

Atlanta Geological Society Newsletter

Next meeting of the Atlanta Geological Society is
March 26, 2013
Fernbank Museum of Natural History (Clifton Road)
Social begins at 6:30 pm – Meeting begins at 7:00 pm

March 2013

ODDS AND ENDS

Ben Bentkowski, Newsletter Editor

The big news this month is the Joint AGS/AEG meeting. There are plenty of details in the column to the right with much more details about the speaker on Page 2. I try to strike a theme in each month's issue but this month I ran across something that really goes back to last month's focus on exogeology. I'll give the details on page 11 but here's a tease that's bound to expand your vocabulary: **cometary panspermia**. And there's supporting SEM photographs!

Big parts of this issue are the links and details about new books published three of our members, Pamela Gore, Bill Witherspoon and Tim Long. Check it out and follow the links.

Here's a question for the membership in general. Pamela Gore has some students that are finishing their degrees and need to be in contact with other geologists to network and look for employment. The question was raised if we had a membership directory, which we don't. In years past we had not had one for privacy reasons. I'd like to raise this to the members. I have a pretty big Excel file that could be useful but I'm concerned about spamming the Members. I'd like to start this dialogue and see what the consensus is.

Ben B, Newsletter Editor

MARCH MEETING

The Atlanta Geological Society and the Association of Environmental and Engineering Geologist are proud to present the Richard H. Jahns Distinguished Lecturer, James P. McAlpin, Ph.D. Dr. McAlpin will speak on March 26, 2013 at the Fernbank Museum located at 767 Clifton Road, Atlanta, GA. Dr. McAlpin will be speaking on **Paleoseismology; Has it Reduced Seismic Hazards, and if not, How Do We Change Course?** Dr. McAlpine was introduced to the "new field" of paleoseismology in 1977 and since has gone on to become a leading expert in this field. The Social will feature an upgrade from our usual fare and start about 6:30 p.m. The lecture will commence at approximately 7:15 p.m.

<http://rock.geosociety.org/egd/Jahns2012-2013.html>

Stacy will be collecting dues of \$25. Dues are due starting on January 1. Please remember to fill out the membership form on the last page of the newsletter.

Additionally, on Saturday January 30th, the PG Study Class at the Fernbank Science Center will feature Ben Bentkowski, P.G. His topic will be borehole geophysics.



James P. McAlpin, Ph.D.

A related project was publication of the reference book *Paleoseismology* in 1996, in collaboration with many early US paleoseismologists. The book won the AEG Holdredge Award in 1999 and the GSA Burwell Award in 2000, and is now in its 2nd edition (in English, 2009; in Russian, 2012). In his 20+ years at GEO-HAZ Dr. McAlpin has completed 140 geologic hazard projects in 40 countries, analyzing seismic and other hazards to developments ranging from residential subdivisions to ski areas, from dams to nuclear power plants.

Since 2001 he has taught a summer field course in neotectonics and paleoseismology, using the only permanent paleoseismic teaching trench in North America. He enjoys collaborating with international earthquake scientists, and especially with their newer generation of students interested in geologic hazards and in geo-constraints to sustainability and quality of life.

Please come out and enjoy Dr. McAlpin's talk: **Paleoseismology; Has it Reduced Seismic Hazards, and if not, How Do We Change Course?**

J.P. McAlpin earned his BA in Geology from University of Texas ('72) and MS from University of Colorado ('75), specializing in geomorphology, Quaternary geology, and rock climbing. He did postgraduate work at University of Alaska, which led to employment in the Alaska Branch of USGS in 1976, and later the Branch of Western Environmental Geology (Menlo Park) in 1977, where he was first introduced to the "new field" of paleoseismology. In 1977 he imported these paleoseismic methods to Colorado and its Rio Grande rift, while mapping and trenching the Sangre de Cristo fault for his PhD at the Colorado School of Mines.

After graduation he served as County Geologist for Jefferson County, Colorado in 1982, and then joined the faculty at Utah State University where he taught geomorphology and engineering geology from 1982-1991. In 1991 he left academia and founded GEO-HAZ Consulting, devoted to applied geological consulting for geologic hazards, primarily seismic and landslide hazards.

POSSIBLE ORIGIN OF GOLD VEINS

Veins of gold, such as this one trapped in quartz and granite, may deposit when the high-pressure water in which they were dissolved suddenly vaporises during an earthquake. Scientists have long known that veins of gold are formed by mineral deposition from hot fluids flowing through cracks deep in Earth's crust. But a study published in *Nature Geoscience* has found that the process can occur almost instantaneously — possibly within a few tenths of a second.

The process takes place along 'fault jogs' — sideways zigzag cracks that connect the main fault lines in rock, says first author Dion Weatherley, a seismologist at the University of Queensland in Brisbane, Australia. When an earthquake hits, the sides of the main fault lines slip along the direction of the fault, rubbing against each other. But the fault jogs simply open up. Weatherley and his co-author, geochemist Richard Henley at the Australian National University in Canberra, wondered what happens to fluids circulating through these fault jogs at the time of the earthquake.

What their calculations revealed was stunning: a rapid depressurization that sees the normal high-pressure conditions deep within Earth drop to pressures close to those we experience at the surface. For example, a magnitude-4 earthquake at a depth of 11 kilometres would cause the pressure in a suddenly opening fault jog to drop from 290 megapascals (MPa) to 0.2 MPa. (By comparison, air pressure at sea level is 0.1 MPa.) "So you're looking at a 1,000-fold reduction in pressure," Weatherley says.

When mineral-laden water at around 390 °C is subjected to that kind of pressure drop, Weatherley says, the liquid rapidly vaporizes and the minerals in the now-supersaturated water crystallize almost instantly — a process that engineers call flash vaporization or flash deposition. The effect, he says, "is sufficiently large that quartz and any of its associated minerals and metals will fall out of solution".

Eventually, more fluid percolates out of the surrounding rocks into the gap, restoring the initial pressure. But that doesn't occur immediately, and so in the interim a single earthquake can produce an instant (albeit tiny) gold vein.

That, Weatherley adds, might be one of the reasons that the rocks in gold-bearing quartz deposits are often marbled with a spider web of tiny gold veins. "You [can] have thousands to hundreds of thousands of small earthquakes per year in a single fault system," he says. "Over the course of hundreds of thousands of years, you have the potential to precipitate very large quantities of gold. Small bits add up."

Nature doi:10.1038/nature.2013.12615

References

Weatherley, D. K. & Henley, R. W. *Nature Geosci.* <http://dx.doi.org/10.1038/ngeo1759> (2013)

<http://www.nature.com/news/earthquakes-make-gold-veins-in-an-instant-1.12615>

GEO LAB

An environmental subsurface investigation and remediation company



Geo Lab is a Woman-owned Small Business offering Drilling, Probing, and Remediation services across the Southeastern United States (AL, FL, GA, MS, NC, SC, TN). We offer our clients a range of services including Environmental and Geotechnical sampling of soil, vapor and groundwater using Direct-Push Technology (DPT) and Hollow-Stem Auger (HSA) systems. Subsurface investigation services including MIP and HPT direct imaging technologies. We provide a range of well installation services using DPT, HSA, DTH Air-Hammer drilling, Mud-rotary and Rock Coring technologies for the installation of monitoring, remediation

system, and injection wells. Remediation services include the direct application of ISCO and Bioremediation materials into the subsurface via injection wells and networks of direct-push injection points. We offer this diversity of services without sacrificing quality, providing highly experienced technicians on every project.

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www.geolab.org

Thanks to our sponsors for their support of this months Joint AGS/AEG meeting. Please consider them for your upcoming field assignments.



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Lawrenceville, Georgia: (Headquarters)

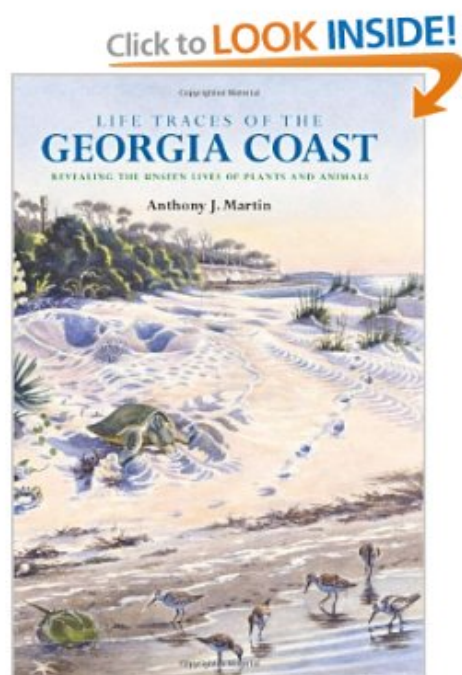
300 Petty Road Suite E

Lawrenceville, Georgia 30043

Telephone: 770.935.4124

Facsimile: 770.935.1624

Email: info@eagleinstruments.com



Life Traces of the Georgia Coast: Revealing the Unseen Lives of Plants and Animals (Life of the Past) [Hardcover]

[Anthony J. Martin](#) (Author)

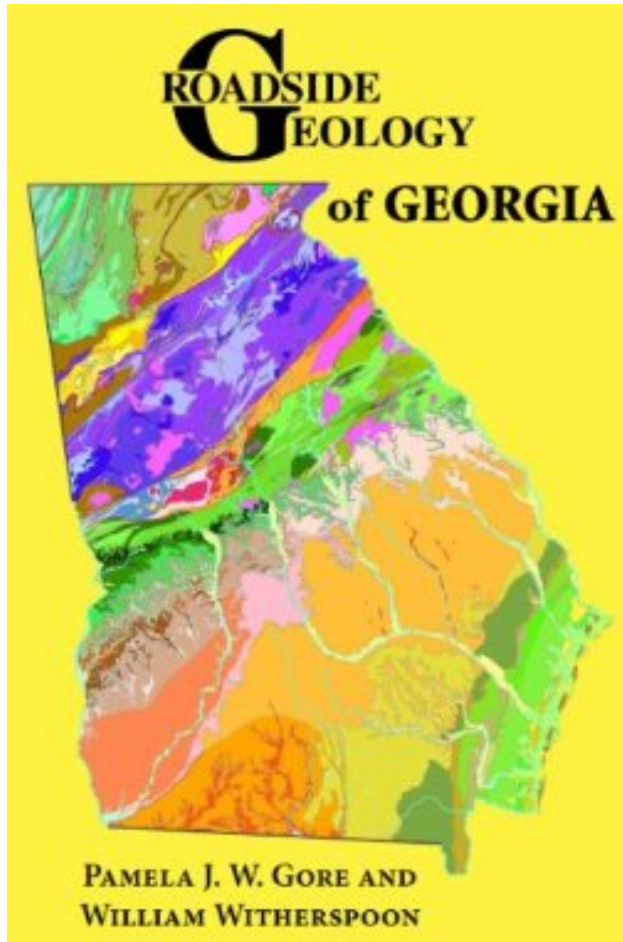
4.0 out of 5 stars [See all reviews \(2 customer reviews\)](#)

Release date: **January 14, 2013** |

ISBN-10: **0253006023** | ISBN-13: **978-0253006028**

Have you ever wondered what left behind those prints and tracks on the seashore, or what made those marks or dug those holes in the dunes? Life Traces of the Georgia Coast is an up-close look at these traces of life and the animals and plants that made them. It tells about the how the tracemakers lived and how they interacted with their environments. This is a book about ichnology (the study of such traces), a wonderful way to learn about the behavior of organisms, living and long extinct. Life Traces presents an overview of the traces left by modern animals and plants in this biologically rich region; shows how life traces relate to the environments, natural history, and behaviors of their tracemakers; and applies that knowledge toward a better understanding of the fossilized traces that ancient life left in the geologic record. Augmented by numerous illustrations of traces made by both ancient and modern organisms, the book shows how ancient trace fossils directly relate to modern traces and tracemakers, among them, insects, grasses, crabs, shorebirds, alligators, and sea turtles. The result is an aesthetically appealing and scientifically accurate book that will serve as both a source book for scientists and for anyone interested in the natural history of the Georgia coast.

http://www.amazon.com/Life-Traces-Georgia-Coast-Revealing/dp/0253006023/ref=sr_1_1?s=books&ie=UTF8&qid=1362573249&sr=1-1&keywords=Anthony+Martin+Georgia+Coast



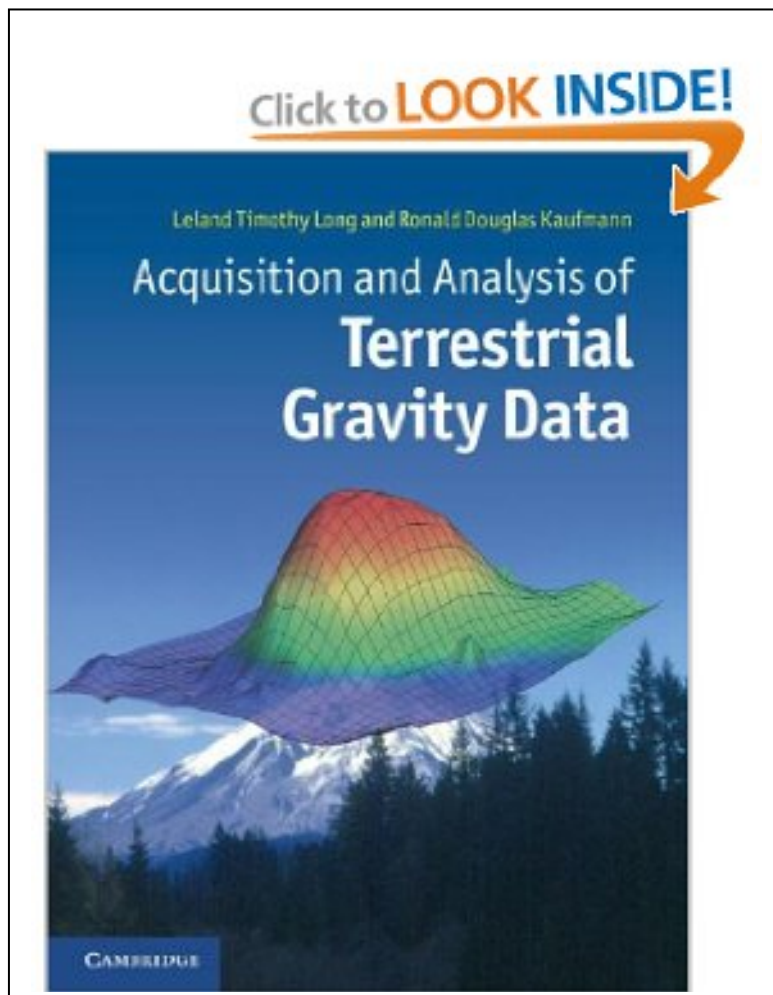
Roadside Geology of
Georgia [Paperback]
[Pamela J. Gore](#)
[William](#)
[Witherspoon](#)

http://www.amazon.com/Roadside-Geology-Georgia-Pamela-Gore/dp/0878426027/ref=sr_1_1?s=books&ie=UTF8&qid=1362572960&sr=1-1&keywords=Pamela+Gore

Ride along with geologists Pamela Gore and Bill Witherspoon on this extraordinary tour of the Peach State's varied terrain. In 35 detailed and densely illustrated road guides, the authors examine Georgia's fascinating geology and reveal the stories that lie beneath the surface.

You'll be amazed at Georgia's geological diversity, from its shifting barrier islands along the coast to the sandstone ridges in its northwest corner. At the Cumberland Island National Seashore you'll find the ruins of Dungeness, the once-magnificent Carnegie estate built of local mineral resources, and encounter wild horses grazing among windswept dunes. In Atlanta, the white whaleback of granite called Stone Mountain will impress you with its protruding cat's paw minerals and stony layers that are sloughing off like the layers of an onion. In the Blue Ridge Mountains you can witness Amicalola Falls, one of the highest cascading waterfalls east of the Mississippi River, and Tallulah Gorge, one of the deepest gorges in the eastern United States. And in the iconic Okefenokee Swamp of south Georgia, you'll wade through the gator-filled blackwater of one of the largest wetlands in North America.

With its engaging prose and 250-plus color photos, maps, and figures, *Roadside Geology of Georgia* takes you beyond the rocks to unearth the billion-year history of the Empire State of the South



Acquisition and Analysis of Terrestrial Gravity Data [Hardcover]

[Professor Leland Timothy Long,](#)
[Ronald Douglas Kaufmann](#)

http://www.amazon.com/Acquisition-Analysis-Terrestrial-Gravity-Data/dp/1107024137/ref=sr_1_4?s=books&ie=UTF8&qid=1362573154&sr=1-4&keywords=Leland+Long

Gravity surveys have a huge range of applications, indicating density variations in the subsurface and identifying man-made structures, local changes of rock type or even deep-seated structures at the crust/mantle boundary. This important one-stop book combines an introductory manual of practical procedures with a full explanation of analysis techniques, enabling students, geophysicists, geologists and engineers to understand the methodology, applications and limitations of a gravity survey. Filled with examples from a wide variety of acquisition problems, the book instructs students in avoiding common mistakes and misconceptions. It explores the increasing near-surface geophysical applications being opened up by improvements in instrumentation and provides more advance-level material as a useful introduction to potential theory. This is a key text for graduate students of geophysics and for professionals using gravity surveys, from civil engineers and archaeologists to oil and mineral prospectors and geophysicists seeking to learn more about the Earth's deep interior

BENEFITS OF AN AGS MEMBERSHIP

- Location – AGS meets at the Fernbank Museum of Natural History, which is a truly awesome facility central to most of our membership.
- Cost – AGS membership (\$25 general; \$10 student) is the most inexpensive for any geological society in the SE.
- Active – AGS holds nine lectures a year and is one of the most active geological societies in the SE.
- AEG – For one of our lectures, AGS co-sponsors with the Association of Environmental & Engineering Geologists to annually present the “Richard H. Jahns Distinguished Lecturer” while in Atlanta.
- PDH – AGS is recognized by Alabama, South Carolina, and other professional state boards to provide Professional Development Hours for our lectures, as well as field trips and workshops.
- PG Classes – AGS offers nearly monthly Professional Geologist development training classes in preparation for passing the ASBOG examinations and has been recognized by the Georgia State Geologist as enhancing PG test scores for participants.
- Free Food – AGS offers free pizza and Coke at all of our regular meetings, sandwiches and hors d’oeuvres at the Jahns lecture, and a sit-down BBQ dinner at our June social.
- IMAX – As part of the June social, AGS and Fernbank present a free IMAX movie.
- Networking – AGS meetings include professionals, academics, regulators, and others who all share the same interest in geological sciences.
- Resume – AGS membership and even involvement in one of our many committees will enhance any resume.

Annual membership dues for the Atlanta Geological Society are \$25 for professional membership, \$10 for students, and \$100 for corporate sponsorship (which includes up to 4 professional memberships). Please complete the [application form](#) and submit with your payment to the AGS Treasurer. For further details about membership, please contact the AGS Membership Chairman – Ben Bentkowski

cell -770-296-2529 BBENTKOW@gmail.com

Legislation of interest to the AGS

2013-2014 Regular Session - SB 176, HB 357

Waste Management; hazardous waste sites; enrollment, participation, administration; revise provisions

These bills were last acted on in mid-February and could impact the State's HSRA regulations. I'll leave the legal interpretations to others but I do note that both bills include the requirement for involvement of a registered professional geologist or engineer. Another reason to go to those Saturday classes! Also, they spell groundwater as two words. BB Newsletter Editor

SECTION 3.

42 Said chapter is further amended in Code Section 12-8-102, relating to definitions relative to
43 the Georgia Voluntary Remediation Program, by adding a new paragraph to subsection (b)
44 to read as follows:

45 "(13.1) 'Registered professional' means any person who:

46 (A) Has a minimum of eight years' experience in the investigation and remediation of
47 releases of regulated substances, including a minimum of four years as the person in
48 responsible charge of the investigation and remediation of such releases;

49 (B) Holds a bachelor's or advanced degree from an accredited college or university in
50 a related environmental science, engineering, or geology field; and

51 (C) Is a professional engineer or professional geologist registered with the State Board
52 of Registration for Professional Engineers and Land Surveyors or the State Board of
53 Registration for Geologists."

From: Luke Patterson <lukep@lpeng.com<mailto:lukep@lpeng.com>>

Subject: Alabama UST Work

Date: March 14, 2013 2:19:47 PM CDT

I noticed your AGS website and thought I would send you all an email about a position we had open.

We are looking for someone to hire in Alabama that is familiar with ADEM UST work (specifically Leaking UST sites).

We would prefer them to be registered as a geologist or engineer in Alabama but we'd look really hard at anyone with a good background in UST.

If you know or hear of anyone in this field looking for work, feel free to pass along my contact or ask them to email me their resume.

Thanks,

Luke G. Patterson, P.E.

LP Environmental, LLC

4701 Trousdale Drive

Nashville, TN 37220

[615-457-3308](tel:615-457-3308)

Astrobiologists Find Ancient Fossils in Fireball Fragments

<http://www.technologyreview.com/view/512381/astrobiologists-find-ancient-fossils-in-fireball-fragments/>

Algae-like structures inside a Sri Lankan meteorite are clear evidence of panspermia, the idea that life exists throughout the universe, say astrobiologists. On 29 December 2012, a fireball lit up the early evening skies over the Sri Lankan province of Polonnaruwa. Hot, sparkling fragments of the fireball rained down across the countryside and witnesses reported the strong odour of tar or asphalt.

Over the next few days, the local police gathered numerous examples of these stones and sent them to the Sri Lankan Medical Research Institute of the Ministry of Health in Colombo. After noticing curious features inside these stones, officials forwarded the samples to a team of astrobiologists at Cardiff University in the UK for further analysis.

The results of these tests, which the Cardiff team reveal today, are extraordinary. They say the stones contain fossilised biological structures fused into the rock matrix and that their tests clearly rule out the possibility of terrestrial contamination.

The general properties of these three stones immediately mark them out as unusual. One stone, for example, had a density of less than 1 gram per cubic centimetre, less than all known carbonaceous meteorites. It had a partially fused crust, good evidence of atmospheric heating, a carbon content of up to 4 per cent and contained an abundance of organic compounds with a high molecular weight, which is not unknown in meteorites. On this evidence, Wallis and co think the fireball was probably a small comet.

The most startling claims, however, are based on electron microscope images of structures within the stones (see above). Wallis and co. say that one image shows a complex, thick-walled, carbon-rich microfossil about 100 micrometres across that bares similarities with a group of largely extinct marine dinoflagellate algae.

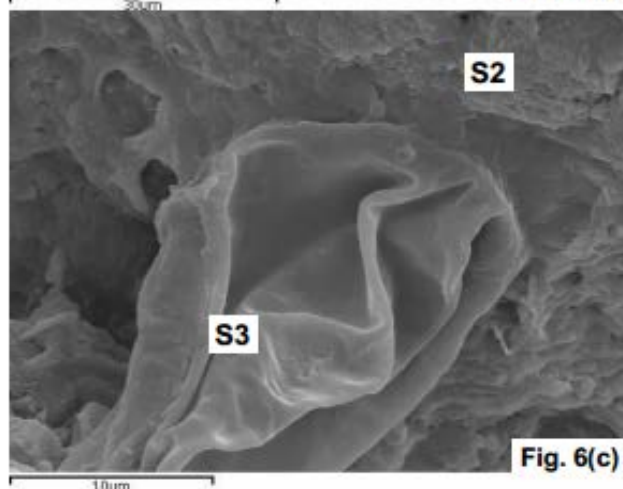
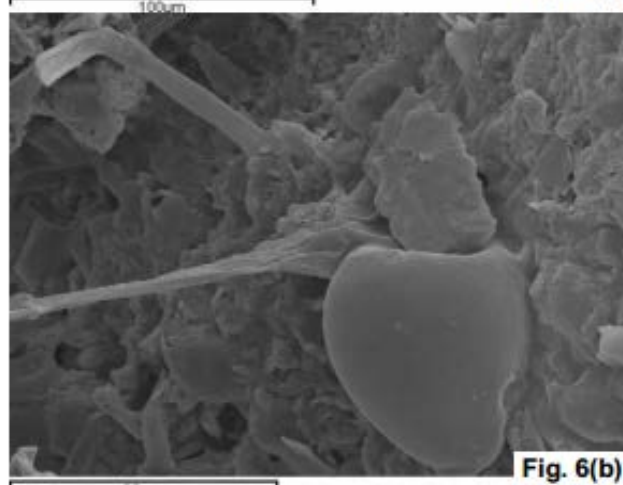
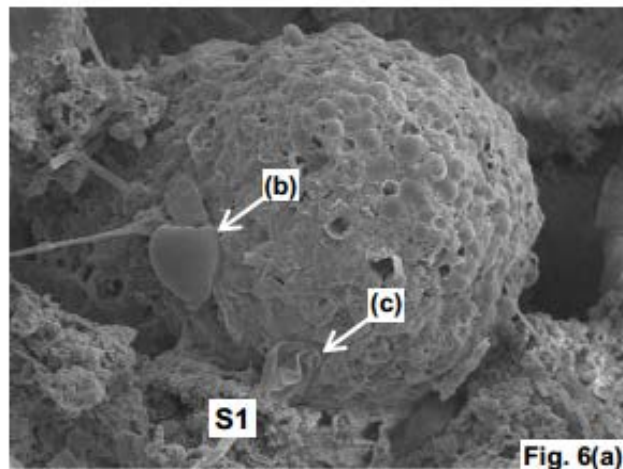
They say another image shows well-preserved flagella that are 2 micrometres in diameter and 100 micrometres long. By terrestrial standards, that's extremely long and thin, which Wallis and co. interpret as evidence of formation in a low-gravity, low-pressure environment.

Wallis and co. also measured the abundance of various elements in the samples to determine their origin. They say that low levels of nitrogen in particular rule out the possibility of contamination by modern organisms which would have a much higher nitrogen content. The fact that these samples are also buried within the rock matrix is further evidence, they say.

Wallis and co. are convinced that the lines of evidence they have gathered are powerful and persuasive. "This provides clear and convincing evidence that these obviously ancient remains of extinct marine algae found embedded in the Polonnaruwa meteorite are indigenous to the stones and not the result of post-arrival microbial contaminants," they conclude.

There's no question that a claim of this kind is likely to generate controversy. Critics have already pointed out that the stones could have been formed by lightning strikes on Earth although Wallis and co. counter by saying there was no evidence of lightning at the time of the fireball and that in any case, the stones do not bear the usual characteristics of this kind of strike. What's more, the temperatures generated by lightning would have destroyed any biological content.

Astrobiologists Find Ancient Fossils in Fireball Fragments (cont)



Panspermia (Greek: πανσπερμία from πᾶς/πᾶν (*pas/pan*) "all" and σπέρμα (*sperma*) "seed") is the [hypothesis](#) that [life](#) exists throughout the [Universe](#), distributed by [meteoroids](#), [asteroids](#) and [planetoids](#) Continued on Page 14.

Nevertheless, extraordinary claims require extraordinary evidence and Wallis and co. will need to make their samples and evidence available to the scientific community for further study before the claims will be taken seriously.

If the paper is taken at face value, one obvious question that arises is where these samples came from. Wallis and c.o have their own ideas: "The presence of fossilized biological structures provides compelling evidence in support of the theory of cometary panspermia first proposed over thirty years ago," they say.

This is an idea put forward by Fred Hoyle and Chandra Wickramasinghe, the latter being a member of the team who has carried out this analysis.

There are other explanations, of course. One is that the fireball was of terrestrial origin, a remnant of one of the many asteroid impacts in Earth's history that that have ejected billions of tonnes of rock and water into space, presumably with biological material inside. Another is that the structures are not biological and have a different explanation.

Either way, considerably more work will have to be done before the claims from this team can be broadly accepted. Exciting times ahead!

Ref: <http://arxiv.org/abs/1303.1845>

The Polonnaruwa Meteorite: Oxygen isotope, Crystalline and Biological Composition

AGS PG Candidate Workshop

Date: Saturday, March 30, 2013

Time: 10:00 am until 12:00 pm

Place: Fernbank Science Center
156 Heaton Park Drive, NE
Atlanta, Georgia 30307
<http://fsc.fernbank.edu/>
[678-874-7102](tel:678-874-7102)

Subject: Borehole Geophysics

Lecturer: Ben Bentkowski, PG

The March 2013 Atlanta Geological Society PG Candidate Workshop will feature Ben Bentkowski, P.G. leading a class on engineering geology. Mr. Bentkowski will hold a class on several methods of investigating boreholes including: caliper, temperature, gamma ray, conductivity, SP, borehole flow, etc. He recently spent a week testing a series of 14 boreholes in Texas. Borehole geophysics is central to subsurface geological investigations.

Ben works for EPA as a hydrogeologist providing technical support to groundwater investigations and remedies throughout Region 4. He earned a B.S at Florida Atlantic University and M.S at Oklahoma State University, both in Geology and previously worked seven years in petroleum exploration. The last 26 years have been focused on contaminant hydrogeology at sites throughout the Southeastern US for EPA.

Please join us and feel free to forward this announcement to anyone that might be interested. Borehole geophysics is covered on the licensure exams.

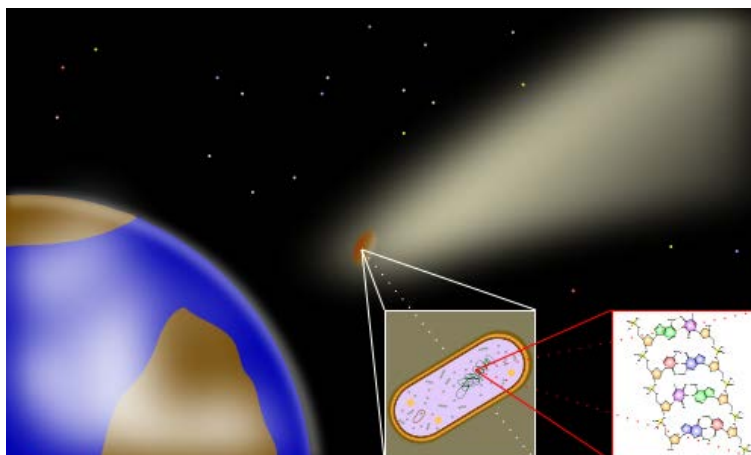
Two Professional Development Hours will be offered and everyone is invited to attend. AGS Membership is not required. Go to our web site (atlantageologicalsociety.org) or Facebook page for more info. The classes are open to all, membership in the AGS is not required, but for \$25 per year (\$10 for students) it is quite a bargain! Please consider joining. The AGS is one of the most active geological organizations in the Southeast.

AGS Professional Registration Committee
Atlanta Geological Society

Ken Simonton, P.G. kws876@gmail.com
John Salvino, P.G. johnsalvino@bellsouth.net

Cometary Panspermia

The concept that life or evidence of life from beyond Earth can be or was transported here onboard a comet.



Panspermia proposes that life forms that can survive the effects of space, such as [extremophiles](#), become trapped in debris that is ejected into space after collisions between planets that harbor life and [Small Solar System Bodies](#) (SSSB). Bacteria may travel dormant for an extended amount of time before colliding randomly with other planets or intermingling with [protoplanetary disks](#). If met with ideal conditions on a new planet's surfaces, the bacteria become active and the process of [evolution](#) begins

AGS Members... Geology Enthusiasts Needed!!

If you are an AGS member and would like to contribute to the Professional Registration Committee by leading a lecture on one of the subjects listed below, then please contact me either by e-mail or at the monthly AGS meetings. The lecture should be for one hour followed by a Q&A session. We need different speakers for each workshop. Your volunteering to teach on one of these subjects is essential to the success of the Professional Registration Committee – we need more widespread participation by the AGS membership. Speakers can be compensated for expenses and will receive certificates to acknowledge their participation.

The following content domains are covered in the Georgia Professional Geologist exams:

- | | |
|-------------------------------------------------------------|-------------------------------------------|
| A. General Geology | B. Mineralogy, Petrology, & Petrography |
| C. Sedimentology, Stratigraphy, & Paleontology | D. Economic Geology & Energy Resources |
| E. Structure, Tectonics, & Seismology | F. Hydrology & Environmental Geochemistry |
| G. Engineering Geology | |
| H. Quaternary Geology, Geomorphology, & Surficial Processes | |

We do not "teach the test" our aim is to review fundamental concepts of the earth sciences and acquaint candidates with industry specific information not easily obtainable from the literature. Please inform anyone who might be interested in becoming a professional geologist of our workshop. Please consider joining us even if you are not a P.G. candidate. The workshops are interesting and informative.

Ken Simonton, P.G., Chair
 John Salvino, P.G.
 Professional Registration Committee

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FERNBANK MUSEUM

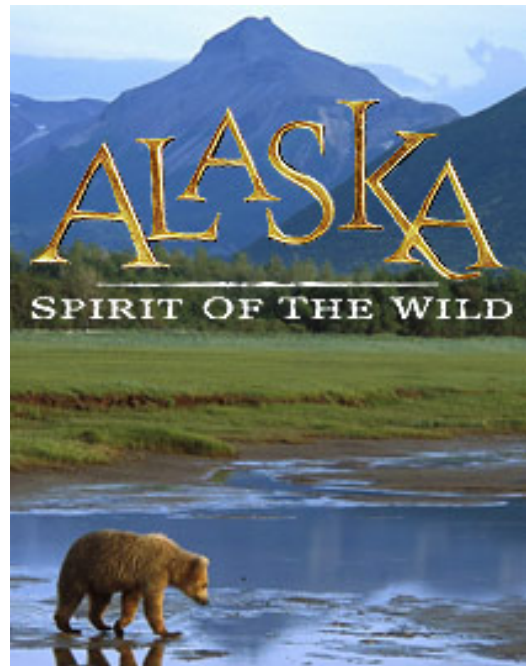
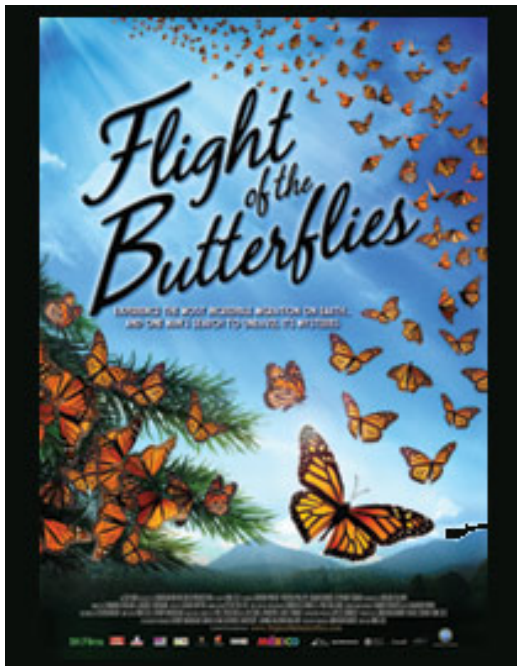
of NATURAL HISTORY

Fernbank Museum of Natural History

Upcoming Public Programs and Events

(All programs require reservations, including free programs)

Now Showing in the Fernbank IMAX movie theater:



[Flight of the Butterflies](#) Now showing through May 9, 2013

Enter the enchanting world of monarch butterflies, interweaving the story of their annual migration with the moving human story of the decades-long search for their winter home. Soar a mile high alongside one of the greatest spectacles of the natural world, as half a billion Monarch butterflies head south on an epic three thousand mile journey.

[Alaska: Spirit of the Wild](#) Now showing through March 28, 2013 **CLOSING VERY SOON!!!**

Experience the ultimate story of survival, where life triumphs season after season against fierce conditions and challenges. Witness the spirit of the wild in the thundering stampede of the caribou, the beauty of the polar bear, and the deadly hunt of the wolf pack. This film is about the majesty and uniqueness of wild Alaska, and about the resiliency of life itself.

Titans of the Ice Age Showing March 29 – August 15, 2013

Fernbank Museum of Natural History

767 Clifton Rd, NE, Atlanta, GA 404-929-6400

Special Exhibits On View: <http://www.fernbankmuseum.org/explore-exhibits/special-exhibitions>



Extreme Mammals Opened March 2, 2013

Examine some of the oddest and most intriguing animals of all time in ***Extreme Mammals: The Biggest, Smallest, and Most Amazing Mammals of All Time.***

From the speedy to the slothful, the towering to the tiny, and the furry to the armor-clad, come nose-to-snout with an amazing array of extraordinary critters. Stand beneath the largest land mammal that ever lived, and peek at a creature so small that it weighed no more than a dollar bill!

Tickets for ***Extreme Mammals*** are included with Museum admission and are [free for members](#). ***Extreme Mammals*** is sponsored locally in part by The Isdell Family.

For tickets and details on exhibits, films, and events, please visit the website at www.fernbankmuseum.org Follow us on Facebook or Twitter for the latest news and updates! Please see the website for details about Martinis and IMAX on Friday nights.

The mysterious announcement set for November 16 was the launch of the new Fernbank Meridian app. Based upon the Apple OS, this app works in conjunction with the free in the building wi-fi to provide more detailed information about the permanent exhibits, the new exhibits and IMAX schedules. Also it utilizes an indoor-location awareness technology to provide turn-by-turn directions to visitors. A quick and easy way to find an exhibit, restroom or vending machine. All aimed at making your visit to the Fernbank more informative and enjoyable.

AGS Officers

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Treasurer: Stacey Durden-Phillips

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AGS 2013 Meeting Dates

Listed below are the planned meeting dates for 2013. Please mark your calendar and make plans to attend.

March 26 The combined AGS/AEG meeting with the Jahns Lecturer, James McCalpin, president of GEOHAZ Consulting in applied geological consulting for geologic hazards, primarily seismic and landslide hazards. The topic of the lecture has not yet been selected.

PG Study Class March 30 , Ben Bentkowski, P.G., speaking on Borehole Geophysics

April 30 TBD

May 28 TBD

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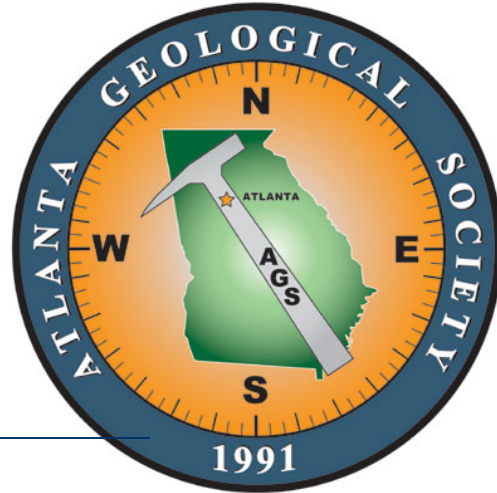
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STUDENT \$10

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For further details, contact the AGS Treasurer: stacy.durden@gmail.com.

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