

March 2012

THE GEOLOGICAL SOCIETY OF AUSTRALIA  
Victoria Division

## Next General Meeting

Thursday 29th March at 6:15 p.m.

### Student Night

Thursday, March 29th at 6:15pm  
Fritz Loewe Theatre, School of Earth Sciences, University of Melbourne

Talks will be preceded by drinks from 5:30pm in the 4th floor tearoom and will be followed by a BBQ from 7pm onwards on the 4th floor balcony.

Our three speakers are recipients of GSAV Student Scholarships and Awards and will be presenting their most recent research from a range of fields.

Ashleigh Hood (University of Melbourne)

**"Precambrian marine dolomite formation and the oxidation of the oceans"**

Andrea Giuliani (University of Melbourne)

**"The nature of alkali-carbonate fluids in the sub-continental lithospheric mantle"**

Melanie Finch (Monash University)

**"Switch from thrusting to extension in the Zaskar Shear Zone, NW Himalaya: structural and metamorphic evidence"**

This event is also being advertised through the various Earth Science student societies to provide a great opportunity to interact with young researchers and gain some insight into some of the interesting research currently being undertaken in Victorian universities.

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**ANNUAL GENERAL MEETING**

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**Upcoming 2012 Annual General Meeting**

The AGM will be held on the 26th of April. It is now time for all of our members to consider becoming involved in the GSAV for 2012/2013. We have a few committee positions that need to be filled, and are always welcoming and encouraging people of all ages to attend committee meetings to find out what goes on behind the scenes.

Nominations are now open for executive positions in the committee, along with general committee member positions (see back page). We encourage you to consider nominating yourself or someone else. If you have any questions about what the committee does and what the positions entail, please feel free to contact any of the committee members listed on the last page of this newsletter, or emailing our secretary Adele at [secretary@vic.gsa.org](mailto:secretary@vic.gsa.org)

**2012-2013 GSAV Committee Nomination Form**

I nominate:

For the position of:

Nominator:

Seconded by:

All nominations will be presented and voted upon at the GSAV AGM on 26th April, 2012, commencing at 6:15 pm.

Please detach and mail this completed form specifying your 2012-2013 GSAV Committee nomination no later than 20th April to:

The Geological Society of Australia Inc. (Victoria Division)  
GPO Box 2355  
Melbourne VIC 3001

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**CONFERENCE REPORT****GSAV Student Scholarship Recipient****David Moore, PhD Student, Monash University**

Sixteen hours after takeoff from Tullamarine, I woke to the sight of dawn breaking over Los Angeles. Just a few hours later, I was in San Francisco, one of the more pleasant US cities with its clapboard houses built after the earthquake and Great Fire of 1906. Made it! On Sunday night I realised just how big the fall meeting of the AGU was going to be—ultimately 22,000 delegates. The Moscone Center, where it was held, was huge, and I scurried from trying to find the orientation session for first-timers to the ice-breaker, a beer-drinking exercise with no food. Lesson 1; they don't bother about your food here, unlike the AGC conferences.

Monday saw the official conference opening and the sessions begin. There were over 110 concurrent sessions on everything from aeronomy to vulcanology, plus poster sessions that filled a hall the size of Jeff's Shed and were changed each day. To help guide you around this maze of options was a daily newspaper the size of the real estate section of Saturday's paper, not to mention the website. Lesson 2. You need to be very well organised as to what you want to see before you even get to the conference. There were some excellent talks on the Japanese earthquake and also on island arcs.

I found the posters particularly interesting, since the authors were obliged to stand by their presentations for a couple of hours, during which time you could discuss aspects of the poster that interested you. Perhaps 10% of the posters had A4 sheets that you could take away, a great idea. Where these were not available, I found a camera invaluable where there was nobody there, since it allowed me to think about the poster later on. One great idea that our conference organisers might like to keep in mind is the possibility of having the posters on-line. This gives attendees the chance to catch the posters they didn't see, and distributes the material to a much wider audience. It also clearly upgrades the value of a poster compared to a verbal presentation, since the poster can be visible for months afterwards whereas a talk abstract is written months before and often only weakly reflects the key messages of the poster. However if this option is followed through, it needs to be clearly stated that the poster must be no more than a certain digital file size, otherwise it can't be viewed through standard web browsers. About 2000 posters (10%) were uploaded for the conference.

One highlight for me was a poster on the March 2011 Japanese Earthquake, which showed a seismic section across the region. I saw an uncanny resemblance to the western part of the 2006 seismic survey shot across central Victoria, which is described in issue 1 of the 2011 AJES. Yes, the present is the key to the past. My poster was on Friday, and got some kind comments, since it resolved a problem that had troubled researchers interested in the formation of the Australian Gondwanan margin. Did the subduction zone dip east or west? The answer; both ways as there were multiple subduction zones.

After the conference I flew back via Hawaii, in the hope of seeing a volcano in action. I was not disappointed; the week before the conference, the Pu'u 'Ō'ō-Kupaianaha vent on Kilauea on the Big Island started a significant eruption, which was still going when I arrived. Without a full day of walking over some pretty nasty 'a'ā lava, it was impossible to get to, so I took a helicopter ride over the vent. Although there were no lava fountains, it was spectacular, with golden rock pouring out of a crack perhaps 100 m long and pouring down through lava tubes to the sea. The heat was amazing; a hand out the helicopter window felt very warm indeed. Amazingly one house within 100 m of the vent was still occupied.

The flight also took in some exquisitely beautiful waterfalls that cascaded off 300 m-high cliffs in one sheer drop. These were in the north-east of the island, where the rainfall reaches 6500 mm/yr or about 10 times that of Melbourne. The other side of the island, where I stayed, has a rainfall less than Melbourne as it is in the rain shadow of Mauna Kea which is 4200 m ASL and was snow-covered. Anything after that was a low-light, but back home for Christmas was a gentle way back to reality. My sincere thanks to the GSAV for giving me the chance to attend an excellent conference and, indirectly, to see one of the geological wonders of the world.



Lava flow from Kilauea Hawaii entering the ocean

*Photo Credit: David Moore*

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**CONFERENCE REPORT****GSAV Student Scholarship Recipient  
Matt McGloin, PhD Student, Monash University**

I would like to thank the Geological Society of Australia, Victoria for providing me with a student bursary that allowed me to attend and present my research at the 11th Biennial meeting of the SGA (Society for Geology Applied to Mineral Deposits) in Antofagasta, Chile.

I presented a talk titled 'Mid-crustal anorogenic magmatism at Mt Isa: a spatial and geochemical study and potential links to Mesoproterozoic U-REE deposits'. As a second year PhD student, this was my first opportunity to present my research to academics outside of Monash University.

Despite obvious nerves and a little bit of excitement, it was a superb experience. Just having a fifteen minute chat after the talk with experts on the Mt Isa region and geologists that recognise similar characteristics in their own work made all the difference, and has really motivated me since.

The conference overall was a great success. I now have new friends around the world, and good excuses to return to Chile in the near future. To add to the experience, I attended a short course on the unhappy family that is IOCG (Iron-Oxide Copper Gold) deposits. The short-course was incredibly useful, placing the Australian perspective against supposed IOCG systems from around the world, and there were numerous really inspiring and dynamic speakers – something I really appreciated. In particular, talks by Roger Skirrow on Australian IOCG's and Pat Williams on how the Mt Isa/Cloncurry district IOCG deposits fit into the global perspective were very useful to my own research.

Finally, I went on a two day fieldtrip, led by the legendary Professor Guillermo Chong, to the somewhat leftfield geology of the Salar deposits of the Atacama desert. The fieldtrip really put attendees out of their geological comfort zone. It's the only place in the world where caliche nitrate and iodate minerals are actively mined, and the desert also hosts incredible lithium deposits, in salty brine, hidden beneath the salty surface crust. Debatably the driest place on earth, the conditions in the Atacama are unique, and essential to allowing spectacular yellow and white rare nitrate and iodine minerals to be preserved in the host andesite. Their origin is still a hotly debated subject.

You might think that these are minor or trivial resources, but the recent earthquake and tsunami events from Japan, and the subsequent nuclear reactor problems demonstrate a tenuous and sobering link. Demand for iodine tablets that protect the thyroid gland from cancerous radiating effects, have unsurprisingly risen dramatically this year, particularly in Asia. As someone who works with uranium mineralisation, it was quite provoking to see geology and mining at the opposite end of the nuclear cycle; Uranium as a source for



nuclear fuel, and then at the other end of the process, iodine providing protection from radiation for unmitigated nuclear disasters. Thanks again to GSAV for supporting a really inspiring 2 week trip!



Salar de Atacama – Lithium deposits hidden as a salty brine beneath this spectacular flat and ultra-arid desert crust, with the Altiplano Andes in the distance looking east.

*Photo Credit: Matt McGloin*

## FORTHCOMING EVENTS

### University of Melbourne Upcoming Seminars

All seminars at 11:00am unless otherwise specified,

Fritz Loewe Theatre, School of Earth Sciences, McCoy Building, University of Melbourne, Parkville

Details at [http://www.earthsci.unimelb.edu.au/php/seminars\\_upcoming.php](http://www.earthsci.unimelb.edu.au/php/seminars_upcoming.php)

#### Thursday April 5th, 12pm

**Dr Cathryn Birch**, University of Leeds

*"The impact of soil moisture and convectively-generated waves on the initiation of a West African mesoscale convective system"*

#### Friday April 13th

**Dr Frank Drost**, University of Melbourne

*"An investigation into future climate projections using a large perturbed-physics climate model ensemble"*

#### Friday April 20th

**Ms Erin Matchan**, University of Melbourne

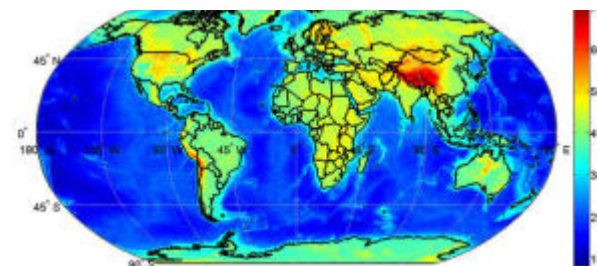
*"Calibrating the cosmogenic  $^{21}\text{Ne}$  exposure dating method for application to volcanic chronology"*

## MAPPING THE MOHO WITH GOCE

ScienceDaily (Mar. 9, 2012) — The first global high-resolution map of the boundary between Earth's crust and mantle -- the Moho -- has been produced based on data from ESA's GOCE gravity satellite. Understanding the Moho will offer new clues into the dynamics of Earth's interior.

Earth's crust is the outermost solid shell of our planet. Even though it makes up less than 1% of the volume of the planet, the crust is exceptionally important not just because we live on it, but because it is the place where all our geological resources like natural gas, oil and minerals come from.

The crust and upper mantle is also the place where most geological processes of great importance occur, such as earthquakes, volcanism and orogeny. Until just a century ago, we didn't know Earth has a crust. In 1909, Croatian seismologist Andrija Mohorovičić found that at about 50 km underground there is a sudden change in seismic speed. Ever since, that boundary between Earth's crust and underlying mantle has been known as the Mohorovičić discontinuity, or Moho.



This map shows the global Mohorovičić discontinuity -- known as Moho -- based on data from the GOCE satellite. Moho is the boundary between the crust and the mantle, ranging from about 70 km in depth in mountainous areas, like the Himalayas, to 10 km beneath the ocean floor. (Credit: GEMMA project)

Even today, almost all we know about Earth's deep layers comes from two methods: seismic and gravimetric. Seismic methods are based on observing changes in the propagation velocity of seismic waves between the crust and mantle. Gravimetry looks at the gravitational effect due to the density difference caused by the changing composition of crust and mantle. But the Moho models based on seismic or gravity data are usually limited by poor data coverage or data being only available along single profiles.

The GOCE Exploitation for Moho Modelling and Applications project -- or GEMMA -- has now generated the first global high-resolution map of the boundary between Earth's crust and mantle based on data from the GOCE satellite. GOCE measures the gravity field and models the geoid with unprecedented accuracy to advance our knowledge of ocean circulation, which plays a crucial role in energy exchanges around the globe, sea-level change and Earth interior processes. GEMMA's Moho map is based on the inversion of homogenous well-distributed gravimetric data.

For the first time, it is possible to estimate the Moho depth worldwide with unprecedented resolution, as well as in areas where ground data are not available. This will offer new clues for understanding the dynamics of Earth's interior, unmasking the gravitational signal produced by unknown and irregular subsurface density distribution.

GEMMA is being carried out by Italian scientist Daniele Sampietro, and is funded by the Politecnico di Milano and ESA's Support To Science Element under the Changing Earth Science Network initiative. This initiative supports young scientists at post-doctoral level in ESA Member States to advance our knowledge in Earth system science by exploiting the observational capacity of ESA missions.

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**STUDENT FUNDING OPPORTUNITIES**

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## **Geological Society of Australia (Victoria Division) Student Research Scholarships**

The GSAV are pleased to offer up to \$10,000 per year in scholarships available to honours and postgraduate students for assistance with travel costs associated with conferences and field work.



The scholarship is valued at up to \$500 for travel within Australia and \$700 for travel outside of Australia. The number of and value of the scholarships awarded each year is made at the discretion of the GSA(Vic) committee.

Funding will not be granted retrospectively and applicants are asked to submit forms no later than 6 weeks prior to their trip to give the committee time to consider the application.

Students that receive this scholarship are required to submit a report for publication in the newsletter, "The Victorian Geologist", following their trip. A presentation may also be requested by the committee, which will consist of a short, 10-15 minute presentation prior to the monthly seminar.

Applications forms can be scanned and emailed to: [secretary@vic.gsa.org.au](mailto:secretary@vic.gsa.org.au)

or mailed to:

Geology Research Scholarships Victoria  
Geological Society of Australia (Victoria Division)  
GPO Box 2355  
Melbourne VIC 3001

More information including eligibility criteria can be found on the form and by contacting Barbara Wagstaff ([wagstaff@unimelb.edu.au](mailto:wagstaff@unimelb.edu.au))

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### **Something interesting to share? Want to see your name in print?**

Don't be bashful, contribute to the GSA(V) monthly newsletter!

If there are any events, happenings, news, or views that would be of interest to the membership, please send your details and information to Matt Bliss at [mbliss@student.unimelb.edu.au](mailto:mbliss@student.unimelb.edu.au)

**We'd be glad to hear from you**



## FORTHCOMING SEMINARS AND EVENTS

to be presented at  
GSA (Victoria Division) meetings

Note: unless otherwise indicated, all 2011 talks will be held in the  
Fritz Loewe Theatre, Earth Sciences Building, University of Melbourne.

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April 26	Annual General Meeting
May 31	TBA
June 28	TBA

Please join the GSAV in welcoming our new members



Antwanit Gabril  
Barry Murphy  
Jonathon Wong  
Gordon Webb

Visit the GSAV on [www.vic.gsa.org.au](http://www.vic.gsa.org.au) or the GSA on [www.gsa.org.au](http://www.gsa.org.au)  
• Renewing your GSA membership is easy - it can now be done online. •

### CONSIDER CONTRIBUTING TO TAG!

It is member contributions which make  
TAG a member magazine – please keep the  
contributions coming and assist with informing  
all of the membership (not just your Division)  
about your activities.

Please send your news to: [tag@gsa.org.au](mailto:tag@gsa.org.au)



### GSA (VICTORIA DIVISION) COMMITTEE

Please address all correspondence to the GSA Victoria Division  
GPO Box 2355, Melbourne, VIC, 3001  
Internet address: [www.vic.gsa.org.au](http://www.vic.gsa.org.au)

#### OFFICE BEARERS

Chair:	David Cantrill	9252 2301 (BH)
Vice-chair:	James Llorca	9670 3410 (BH)
Secretary:	Adele Seymon	0403 269 462
Treasurer:	Barbara Wagstaff	8344 6537 (BH)

#### COMMITTEE

David Moore	0409 977 120
Noel Schleiger	9435 8408
Susan White	9328 4154
Matthew Bliss	8344 9980 (BH)
Syed Amir Mahmud	9902 4206 (BH)
Helen Green	8344 7672 (BH)

#### SUBCOMMITTEE

#### CONTACTS

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Heritage:	Susan White	9328 4154
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Webmaster:	Ken McLean	9905 1120

#### OTHER CONTACTS

Geology of Victoria:	Bill Birch	9270 5049 (BH)
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#### Newsletter deadline:

First Friday of the month except Dec & Jan  
[mbliss@student.unimelb.edu.au](mailto:mbliss@student.unimelb.edu.au)

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