern's jobs portal: <https://jobs.hr.ewu.edu>. To be assured full consideration, application materials must be submitted through the jobs portal by November 16, 2012; three confidential letters of reference must be sent directly to the Dept. of Geology, SCI 130, Cheney, WA, 99004 by November 23, 2012. Screening of applications will begin following the GSA meeting in Charlotte, NC. Applications will not be accepted through email, mail, or any other mode of delivery. Eastern is an affirmative action/equal opportunity employer, and applications from members of historically underrepresented groups are especially encouraged.

ASSISTANT OR ASSOCIATE PROFESSOR

EXPLORATION SEISMOLOGY

DEPARTMENT OF GEOLOGY AND

GEOPHYSICS, UNIVERSITY OF UTAH

The Dept. of Geology and Geophysics at the University of Utah seeks applicants for a tenure track position at the Assistant or Associate Professor level in Exploration Seismology.

We are interested in creative candidates who will teach exploration seismology to geology and geophysics

students at both the undergraduate and graduate levels, and contribute to our energy geoscience initiatives. The candidate's research can be any area of exploration seismology including but not limited to: data acquisition, signal and image processing, and interpretation. The primary applications of research should be at the scale of basins, the upper crust, or within the shallow subsurface. For specific information and requirements, and /or to apply, go to: <http://utah.peopleadmin.com/postings/18615>.

The University of Utah is an Equal Opportunity/Affirmative Action employer and educator. Minorities, women, and persons with disabilities are strongly encouraged to apply. Veterans preference. Reasonable accommodations provided. For additional information: www.regulations.utah.edu/humanResources/5-106.html.

The University of Utah values candidates who have experience working in settings with students from diverse backgrounds, and possess a strong commitment to improving access to higher education for historically underrepresented students.

FACULTY POSITION

PALEOBIOLOGY AND GEOBIOLOGY

VIRGINIA TECH DEPT. OF GEOSCIENCES

The College of Science at Virginia Tech, in support of the university's strategic plan, is expanding its research presence in Energy and the Environment through interdisciplinary faculty hires across departments (for further information, visit www.science.vt.edu under *faculty openings*). As part of this initiative, the Department of Geosciences (www.geos.vt.edu) anticipates a tenure-track opening in Paleobiology and Geobiology, to start in Fall 2013 at our Blacksburg, VA Campus. The department is an international leader in many areas of Geosciences research, with six new members added to its faculty in the last two years. For the new position, the successful candidate needs to have outstanding research/teaching experience that explores the paleontological record using observational, experimental, and quantitative methods to reconstruct the co-evolutionary history of the biosphere and Earth's surface environment at various spatial and temporal scales. Appointment at the assistant professor level is anticipated.

The successful candidate will be expected to establish a vigorous research program, teach effectively at the undergraduate and graduate levels, continue development of scholarly activities and professional capabilities, and participate in department, college, and university governance. Occasional travel to attend professional conferences is required. Applicants must have a Ph.D. degree in Geosciences or a related discipline at the time of appointment, have demonstrated capability/promise to develop an active research program, and pass a criminal background check. Preference will be given to candidates whose research areas complement existing strengths in the department.

Questions regarding the new position can be directed to Search Committee chair Dr. Shuhai Xiao (xiao@vt.edu). To receive full consideration, applications must be submitted online (www.jobs.vt.edu; reference posting #0122338) by December 21, 2012, and should include a cover letter, resume, research statement, teaching statement, and contact information of

at least four referees. Salary will be commensurate with rank and experience. Virginia Tech is an EO/AA university, and offers a wide range of networking and development opportunities to women and minorities in science and engineering. Individuals with disabilities desiring accommodations in the application process should notify Mrs. Ellen Mathena at 540-231-6894, or call TTY 1-800-828-1120.

FACULTY POSITIONS, UNIVERSITY OF HOUSTON

The Department of Earth and Atmospheric Sciences of the University of Houston invites applicants for the following tenure track faculty positions. Candidates must have completed their Ph.D. at the time of appointment. Successful candidates will be expected to build a vigorous externally-funded research program, and should be able to demonstrate productivity in peer-reviewed publication. Candidates will also be expected to teach at both the undergraduate and graduate levels and will be expected to mentor MS and Ph.D. students. We expect to fill the positions by August 2013. Candidate evaluation will begin November 12, 2012 and continue until the position is filled.

Exploration Geophysics. Assistant to Full Professor level in the field of Exploration Geophysics, specializing in reflection seismic processing, imaging, and interpretation. We seek candidates of outstanding ability in signal processing, algorithm development, and seismic data analysis. Strength in subjects such as elastic-wave propagation, tomography, migration, and inversion will be especially valued. The successful candidate should have the ability to use high-performance computing to image, visualize, and interpret seismic data and will have use of our wide variety of seismic software packages, hardware systems, and geophysical data. The successful candidate will participate with an enthusiastic team of geophysics faculty and students in one of the leading energy communities in the world. Preference will be given to candidates with related industry experience.

Organic Geochemistry. Assistant to Full Professor level in the broad field of organic geochemistry. Applicants should have experience in the application of chemical principles to the study of the origin, migration, accumulation, and alteration of hydrocarbons and organic contaminants using a range of petroleum geochemical techniques, such as stable isotope geochemistry, hydrocarbon analysis of organic compounds and biomarkers with GC and GC-MS, vitrinite reflectance or other maturity indicators, laboratory pyrolysis, and/or kerogen typing. The successful candidate will also enjoy access to new major and sophisticated organic geochemical research equipment being delivered in the Fall of 2012 to the Department, including an Agilent GC-QQQ 7000, an Agilent GC-Q-TOF 7200, an Agilent GC-MS 5975, an Agilent GC 7890, a Finigan Delta 5 Gas Stable Isotope Mass Spectrometer coupled with a GC-C-IRMS, and a Rock Eval VI Pyrolysis Instrument. Research analytical expertise in these instruments and/or experience in related environmental organic fluid and rock geochemistry, especially aligned with studies of water quality, identifying natural water and rock contaminants and toxicity levels, carrying out epidemiologic environmental forensics studies, environmental remediation

monitoring, and/or ground water quality studies in gas and oil shale fracking regions, is considered advantageous to the broad areas of research in the Department.

Sedimentary Geology. Assistant Professor level in the general field of Sedimentary Geology and Stratigraphy. Candidates may conduct research on ancient or modern systems and may have expertise in areas such as facies and stratigraphic architecture, sedimentary petrology, experimental or numerical modeling, and/or reservoir characterization. Ideally the candidate will have experience with field-based research to solve fundamental geological problems. This position is linked to the UH Energy initiative, and we encourage applications from candidates with some industry experience.

Information for Applicants. Candidates for each position should submit: 1) a letter of application including statements of teaching and research interests, 2) a curriculum vitae, and 3) three letters of reference (letters must be received before the applications will be considered) to: Dr. Janok P. Bhattacharya, Chair, Dept. of Earth and Atmospheric Sciences, College of Natural Sciences and Mathematics, Room 312 Science Research 1, University of Houston, 4800 Calhoun Rd., Houston, Texas 77204-5503.

Signed reference letters may be submitted by referees as attached files via email to Penny Maher: plmaher@uh.edu. Further information can be obtained by viewing the departmental web page at www.geosc.uh.edu/ or by calling the Department at (713) 743-3399.

The University of Houston is an Equal Opportunity/Affirmative Action Employer. Minorities, women, veterans, and persons with disabilities are encouraged to apply.

SEISMOLOGY FACULTY POSITION THE OHIO STATE UNIVERSITY

The School of Earth Sciences (SES) in the College of Arts and Sciences at The Ohio State University invites applications for a newly established tenure-track position in Seismology. Information about the School of Earth Sciences can be found at www.earthsciences.osu.edu.

We are seeking applicants with a doctoral degree and interests that support the SES Strategic Plan's focus areas in Energy Science and Deep Earth-Deep Time. Applicants will have skills and interests in both basic and applied research in such areas as energy exploration, reflection seismology, subsurface characterization, earth structure, history and dynamics, or natural hazards. We are seeking individuals who will work across disciplines within SES and collaborate with faculty specializing in energy and mineral physics, stratigraphy, structural geology, geodesy and tectonics. The successful candidate will be one whose research focus in seismology is oriented toward the energy sciences, and who is able to teach basic earthquake and reflection seismology as well as educate students for the energy industry.

The successful applicant is expected to have a developing record of research achievements including publications. The new faculty member will be expected to teach graduate and undergraduate courses. Our Bachelor of Science program has tracks in geological sciences, earth system science, geophysics, and petroleum geology & geophysics. The new

hire is also expected to develop a research program and generate external research funds. The position will be filled at the rank of Assistant Professor. Applications will be reviewed beginning November 1, 2012. The anticipated start date is September 1, 2013.

Applicants should submit a letter of application, curriculum vitae, and a statement of research interest and teaching philosophy to: Seismology Search Committee, School of Earth Sciences, 275 Mendenhall Laboratory, 125 S. Oval Mall, Columbus, OH 43210.

Email applications, as a single, compiled pdf file will also be accepted at: seismo-search@earthsciences.osu.edu.

The candidate should also provide at least three references who may be asked to write letters of recommendation.

To build a diverse workforce, Ohio State encourages applications from those with disabilities, minorities, veterans, and women. EEO/AA employer. Ohio State is an NSF ADVANCE institution.

BASIN RESEARCH AND ENERGY GEOLOGY STATE UNIV. OF NEW YORK AT BINGHAMTON

Binghamton University seeks applications for a tenure-track position in sedimentary basin research at the assistant or associate professor level to begin in August 2013. We seek exceptional candidates with research and teaching interests in basin-scale processes. Areas of interest include but are not limited to: clastic depositional systems; basin-scale diagenesis; geophysical modeling; depositional modeling; tectonic modeling; and modern stratigraphic analysis. A fundamental understanding of well logs and seismic analysis is essential, although candidates need not be expert in these petrophysical tools.

The successful candidate must develop and sustain a nationally recognized, externally funded research program in basin analysis. We also expect the candidate to develop a strong record of teaching and mentoring students and teach undergraduate and graduate level courses in his/her area of expertise. We are seeking candidates who will strengthen existing research programs in geochemistry, sedimentary geology, or Earth surface processes with the potential to interact with geologists, environmental scientists and engineers on the Binghamton University campus.

Candidates must have a Ph.D. with a focus in basin research or a related field, at the time of appointment; preference will be given to candidates with post-doctoral research or industry experience. Interested candidates should submit a letter of application, curriculum vitae, statements of research and teaching interests, and names and contact information of at least three references to the Binghamton University Interview Exchange site at <http://binghamton.interviewexchange.com>. For further information about the position, visit the Geological Sciences and Environmental Studies website (www.geology.binghamton.edu) or contact Professor Karen Salvage by e-mail: ksalvage@binghamton.edu.

Women and minorities are encouraged to apply. Binghamton University is strongly committed to affirmative action. Recruitment is conducted without regard to race, color, sex, religion, disability, marital status, sexual orientation, or national origin. Applications will be considered until the position is filled, but priority will be given to those received by November 30, 2012.

**ASSISTANT/ASSOCIATE PROFESSOR OF
GLOBAL-CHANGE SCIENCE EDUCATION
DEPARTMENT OF MARINE, EARTH AND
ATMOSPHERIC SCIENCES**

NORTH CAROLINA STATE UNIVERSITY (NCSU)
The Department of Marine, Earth and Atmospheric Sciences (MEAS) at North Carolina State University (NCSU) seeks an exemplary candidate to fill a new tenure-track position at Assistant or Associate Professor level in global-change science education, beginning Fall 2013. We seek a creative and dynamic educator who can show a distinguished record of publication in geoscience education research and expertise in a discipline area that falls within the boundaries of global-change science.

Applicants must hold a Ph.D. at the time of the appointment and have a background in the geosciences or a related discipline. The successful candidate must demonstrate strong potential for outstanding accomplishments in research, research supervision, and teaching. In addition, they should be prepared to collaborate with other departmental and/or college faculty in STEM education positions. Candidates may have opportunities for involvement with informal science education initiatives with the NC Museum of Natural Sciences and are encouraged to participate as an instructor in the MEAS Professional Science Master's (PSM) Degree Program in Climate Change and Society. The PSM program may also provide an arena for education scholarship and research; where appropriate, the new hire may supervise PSM students in their capstone research projects.

The specific duties of the new faculty member will include teaching an undergraduate course in climate science/Earth-system science/global change and offering a graduate course with a focus on global-change education and/or communicating global-change science. The successful candidate will be expected to develop an externally funded research program that will support MS and Ph.D. students in MEAS and focus on enhancing student learning and scientific literacy in global-change science in undergraduate, postgraduate and/or informal settings.

NCSU is a vibrant land-grant research and teaching institution comprising ten colleges and offering outstanding opportunities for cross-campus research initiatives. Within MEAS, opportunities exist for the successful candidate for disciplinary and interdisciplinary interactions with more than 30 other faculty. NCSU is home to a new joint venture with the National Oceanographic and Atmospheric Administration, the Cooperative Institute for Climate and Satellites – North Carolina: <http://cicsnc.org/>, the Dept. of Interior's Southeast Climate Science Center: www.doi.gov/csc/southeast/index.cfm, and the Center for Marine Sciences and Technology: www.cmast.ncsu.edu/. Additional information about NCSU can be found on our web page: www.ncsu.edu/ and about MEAS and its facilities at: www.meas.ncsu.edu.

Review of applications will begin November 30, 2012; the position will remain open until filled. Applications, including a cover letter, curriculum vita, statements of teaching and research philosophy, and contact information for three references must be submitted online at <https://jobs.ncsu.edu/> applicants. Please contact Dr. David McConnell

(david_mcconnell@ncsu.edu) with any inquiries regarding the position.

NCSU is an equal opportunity and affirmative action employer. All qualified applicants will receive consideration for employment without regard to race, color, national origin, religion, sex, age, veteran status, or disability. In addition, NC State University welcomes all persons without regard to sexual orientation. Applications from women, minorities, and persons with disabilities are encouraged. The College of Physical and Mathematical Sciences welcomes the opportunity to work with candidates to identify suitable employment opportunities for spouses or partners.

**HYDROGEOLOGY/EARTH FLUIDS
FACULTY POSITION
THE OHIO STATE UNIVERSITY**

The School of Earth Sciences in the College of Arts and Sciences at The Ohio State University invites applicants for a newly established tenure-track position in Hydrogeology/Earth Fluids. Information about the School of Earth Sciences can be found at www.earthsciences.osu.edu.

We are seeking applicants with a doctoral degree and a wide-range of interests in the flow of fluids related to energy and environment. The candidate's research interests should cut across and support the focus areas of the School's Strategic Plan: Energy Sciences, Deep Earth-Deep Time, Measuring a Changing Planet, and Climate and Water and the University's Energy and Environment Discovery Theme. Applicants will have skills and interests in the subsurface movement of oil, gas, and/or water. These interests could include determining reservoir/aquifer properties, multiphase and variable-density fluid flow, solute/heat transport, and environmental impacts of resource extraction. An ability to characterize small-scale phenomena to study larger-scale processes is desired. Examples of advanced capabilities could be use of isotopic tracers to examine flow paths hydrocarbons, contaminants, and/or groundwater; geophysical/fluid flow techniques in support of modeling; impact of petroleum/gas extraction on ground-water quality; and novel techniques and modeling for the development of unconventional and conventional oil and gas resources, and flow regimes.

The successful applicant is expected to have a developing record of research achievement through publications. The new faculty member will contribute to teaching in our graduate programs and in our undergraduate curriculum. Our Bachelor of Science program contains four tracks, geological sciences, Earth system sciences, geophysics, and petroleum geology. The new hire is also expected to develop a research program and generate external funds. The position will be filled at the rank of Assistant Professor. Applications will be reviewed beginning November 1, 2012. The anticipated start date is September 1, 2013.

Applicants should submit a letter of application, curriculum vitae, and statements of research interests and teaching philosophies to: Hydrogeology/Earth Fluids Search Committee, School of Earth Sciences, 275 Mendenhall Laboratory, 125 S. Oval Mall, Columbus, OH 43210-1398.

The candidate should provide names of at least three references who may be asked to write letters of recommendation.

To build a diverse workforce, Ohio State encourages applications from those with disabilities, minorities, veterans, and women. Ohio State is an NSF ADVANCE institution and an EEO/AA employer.

**GEOPHYSICS, ASSISTANT OR ASSOCIATE
PROFESSOR, NEW MEXICO INSTITUTE OF
MINING AND TECHNOLOGY**

The Department of Earth and Environmental Science of the New Mexico Institute of Mining and Technology invites applications for a tenure-track Assistant or Associate Professor position in the broad area of geophysics. The candidate's research should address significant geophysical or geological questions, preferably with applications to energy-related geoscience. While we will consider all outstanding candidates, we are particularly interested in those who complement existing strengths in the department, and will conduct research and teaching in one or more of the following areas: active-source seismology, shallow geophysical methods, seismic stratigraphy, and petroleum geology and basin analysis.

Applicants must have a Ph.D. in Earth Sciences or a related field at the time of appointment, as well as a significant record of research productivity. Potential for excellence in research, teaching, and building energy industry and academic collaborations are the most important qualifications.

Responsibilities include the development of a vigorous, independent, and externally funded research program supporting M.S. and Ph.D. students, teaching two to three courses per year (graduate and/or undergraduate), student advising, and service to the department, institute, state, national, and international Earth Science communities. The successful applicant will be expected to develop and maintain significant department faculty and student interactions with the energy industry. For further information, see www.nmt.edu, and/or contact search committee chair Susan Bilek (sbilek@nmt.edu) or co-chair Rick Aster (aster@ees.nmt.edu).

Applicants should submit a statement of research and teaching interests and goals, a curriculum vitae, and the names of three or more references to: Geophysics Search, New Mexico Tech, Human Resources Dept., 801 Leroy Place, Socorro, New Mexico 87801. Email applications cannot be accepted. Official transcripts of pre- and post-graduate studies will be required if selected to interview. For full considerations, applications should be received by December 15, 2012. New Mexico Tech is an equal opportunity/affirmative action employer.

**TENURE TRACK POSITION
MINERALOGY/MATERIAL SCIENCE
TEMPLE UNIVERSITY**

The Department of Earth and Environmental Science at Temple University seeks applicants for a tenure-track position at the level of Assistant or Associate Professor in mineralogy and material science whose research emphasizes the emerging fields of Environmental Mineralogy, Medical Mineralogy, or Nanoscience to begin in August 2013.

The successful candidate will have a Ph.D. degree, an established record of accomplishment in their discipline, a strong commitment to teaching and student mentoring, and a keen interest in collaboration with other faculty at Temple University to

build a new Geoscience Ph.D. program. The candidate is expected to complement existing specialties in our department, including low-temperature aqueous geochemistry, hydrology, environmental geophysics, structural geology, mineralogy, coastal geomorphology, soils, sedimentology/stratigraphy, and paleoclimatology.

Available analytical instrumentation includes: X-ray fluorescence, magnetic susceptibility, electron microprobe, liquid chromatography/mass spectrometry, Raman spectroscopy, automated powder, single crystal, and thin film XRD, SEM and TEM with EDS, as well as access to high-performance computing.

The deadline for applications is January 7, 2013. Applications should include a CV, statement of research goals, description of potential classes and teaching philosophy, names and addresses of at least three references (five if applying at the Associate level), and copies of selected reprints. Applications should be submitted electronically via the link on the Department website: www.temple.edu/geology and letter of intent emailed to Jonathan Nyquist, Department chair (nyq@temple.edu).

Temple University is an affirmative action and equal opportunity employer committed to equal access and to achieving a diverse community. The department specifically invites and encourages applications from women and minorities. We will be available to meet with candidates at the 2012 Annual GSA and AGU meetings in Charlotte and San Francisco.

FIELD-BASED GEOSCIENTIST, COLBY COLLEGE

Colby College is seeking a field-based Geoscientist to fill a tenure-track position as Assistant Professor of Geology to begin September 1, 2013. The successful candidate should have broad training with expertise in mineralogy, a strong commitment to undergraduate education and an active research program. Candidates should have a Ph.D. at the time of appointment. Teaching responsibilities will include participation in a gateway geology course, intermediate-level mineralogy and petrology courses with a laboratory component, and either a non-majors geology course without lab or an advanced majors course of potential interdisciplinary interest, in an area of the candidate's interest and expertise. Opportunities exist for interdisciplinary collaborations at Colby and at the Bigelow Laboratory of Ocean Sciences in Boothbay Harbor. Familiarity with liberal arts colleges is desirable.

Please submit a letter of application, statement of teaching philosophy and research interests, *curriculum vitae*, undergraduate and graduate transcripts, three selected publications, and three letters of recommendation to geo.mineralogy@colby.edu. Receipt of applications will be confirmed. For questions about the position, contact Prof. Herb Wilson, Chair, Dept. of Geology, Colby College, 5739 Mayflower Hill, Waterville, ME 04901 (Telephone: 207-859-5739, e-mail: geo.mineralogy@colby.edu). Application review will begin November 15, 2012 and will continue until the position is filled.

Women candidates will be considered for a Clare Boothe Luce Assistant Professorship, which includes dedicated annual research funds and salaries for undergraduate research assistants.

Colby College is committed to equality and diversity and is an equal opportunity employer. We encourage inquiries from candidates who will contribute to the cultural and ethnic diversity of our college. Colby College does not discriminate on the basis of race, gender, sexual orientation, disability, religion, ancestry or national origin, or age in employment or in our educational programs. For more information about the College, please visit our website: www.colby.edu

FACULTY POSITION SOLID EARTH PROCESSES UNIVERSITY OF ROCHESTER

The Department of Earth and Environmental Sciences at the University of Rochester will be hiring two tenure-track faculty in Solid Earth Processes, in disciplines that include, but are not limited to, Mineralogy/Earth Materials, Petrology, and/or Geochemistry. The rank of the positions is open, with start dates of July 1, 2013 and July 1, 2014. We are interested in dynamic educators and researchers who use geochemical, experimental, and/or computational approaches in their research and can establish externally funded, internationally recognized research programs. Preference will be given to applicants who can build cross-disciplinary programs involving undergraduate and graduate students that complement the University of Rochester's strengths in tectonics, Earth and planetary evolution, geophysics, geochemistry, and climate science (see www.ees.rochester.edu for more information about programs in the Department). We seek applicants who can teach either Mineralogy and/or Petrology/Geochemistry. The University of Rochester is a highly ranked research university, and Rochester's cultural, educational, and recreational assets consistently place the city in the top 10 places to live within the U.S. Applicants should submit materials via: <https://www.rochester.edu/fort/ees/>. Materials include a curriculum vitae, select reprints, statements of research and teaching goals, and the names and contact information of four references. The review of applicants will begin December 15, 2012 and will continue until the position is filled. The University of Rochester has a strong commitment to principles of diversity and, in that spirit, actively encourages applications from groups underrepresented in higher education.

TENURE TRACK FACULTY POSITION GEOMORPHOLOGY/SURFICIAL PROCESSES DEPT. OF GEOLOGY AND GEOGRAPHY AUBURN UNIVERSITY

The Department of Geology and Geography at Auburn University invites applications for a tenure-track Assistant Professor position in the field of Geomorphology/Surficial Processes to begin Fall Semester 2013. Opportunities exist for collaboration with related on-campus programs including units in the College of Sciences and Mathematics, College of Agriculture, College of Engineering, and School of Forestry and Wildlife Sciences.

The successful candidate will be expected to teach at the undergraduate and graduate levels including a geomorphology/surficial processes course as well as general education classes such as Physical Geography, Physical Geology, and/or World Regional Geography and to establish a productive record of independent

research, extramural funding, and publication. A Ph.D. in Geography or related field is required at the time of appointment. Desired qualifications include training in both geology and geography. The candidate selected for this position, which begins August 2013, must meet eligibility requirements to work in the United States on the date the appointment is scheduled to begin and to continue working legally for the term of employment; excellent communication skills are required.

Applicants should submit a letter of application (1–2 pages) describing professional experience, research and teaching interests; a curriculum vitae; copies of all transcripts; and the names and contact information of at least three references.

Applications should be mailed to Search Committee, Dept. of Geology and Geography, 210 Petrie Hall, Auburn University, AL 36849, USA or sent via e-mail to gssearch@auburn.edu.

Applicants are encouraged to visit the AU website to learn more about Auburn University and the Dept. of Geology and Geography (www.auburn.edu/academic/cosam/departments/geology/). Review of applications will begin December 5, 2012, and will continue until the position is filled.

In support of our strategic plan, Auburn University will maintain its strong commitment to diversity with standards to help ensure faculty, staff, and student diversity through recruitment and retention efforts. Auburn University is an Affirmative Action/Equal Opportunity Employer. Women and minorities are encouraged to apply.

ENVIRONMENTAL ENGINEERING WATER RESOURCES FACULTY POSITION MARQUETTE UNIVERSITY

Marquette University (Milwaukee, Wisconsin), Department of Civil, Construction & Environmental Engineering, invites applications for a full-time, tenure-track position in environmental and water resources engineering or science to start August 2013. This is expected to be at the assistant professor level; however, exceptional candidates for higher ranks will also be considered. Candidates in the areas of water quality modeling and management will be considered, with emphasis in watershed ecology, sustainability, engineering, environmental science, hydrology and/or geohydrology. The successful candidate is expected to teach undergraduate and graduate (MS/PhD) courses in his/her area of specialization within environmental and water resources engineering, be committed to student mentoring, and develop a strong, nationally visible, externally funded research program. For more information and to apply see <https://careers.marquette.edu/applicants/Central?quickFind=54008> or contact Dr. Daniel Zitomer, daniel.zitomer@mu.edu, (414) 288-5733.

STRATIGRAPHY FACULTY POSITION UNIVERSITY OF KENTUCKY

The Department of Earth and Environmental Sciences at the University of Kentucky invites applications for the *Pioneer Natural Resources Professor in Stratigraphy* beginning August, 2013. We are anticipating a hire at the assistant professor level (tenure-track), but exceptional candidates at a more senior level will be considered. We seek candidates with field-oriented and/or numerical-modeling expertise in particular. In addition to maintaining a productive

externally funded research program, the new faculty member will teach and mentor at the introductory, major, and graduate levels. The successful individual will have a demonstrated publication record and potential for developing a nationally recognized research program; relevant experience beyond the Ph.D. is desirable. Interested applicants should submit a merged .pdf document to Stratigraphy Search Committee, c/o Dr. Ed Woolery (woolery@uky.edu). The document should include: cover letter, curriculum vitae, brief statements of research and teaching interests, copies of relevant research publications, and contact information for at least three references. We will begin review of applications on December 01, 2012; however, applications will be accepted until the position is filled. The University of Kentucky is an Affirmative Action/Equal Opportunity university that values diversity and is located in an increasingly diverse geographical region. Women, persons with disabilities, and members of other under-represented groups are encouraged to apply. The University also supports family-friendly policies. Additional details of the Dept. of Earth and Environmental Sciences (faculty, research clusters, and facilities) and the University of Kentucky may be viewed at our web pages: www.as.uky.edu/ees and www.uky.edu.

**TENURE-TRACK, APPLIED GEOPHYSICIST,
BAYLOR UNIVERSITY**

Baylor, the world's largest Baptist university, holds a Carnegie classification as a "high-research" institution. Baylor's mission is to educate men and women for worldwide leadership and service by integrating academic excellence and Christian commitment within a caring community. Baylor is actively recruiting new faculty with a strong commitment to the classroom and an equally strong commitment to discovering new knowledge as Baylor aspires to become a top tier research university while reaffirming and deepening its distinctive Christian mission as described in Pro Futuris (www.baylor.edu/profuturis/).

The Dept. of Geology at Baylor University invites applications for a tenure-track Assistant Professor in Applied Geophysics, beginning August 2013. Applicants must hold a Ph.D. in geophysics, physics, or geology with an emphasis in geophysics at the time of appointment. The Department currently consists of 14 geoscientists (www.baylor.edu/Geology/).

Preference will be given to a candidate with a strong background in quantitative sciences whose research interests complement those of existing geophysical strengths in our department. Current strengths include earthquake seismology, potential field methods, geodynamics, and petroleum geology. Research involving processing and interpretation of seismic reflection data, and integrated interpretation with other geophysical and geological data, is desirable, although other research areas in geophysics would be considered. The successful candidate should have the potential to attract external funds and to build a strong research program involving graduate students. The successful candidate should also have the potential to build a vibrant teaching program including graduate and undergraduate courses in geophysics and/or petroleum geology.

Application Process: Send letter of application, including statement of teaching and research inter-

ests, curriculum vitae, copies of transcripts, and the names and contact information for three references to: Dr. Jay Pulliam, Chair, Search Committee, Dept. of Geology, Baylor University, One Bear Place #97354, Waco, TX 76798-7354 (Tel: 254-710-2361; e-mail: Jay_Pulliam@baylor.edu). Applications will be reviewed beginning September 30, 2012 and applications will be accepted until the position is filled. Baylor is a Baptist university affiliated with the Baptist General Convention of Texas. As an Affirmative Action/Equal Opportunity employer, Baylor encourages minorities, women, veterans and persons with disabilities to apply.

**TENURE-TRACK POSITION
ENVIRONMENTAL (LOW TEMPERATURE)
GEOCHEMIST, DEPT. OF GEOLOGICAL
SCIENCES, CALIFORNIA STATE
UNIVERSITY—LONG BEACH**

Assistant or Associate Professor: Rank and salary depend upon qualifications and experiences. Start date: August 19, 2013.

QUALIFICATIONS: Ph.D. in the Geological Sciences or closely related field and record of successful, grant-supported research in environmental geochemistry with focus on low-temperature fluid-solid earth material interaction. Candidate must be able to communicate effectively with an ethnically and culturally diverse campus community and demonstrate potential for excellence in teaching and for developing and sustaining an independent, externally funded research program involving students. Demonstrated excellence in teaching and a record of published research in environmental geochemistry are desired. The successful candidate will utilize the broad range of analytic instrumentation in the Signal Hill Environmental Geochemistry laboratory and the CSULB Institute for Integrated Research in Materials, Environment, and Society.

For further information, see www.csulb.edu/divisions/aa/personnel/jobs/cnsm/.

APPLICATION: Review of applications begins January 14, 2013; position open until filled. Send letter of application, CV, statement of teaching/research goals, and three letters of recommendation directly from referees to: Geological Sciences Search Committee, Dept. of Geological Sciences, California State University, Long Beach, 1250 Bellflower Blvd. Long Beach, CA 90840-3902; Telephone: (562) 985-4809; Email: envgeochem@csulb.edu. *CSULB is an Equal Opportunity Employer.*

**SENIOR-LEVEL FACULTY POSITION
BAYLOR UNIVERSITY**

Baylor, the world's largest Baptist university, holds a Carnegie classification as a "high-research" institution. Baylor's mission is to educate men and women for worldwide leadership and service by integrating academic excellence and Christian commitment within a caring community. Baylor is actively recruiting new faculty with a strong commitment to the classroom and an equally strong commitment to discovering new knowledge as Baylor aspires to become a top tier research university while reaffirming and deepening its distinctive Christian mission as described in Pro Futuris (www.baylor.edu/profuturis/).

The Dept. of Geology at Baylor University is pleased to announce a search for a new faculty posi-

tion for hire with an open starting date beginning in August of 2013, in **Paleoclimatology or Paleoclimate Modeling**. The Department currently consists of 14 geoscientists, including geologists, geophysicists and geographers (please see the Department website at www.baylor.edu/Geology/ for further information).

PALEOCLIMATOLOGY/PALEOCLIMATE MODELING. The Department of Geology at Baylor University invites applications for a Senior Level hire at the rank of Associate to Full Professor, in the general areas of paleoclimatology or paleoclimate modeling, beginning August of 2013. A Ph.D. in Geology, Geochemistry, Biogeochemistry, or related field is required at the time of appointment. The Geology Department seeks an individual with an established, strong research record and a research area that compliments the existing group of 6 tenured and tenure-track faculty members in terrestrial paleoclimatology. Some examples might include biogeochemistry or paleoclimate modeling applied to field and laboratory studies of terrestrial climate records archived within fluvial (river and floodplain), eolian (loess and sand dune), lacustrine (lake), and coastal systems. The individual must be able to communicate and collaborate with Geology faculty members who are currently engaged in studies in the general area of paleoclimatology, and to carry out a vigorous externally funded research program that involves both undergraduate and graduate students. A strong commitment to excellence in teaching is essential, with both undergraduate and graduate courses that might include paleoclimate modeling or biogeochemistry, as well as other courses in his/her area of specialization. Research space for terrestrial paleoclimatology is available in the 500,000-square-foot "state-of-the-art" Baylor Sciences Building, and startup funds associated with this position are highly competitive.

Send letter of application, including statement of teaching and research interests, curriculum vitae, transcripts, and the names and contact information for three references to: Dr. Steven G. Driese, Paleoclimatology Search Committee Chair, Dept. of Geology, Baylor University, One Bear Place #97354, Waco, TX 76798-7354 (Tel: 254-710-2361; applications sent by e-mail to: Steven_Driese@baylor.edu). The review of applications will begin December 1, 2012 and applications will be accepted until the position is filled. Baylor is a Baptist university affiliated with the Baptist General Convention of Texas. As an Affirmative Action/Equal Opportunity employer, Baylor encourages minorities, women, veterans and persons with disabilities to apply

**ASSOCIATE OR FULL PROFESSOR
DEPARTMENT HEAD
GEOLOGY, KANSAS STATE UNIVERSITY**

Earned Ph.D. in geology or closely related earth science discipline, leadership and administrative skills, qualifications consistent with the rank of Associate Professor or higher, including obtaining tenure in the department required, experience obtaining philanthropic gifts preferred, tenured position. Screening of applications begins December 15, 2012 and continues until the position is filled. See the listing at www/k-state.edu/geology/. Contact Richard Marston 785-532-6727.

FELLOWSHIP OPPORTUNITIES

TURNER POSTDOCTORAL FELLOWSHIP, UNIVERSITY OF MICHIGAN

The Department of Earth and Environmental Sciences at the University of Michigan invites applications for the Turner Postdoctoral Fellowship. This highly competitive fellowship is open to all fields within Earth Sciences.

The Department is interested in innovative research proposals that can be pursued in collaboration with a faculty member. Interested applicants are encouraged to contact prospective hosts ahead of the application deadline to discuss areas of common interest and potential collaborations (www.lsa.umich.edu/earth/people/faculty).

Turner Postdoctoral Fellows receive an annual salary of \$55,000, discretionary research funds totaling \$10,000, and a generous benefits package. The fellowship is awarded for a one-year period, with an anticipated extension for a second year.

Interested applicants should send a single pdf file with the following: a curriculum vitae, research proposal (5 pages maximum), and the names and addresses of at least three references no later than January 15, 2013. Applications should be sent to turnerpdf@umich.edu.

The University of Michigan is an affirmative action/equal opportunity employer. Women and minorities are encouraged to apply.

OPPORTUNITIES FOR STUDENTS

MS and Ph.D. Opportunities, Syracuse Univ., Earth Sciences. Seeking applicants for fully funded assistantships in hydrogeology, landscape evolution and computational geophysics, thermochronology, tectonics, geochemistry, paleobiology, and paleoclimatology starting Fall 2013. Opportunities include interdisciplinary collaboration, international fieldwork, and use of extensive state-of-the-art analytical and computing facilities. Visit <http://earthsciences.syr.edu> to apply.

Doctoral Student, Environmental Sciences, Ball State University. The Ball State University Dept. of Geological Sciences is seeking a candidate to admit into the doctoral program in Environmental Sciences. The selected candidate would receive annual tuition remission and a competitive research assistantship renewable for three years. The ideal candidate holds a MS and is a self-starter with experience and ambition to seek external funding. Potential areas of research include: Low-temperature geochemistry, groundwater tracing, and stable-isotopes in karst aquifers of Kentucky; Sediment and nutrient transport in the White River watershed of east-central Indiana; Groundwater/geophysical studies related to the world's largest ground-source geothermal project at BSU.

Interested students should visit the above link for application information and contact Dr. Lee Florea at lflorea@bsu.edu to discuss their interest in the program. The Environmental Sciences Ph.D. Program seeks to attract active, culturally, and academically diverse students of the highest caliber. BSU is an

equal opportunity, affirmative action employer and is strongly and actively committed to diversity within its community.

We are seeking applicants for two 4-year Ph.D. positions in the School of Geology and Geophysics at the University of Oklahoma (Norman, OK). Both positions involve work on an NSF-funded project aimed to investigate sedimentological and geochemical indicators of weathering and climate in modern environments; hence, one position will focus on sedimentology, and one on geochemistry. The students will be funded by a combination of OU teaching assistantships and NSF research assistantships. Applicants should be highly motivated graduate student researchers able to work both independently and in a

team setting, and have the skills necessary to analyze complex data sets. The successful candidates will be expected to contribute to education and outreach activities, present results at scientific conferences, and ultimately publish results in peer-reviewed scientific journals. Requirements: MS in relevant field (e.g., geological and/or chemical sciences). Fieldwork experience in geological sciences and laboratory research experience in geochemistry is desirable. Experience, or willingness to learn quantitative analytical approaches, including statistical analyses. Interested students should email either Dr. Lynn Soreghan (lsoreg@ou.edu) or Dr. Megan Elwood Madden (melwood@ou.edu) by December 1, 2012.



NORTHWESTERN UNIVERSITY

ASSISTANT PROFESSOR - ORGANIC BIOGEOCHEMISTRY

The Department of Earth and Planetary Sciences at Northwestern University invites applications for a tenure track, assistant professor position in organic biogeochemistry to begin in fall 2013. Specifically, we seek a scientist who studies the molecular structure and stable isotope composition of organic materials extracted from modern and ancient sedimentary deposits in order to reconstruct records of past life and the environment, track the evolution and importance of microbial processes through time, and/or study biogeochemical cycles and their role in climate change. The successful candidate is expected to teach both undergraduate and graduate level courses and lead an externally funded research program. A Ph.D. is required at the time of appointment.

Deadline for applications is December 01, 2012. Applicants should visit <http://www.earth.northwestern.edu/> to submit: letter of application, cover letter, curriculum vitae, research and teaching statement, publication list, published papers and names, addresses and e-mails of at least three references.

AA/EOE. Applications from women and members of minority groups are especially welcome.

GSA Environmental & Engineering Geology Division Awards

E.B. Burwell, Jr., Award

Nominations due 1 February 2013

Submit nominations to James McCalpin, GEO-HAZ Consulting, Inc., P.O. Box 837, 600 E. Galena Ave., Crestone, Colorado 81131, USA; mcalpin@geohaz.com

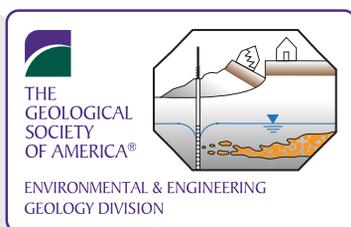
The Edward Burwell, Jr., Award, established by the Division in 1968, honors the memory of one of the founding members of the Division and the first chief geologist of the U.S. Army Corps of Engineers. The award is given to the author or authors of a **published paper of distinction** that advances knowledge concerning principles or practice of engineering geology, or of related fields of applied soil or rock mechanics where the role of geology is emphasized. The paper that receives the award must: (1) deal with engineering geology or a closely related field, and (2) have been published no more than 5 years prior to its selection. There are no restrictions on the publisher or publishing agency of the paper.

Richard H. Jahns Distinguished Lecturer

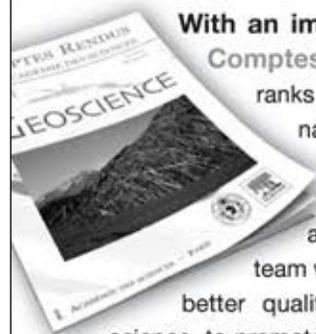
Nominations due 28 February 2013

Submit nominations to Dennis Staley, U.S. Geological Survey, Box 25046, MS 966, Denver, Colorado 80225, USA; dstaley@usgs.gov

The Richard H. Jahns Distinguished Lectureship was established in 1988 by the Environmental & Engineering Geology Division and the Association of Environmental & Engineering Geologists to commemorate Jahns and **to promote student awareness of engineering geology** through an annual series of lectures at academic institutions. The award is given to an individual who, through research or practice, has made outstanding contributions to the advancement of environmental and/or engineering geology. The awardee will speak on topics of earth processes and the consequences of human interaction with these processes, or the application of geology to environmental and/or engineering works. Award funds are administered by the GSA Foundation.



A new editorial policy for *Comptes Rendus Geoscience*



With an impact factor of 1.725, *Comptes Rendus Geoscience* ranks as a prominent international journal for the geosciences. A new editorial team will be in charge as of January 2013. The team wishes to encourage even better quality and more innovative science, to promote a simpler review process and to ensure very rapid publication.

An important new feature is that authors will have their papers reviewed prior to submission. Reviewers will be proposed by the authors and will have to be accepted by the editors following published rules. Since their names will be published, reviewers will commit themselves, a guarantee of quality. Upon receiving the papers and the reviews, an associate editor will decide on accepting or rejecting the paper in less than a month. The paper will be published less than a month after acceptance.

In order to attain these ambitious goals, a compact team of associate editors that cover a broad range of disciplines of the geosciences has been assembled, with Vincent Courtillot as the new Chief Editor, and Associate Editors James Badro (geomaterials), Sylvie Bourquin (sedimentology), Michel Campillo (seismology), Philippe Cardin (geo- and paleomagnetism), François Chabaux (surface geochemistry), Marc Chaussidon (geo- and cosmochemistry), Marguerite Godard (petrology), Amaëlle Landais (stable isotopes and paleoclimates) and Isabelle Manighetti (tectonics).

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Roof of the World

Joint Scientific Meeting of the Geological Society of China and The Geological Society of America

17-19 June 2013

Jinjiang Hotel, Chengdu, Sichuan Province, China

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Prof. Dong Shuwen, Chinese Academy of Geological Sciences, Prof. J.G. Liou, Stanford University

Additional Organizers

Chinese Academy of Geological Sciences
Dept. of Land and Resources of Sichuan Province, China, Chengdu University of Science and Technology

Abstract deadline: 1 March 2013 (abstract submission opens in late December 2012)



www.geosociety.org/meetings/2013china/

Publications Highlights

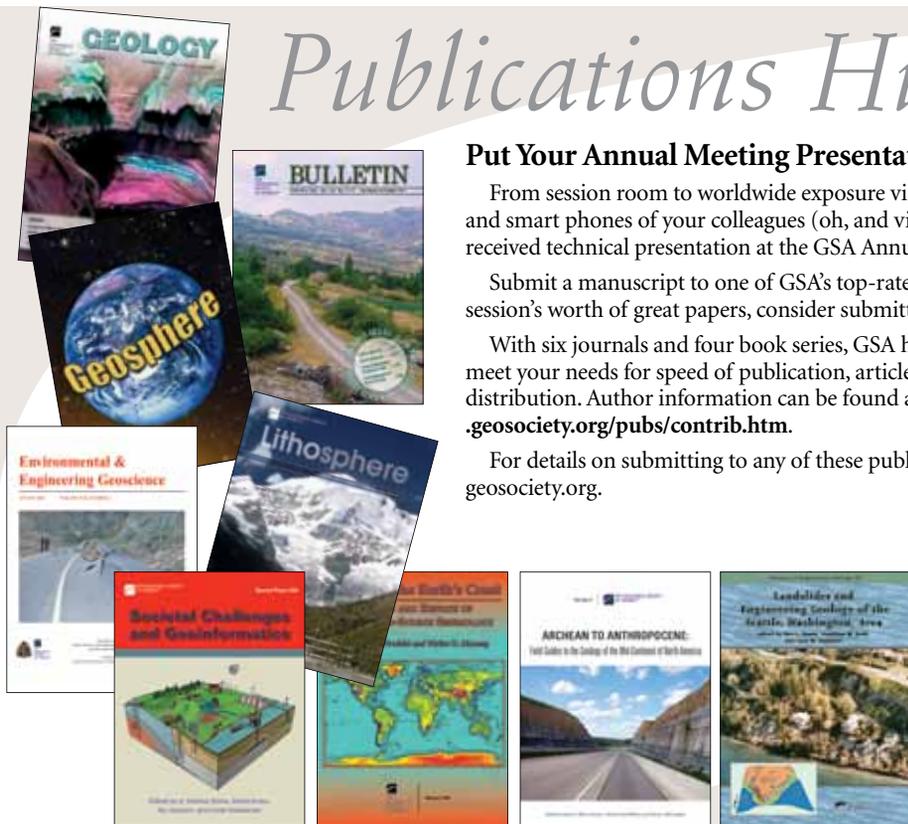
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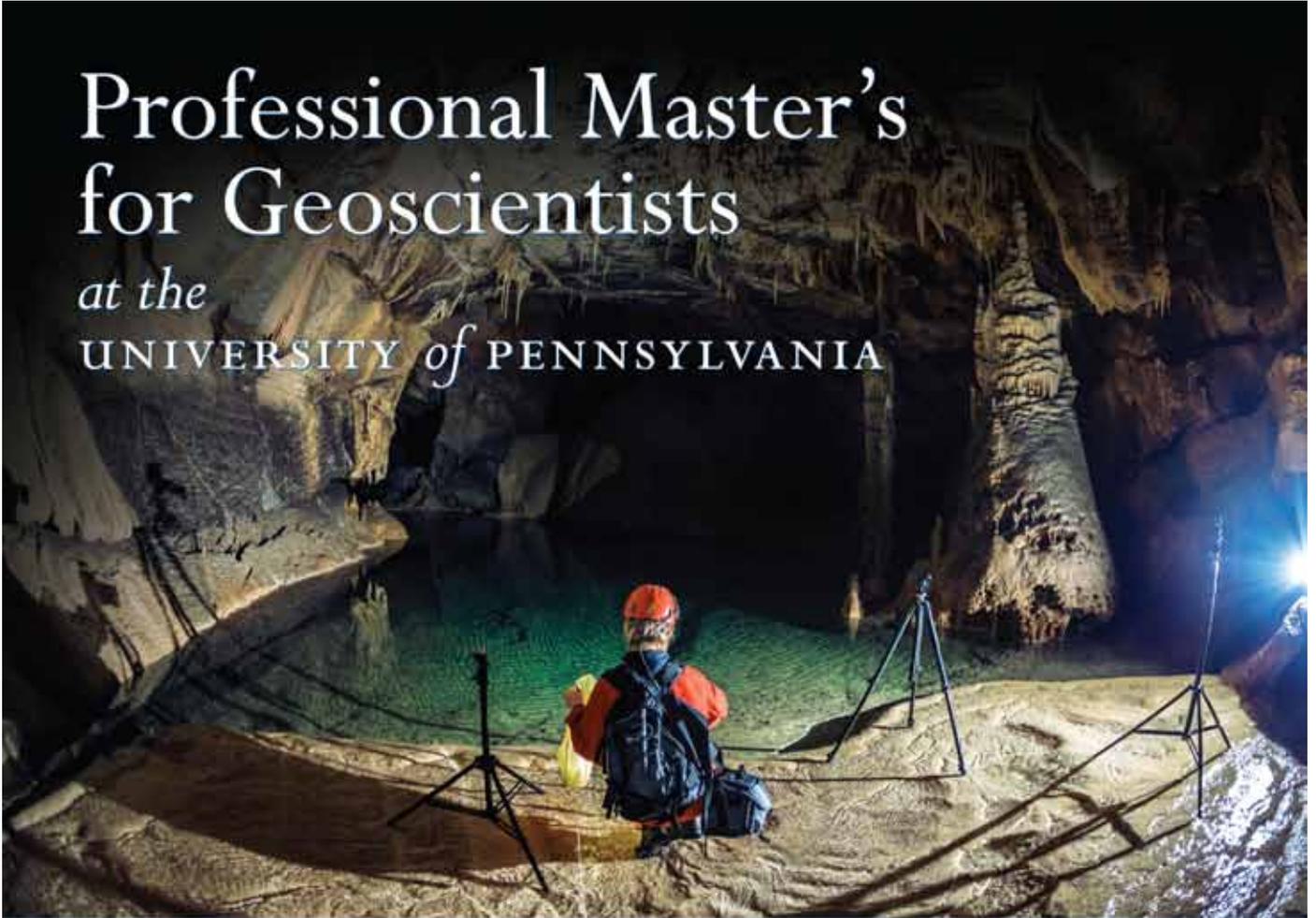
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