

# Inland Geological Society

June 2017

Newsletter of the Inland Geological Society

Volume 33 No. 6

Next Meeting:  
**Wednesday**  
**June 7<sup>th</sup>**

Time:  
**Social: 6:00pm**  
**Dinner: 7:00pm**  
**Lecture: 7:45pm**

Location:  
**LSA Associates**  
**1500 Iowa Ave**  
**Suite 200**  
**Riverside, CA**  
**92507**  
**(Map on Pg. 6)**

Coming to  
Dinner?  
**Please RSVP**  
**by Monday 6/5**  
**(951) 232-0430**  
**rkolenko90@gmail.com**

## In this issue:

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## June Speakers:

This month we will be fortunate to hear from three students from Riverside City College who are currently engaged in internships at UC Riverside.

**Jose Lara**  
Student, Riverside City College

## **Ethiopian Afar Mantle Plume Composition**

### **Abstract:**

Geophysical observations of the mantle in Ethiopia clearly show the presence of a mantle plume, called the Afar plume, and it is possible that this plume is sourced from the core-mantle boundary. One common attribute of mantle plumes is that they are warmer than the typical mantle, and this temperature anomaly drives their buoyancy and ability to rise in the mantle from great depths. However, the composition of volcanic rocks in Ethiopia suggest that the Afar plume is not significantly warmer than the typical mantle, and there is uncertainty as to what else could drive the buoyant rise of the Afar plume. One hypothesis is that the Afar plume has elevated water and carbon dioxide contents, both of which could drive the mantle plume to rise to the surface and generate the significant geophysical anomaly observed in the Ethiopian mantle. We are testing this hypothesis by measuring the concentrations of water and carbon dioxide in basaltic glasses from the Gulf of Aden via Fourier transform infrared (FTIR) spectroscopy in the Brounce Spectroscopy Laboratory at the University of California, Riverside. By measuring the water and carbon dioxide contents of these samples, we will be able to tell if the amounts in the glasses increase as they approach Ethiopia, and thus the Afar plume, beginning from the mouth of the Gulf of Aden to the Afar region of Ethiopia. Once the amount of water and carbon dioxide is quantified in each glass sample, we will plot the data on a map and document any correlation between the glasses' proximity to the Afar plume with water and carbon dioxide contents, thus constraining a lower limit.

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**June Speakers:**

(continued from p. 1)

**Jose Lara**  
Student, Riverside City College

***Biography:***

Jose is currently attending Riverside City College to complete prerequisite courses for a geology major. He intends to apply to UC Riverside in the fall. His favorite outdoor activity is hiking, which he would compete in if it were a competitive sport. He is also an avid photographer and has the beginnings of a respectable shoebox rock collection.

**Astrid Garcia**  
Student, Riverside City College

## **Inverse Modelling for Worldwide Earthquakes**

***Abstract:***

Inverse models for global earthquakes are produced using data collected by Sentinel-1 TOPS InSAR (Interferometric Synthetic Aperture Radar). An inverse model uses the data to retrieve parameters such as strike, dip, rake, and slip using the nonlinear inversion algorithm OKINV 3.16. These models are of interest because they provide pertinent information about the earthquakes; in addition, since there are data uncertainties, that data is masked out and through the inversion process a large model space is searched for an appropriate model with a small misfit. The first step in producing these models is to process the data collected by Sentinel-1 into interferograms, which are patterns formed by wave interference. The coherence of each interferogram depends on atmospheric noise, the presence of aftershock earthquakes, and vegetation density, which all affect the signal. Once an earthquake is clearly identified, the inverse earthquake modelling process can begin. Thus far, inverse models have been produced for earthquakes that have occurred near Huarichancara, Peru; Machaze, Mozambique; Sary-Tash, Kyrgyzstan; and Yilkiqi, China. There are other earthquakes currently in the process of being modelled. Radar cannot obtain precise readings that penetrate deep into earth's surface and the earthquakes needed to be onshore so that data could be gathered. Therefore, earthquakes chosen for modelling were located onshore worldwide, had a depth less than approximately twenty kilometers, and were of about magnitude five through seven. Background details on each earthquake are also being gathered, including the number of casualties and any infrastructure damage. Ultimately, the information acquired from inverse earthquake modelling contributes to the further development of SAR technology. The data processed will be presented at a workshop in Helsinki, Finland later this year.

***Biography:***

Astrid has a considerable fascination with the science of her planet. She has multiple geology-related interests which range from hiking and rock hounding to making pottery. She is transferring to UC Riverside in the fall of this year to complete a bachelor of science degree in geology. Currently, Astrid is assisting UC Riverside Associate Professor Gareth Funning in compiling inverse models for earthquakes around the globe.

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**June Speakers:**

*(continued from p. 2)*

**Hunter Steinmuller**  
Student, Riverside City College

**(Topic to Be Announced)**

***Biography:***

Hunter is a geology major interested in geomorphology. He will be transferring to UC Riverside in the Fall of 2018. Hunter works as a kiln tech for a ceramics studio and also creates pottery. He enjoys cycling and hiking.

***Many Thanks!***

This year IGS has had a large turn-over in board membership as those serving have gone on to new pursuits. At this time, we would like to express our heartfelt thanks to those members who have volunteered their time and talents to serve as Officers of the Inland Geological Society.

**RETIRING BOARD MEMBERS:**

- Rob Johnson**, Co-President
- Crystal Bair**, Secretary
- Steve Mains**, Membership Chairman
- Shelby Barker**, Newsletter Editor
- Marina West**, Web Mistress
- Ernie Roumelis**, Web Master

We appreciate all you have done to make IGS a great organization and professional resource and wish you the best in your future endeavors!

Due to the need for an immediate replacement to fill the position of Secretary, Rachel Kolenko has been approved by the board without a membership vote. Her name will appear on the ballot at the end of the year for membership ratification. Other appointments include Kirby Roucher as Membership Chairman and Scott Orton as Web Master.

## Announcements

### Latest Preliminary Alquist-Priolo Maps from California Geological Survey

The California Geological Survey recently issued, on December 15, 2016, preliminary AP maps for the **Los Angeles, Mount Wilson and El Monte quadrangles**. These are likely to be adjusted over the coming months as practitioners and specialists chime in. But for now they are the basis for where fault studies need to be conducted along the Raymond fault zone. According to our correspondence with City of Los Angeles geotechnical reviewers, these state maps take precedence and supersede city maps. It appears the much-anticipated AP Map for the **Beverly Hills quadrangle** is in its final stages of development for use as a basis of geologic and geotechnical studies in west Los Angeles. Stay tuned for updates and check in with the CGS website. Follow the link to download the maps, now available free online: <http://www.conservation.ca.gov/cgs/rghm/ap>.

### Invitation to Submit Photos

#### Do you have an interesting photo to share?

IGS would like to begin publishing photographs submitted by members of **geologic localities or items of interest**. Subjects may include field site geology, field trip localities, mineral specimens, water issues, etc. Be creative! Photos must be your own work product. Submit your exemplary photo with your name, the approximate date and location, and a short (paragraph) description of the photo to any IGS board member for consideration for publication in an upcoming newsletter.

### Links to Publications

Each month, Greg Johnson brings published articles to the IGS meeting which may be of interest to members. Selected articles can be accessed in electronic form at <ftp://dpwftp.co.la.ca.us/pub/GMED/geology/NGWA/>.

Thanks, Greg, for making these articles available!

### For Those Working on Residential/Commercial Development in Los Angeles County

The Geotechnical and Materials Engineering Division (GMED) of the County of Los Angeles Department of Public Works is now accepting Building and Grading permit application document submittals through a web application at the following URL: <https://dpw.lacounty.gov/apps/esubmissions/gme/default.aspx>. Permit applications must be filed with Building and Safety before documents can be submitted to GMED because a plan check application number must be provided on the upload screen. First-time users are required to create a site login, which facilitates future submittals and provides contact information should it be determined that additional information is needed to process the submittal. Documents submitted through the web portal include consultant's reports, building/grading plans, permit applications, fee receipts, etc., and must be in Adobe PDF format. Submittal of hard copy (paper) documents to GMED is no longer required. The web application will not accept plan check application numbers for applications filed through Land Development Division and some Contract Cities.

For information on submitting these projects, or for any other questions, please contact GMED at [GMEDSubmittals@dpw.lacounty.gov](mailto:GMEDSubmittals@dpw.lacounty.gov), or (626) 458-4923.

### BPELSG Has TAC Vacancies

The California Board for Professional Engineers, Land Surveyors and Geologists (BPELSG) is currently accepting applications to fill vacancies on its Geology and Geophysicist Technical Advisory Committees (TACs). Please visit their website for more information at [www.bpelsg.ca.gov](http://www.bpelsg.ca.gov), or contact Laurie Racca at [Laurie.Racca@dca.ca.gov](mailto:Laurie.Racca@dca.ca.gov) or (916) 263-2406.

## Upcoming Meetings/Events

### Inland Geological Society

The Inland Geological Society typically meets the first Wednesday or Thursday of each month. We will take hiatus in July to accommodate the Independence Day holiday. Watch for the August newsletter for information about our next meeting. For more information, visit our website at [www.inlandgeo.org](http://www.inlandgeo.org).

### South Coast Geological Society



Monthly dinner meetings are typically the 1st Monday of the month at The Hilton DoubleTree Hotel, 7 Hutton Centre Drive, Santa Ana. On Monday, June 5th, Robert Leeper, PhD candidate at UC Riverside, will present "*Newly identified seismic hazards along the Newport-Inglewood fault zone: Evidence for repeated late Holocene coseismic subsidence events in the Seal Beach saltmarsh.*" For more information, visit the association website at [www.southcoastgeo.org](http://www.southcoastgeo.org).

### AEG—Southern California Section



On Tuesday, June 13th, AEGSC and ASCE will co-host a joint meeting at Stevens' Steak and Seafood in Commerce. William Kane will present "*Mitigating Debris Flow Hazards on California Hillsides.*" For more information, visit the association website at [www.aegsc.org](http://www.aegsc.org).

### AEG—Inland Empire Chapter



Monthly dinner meetings are typically the third Wednesday of the month at Pinnacle Peak Steakhouse, 2533 S. La Cadena Drive, Colton. On Wednesday, June 21st, Dr. Jonathan C. Matti, Geologist with the US Geological Survey, will present "*San Geronio Pass — Where It All Comes Together.*" Cost: \$10 for students with current ID, \$25 with reservation, or \$30 at the door. For more information, visit the association website at [www.aegsc.org/chapters/inlandempire](http://www.aegsc.org/chapters/inlandempire).

### San Diego Association of Geologists



The next SDAG meeting will be held on Wednesday, June 21st, at Geocon, Inc., 6960 Flanders Dr., San Diego. Jorge Ledesma will discuss Baja California, Mexico. For more information, visit the association website at [www.sandiegogeologists.org](http://www.sandiegogeologists.org).

### Los Angeles Basin Geological Society



Monthly lunch meetings are typically the 4th Thursday of the month from 11:30 am to 1:00 pm at the Willow Street Conference Center, 4101 E. Willow Street, Long Beach. On June 22nd, Bill Bartling, California Department of Conservation/DOGGR, will present "*Organizational Renewal Plan and Update on Regulatory Progress and Impacts.*" For more information, visit the association website at [www.labgs.org](http://www.labgs.org).

### AEG—60th Annual Meeting



Registration is now open for the AEG 60th Annual Meeting, scheduled for September 10-16, 2017, Antlers Hotel, Colorado Springs, Colorado. For more information and updates, go to [www.AEGAnnualMeeting.org](http://www.AEGAnnualMeeting.org).

### Geological Society of America (GSA) Annual Meeting

Registration will open in June for the GSA Annual Meeting, scheduled for October 22-25, 2017, at the Washington State Convention Center, Seattle, Washington. For more information and updates, go to [www.geosociety.org/AnnualMeeting](http://www.geosociety.org/AnnualMeeting).

### Rock & Gem Shows—various locations

Various rock and mineral shows will be held throughout So. California. To find one near you, visit [www.rockngem.com](http://www.rockngem.com), then select the Show Dates tab.



**IGS MEETING LOCATION:**

**LSA Associates, Inc.  
1500 Iowa Ave, Suite 200  
Riverside, CA 92507**

**2016/2017 IGS OFFICERS****President**

Greg Johnson  
LA County DPW  
gjohnson@dpw.lacounty.gov  
626.458.1741

**Treasurer**

Margaret Gooding  
LSA Associates  
Margaret.gooding@LSA.net  
951.781.9310 x279

**Newsletter Editor**

Alice Orton  
Geocon West, Inc.  
orton@geoconinc.com  
951.401.3949

**Co-Vice President**

Jeff Fitzsimmons  
Lahontan RWQCB  
geojeff08@att.net  
951.212.5018

**Secretary**

Rachel Kolenko  
rkolenko90@gmail.com  
951.232.0430

**Web Master**

Scott Orton  
Consultant  
scottorton@hotmail.com  
951.505.6547

**Co-Vice President**

Debbie Kunath  
Consulting Geologist  
Debbie\_Kunath@ymail.com  
760.885.0232

**Membership Chairman**

Kirby Roucher  
Independent Contractor  
inlandgeologicalsociety@gmail.com  
951.522.5318