



8th

International Symposium on Andean Geodynamics (ISAG)

ECUADOR

**24th - 26th
September 2019**

SECOND CIRCULAR

PRESENTATION

The +6000 km-long Andean Cordillera represents a unique natural laboratory for studying the geological and geodynamical process associated with the construction and development of a continental mountain range. A decade after the last ISAG in Nice (France), we have decided to revive this unique symposium on Andean geology and geodynamics but also its related economical and social issues. Because these topics are of major importance for Andean countries, the 8th International Symposium on Andean Geodynamics (ISAG) will be held in Quito, Ecuador on September 24-26th, 2019.

We hope this initiative will captivate your interest and you will come to participate and present your work at 8th ISAG! This meeting will also allow renewing and strengthening the ties among researchers and institutions working in the Andes. Your presence will give relevance to the ISAG!



Ecuadorian llamas at Tungurahua volcano. Photo by J. Battaglia.



Photo by B. Bernard.

Programme

As it is usual for ISAG meetings, there will be a plenary session devoted to keynote invited talks, followed by a maximum of two simultaneous thematic sessions.

The programme will include both oral and poster presentations. The organizers will make their best to follow the preference (oral/poster) indicated by the authors, but they may need to switch contributions from talks to posters if needed.

A preliminary scientific program will be included in the 3rd circular (July 2019). Final instructions and updates will be e-mailed to registered participants a few weeks before beginning of the symposium and posted on the ISAG webpage (www.igepn.edu/ec/8isag).

Participants interested in organizing additional events during the conference are strongly encouraged to propose them as soon as possible, with indication if these should be scheduled as pre- or post-symposium activities.

Scientific Themes

We especially encourage contributions addressing the following topics:

- (1) Mechanisms and processes of crustal thickening, uplift and deformation
- (2) Modern and ancient volcanism and magmatism
- (3) Interactions between climate, surface and lithospheric processes
- (4) The seismic cycle and active deformation
- (5) Sedimentary basins and petroleum geology
- (6) Andean geological resources, mineral deposits and geothermal resources
- (7) Geological hazard and risk, with emphasis on seismic, volcanic, and gravitational phenomena

Abstracts

Each participant will be allowed one oral contribution as first author. Communications must be written in English and should be 1 page-long, including text and references. Abstracts should be submitted before May 1st 2019, directly on the ISAG webpage (www.igepn.edu.ec/8i-sag) by filling the corresponding form.

Oral and poster presentations

Talks will last 12 minutes each, and will be followed by 3 minutes of discussion. For oral and poster sessions, the preferred language is English, although Spanish is also accepted. However, there will be no facilities for simultaneous translation. There will be a poster session each day (from 16h30 until 18h00). Posters will remain on display all day long. Maximum dimensions for posters are 80 cm in width (horizontal) and 110 cm in height (vertical).

Field trips

The organizing committee is planning the following pre- and post-symposium fieldtrips. To attend, please add the cost of the selected trip to your registration payment. The cost of each field trip includes bus and/or air transport, lodging in double occupancy rooms, dinner (except in Field trip 1), breakfast, box-lunch, and field guides. All taxes are included. The quoted prices for each trip are close to the final costs, but small variations may occur later in the year. Given that there are logistic limitations, the number of participants will be restricted. Reservations will be dealt with on a “first come, first serve basis”.

Note: Participants are advised that we will be at high elevations, up to 4500 m above sea level (asl). Please be sure that your health is compatible with being at these altitudes. Above 3000 m asl, temperatures will generally be between 5 – 20°C; driving rain and strong winds are possible. Sunscreen, hats, and adequate clothing are necessities. Water and lunch will be provided in the field. The organizing committee will not be responsible for any accidents that might occur during the trip. Participants are recommended to have their own health and travel insurance.



Lava flow from Cotopaxi Volcano. Photo by D. Andrade

The vertical movements of the coastal domain of Ecuador over different time scales (Manta Peninsula and Isla de la Plata area)

Leaders: M. Saillard, F. Michaud, P. Reyes, A. Cabero, Y. Font, M. Régnier, J.N. Proust, A. Cisneros, M.J. Hernandez (Géoazur and DG-EPN)

Dates: September 20th to 23th, 2019 (*)

(*) Due to flight's reservations, we need people to sign up for this fieldtrip before June 3rd

Approx. cost: \$ 680. This price includes hotel night in the 19th, air ticket to and from Manta, and boat tickets to and from the Isla de la Plata. This price does not include dinners.

Minimum number of participants: 15

Maximum number of participants: 30

Tectonic deformations, and in particular vertical movements, recorded by the coastal domain above the Ecuadorian subduction zone reflect a complex geological history. These vertical movements can be quantified at different time scales, at the short-term from the scale of the seismic cycle to many cumulated cycles (100 ka) to the long-term (Ma) by combining tectonic markers. In this fieldtrip, we propose to explore vertical movements through morpho-tectonic markers of coastal uplift (uplifted marine terraces) and sedimentary and stratigraphic markers of formation of the Coastal Cordillera (evolution of forearc basins). This fieldtrip will focus on Manta Peninsula and La Plata Island. The observed markers will be placed in their seismic, tectonic and geological context. Please note that this fieldtrip will be done in spanish.



Isla de la Plata. Photo by M. Saillard.

Cotopaxi Volcano: rhyolites to andesites from 0.5 Ma to the present

Leaders: P. Mothes and M.L. Hall (IGEPN)

Dates: September 21th and 22th, 2019

Approx. cost: \$ 265. This price includes hotel night in Quito the 20th and 22th.

Minimum number of participants: 15

Maximum number of participants: 35

Cotopaxi volcano is one of the most active and iconic stratovolcanoes of the Ecuadorian Andes. Its history covers more than 0.5 Ma and includes the rhyolitic explosive deposits of its Pleistocene volcanic history, including the (~200 ka, 100 km³) Chalupas ignimbrite. During this fieldtrip, we will also observe the eruptive products of the last 7000 ka, that includes rhyolitic tephra fallout and pyroclastic flow deposits, debris avalanche and lahar deposits, and the historical scoria flows and debris flows deposits.



Ash emission from Cotopaxi volcano during the 2015 eruptive phase. Photo by B. Bernard

Major active faults and historic earthquake surface ruptures in Central Ecuador

Leaders: S. Baize (IRSN), L. Audin (IRD), A. Alvarado (IG-EPN) and H. Jomard (IRSN)

Dates: September 20th to 23th, 2019

Approx. cost: \$510. This price includes hotel night in Quito the 19th.

Minimum number of participants: 15

Maximum number of participants: 35

The Chingual-Cosanga-Pallatanga-Puna fault system is a major tectonic feature of the northern Andes, which accommodates the relative displacement (8 mm/a) between the North Andean Sliver and the South America Plate (Alvarado et al., 2016). The fault system imprints are strikingly similar to those of other major continental fault zones in the world. It includes a series of parallel or branching active fault strands, which historical activity is suggested by major and damaging earthquakes since at least the 17th century (Yepes et al., 2016).

During this 4-days field trip, we plan to present, among other short stops, the most prominent geomorphological and geological evidences of fault activity along this system, including surface ruptures associated with moderate and large magnitude earthquakes. We will have a look at Quito fault zone (Alvarado et al., 2014), then drive to the south in order to get an overview of recently studied active faults. We will have a look at the Pallatanga fault in Rumipamba where the first trenches in Ecuador were performed to find back the source of 1797 M7.5+ Riobamba earthquake (Baize et al; 2015) and drive uphill to the Pisayambo Laguna area where a M5 earthquake ruptured the fault system up to the surface (Champenois et al., 2017). We will also make a detour to the Igualata volcano summit (4500m) to observe a surface rupture, which is probably associated with the major Riobamba earthquake (Baize et al., *in prep*).



Trench studied at Pallatanga Fault. Photo by A. Alvarado.

The geology of the Ecuadorian Eastern Cordillera

Leaders: R.A. Spikings (U. Genève), B. Beate (DG-EPN)

Dates: September 20th to 23th, 2019

Approx. cost: \$ 400. This price includes hotel night in Quito the 19th.

Minimum number of participants: 15

Maximum number of participants: 35

The Eastern Cordillera of Ecuador is an Andean trending magmatic and metamorphic belt that exposes rocks spanning from the Palaeozoic basement to the modern active arc, and records the early disassembly of Pangaea in the Triassic, subsequent prolonged Jurassic - Early Cretaceous active margin magmatism during hyper-extension, and the collision and accretion of the Caribbean Large Igneous Province in the late Cretaceous. The field trip plans to make the following stops: (1) Ammonite bearing quartzites and slates of the Chaucha Block, which is considered to be para-autochthonous continental crust that rifted from South America during Early Cretaceous hyper-extension (stop close to the town of Alausi); (2) The Peltepec sequence, which is a tectonic melange that hosts ultra-mafic and mafic lithologies, which range in age from Neoproterozoic to Early Cretaceous, and is considered to have formed during the closure of an Early Cretaceous basin that was floored by a transitional mafic crust; (3) Tungurahua Volcano, which is part of the modern arc and has been continually erupting since 1999 until the mid-2016; (4) A west-to-east traverse across the Cordillera, where we will cross Triassic anatectites that formed during a rift-to-drift transition, and Jurassic-Early Cretaceous arc rocks that formed in a prevailing extensional setting.



Sheared metasedimentary rocks of the Alao-Paute Arc, unconformably overlain by basaltic lavas of Volcano Tungurahua. (Town of Baños). Photo by R. Spikings.

The Oligocene – Miocene volcanic province of Southern Ecuador

Leader: M. Mulas (ESPOL)

Dates: September 20th to 23th, 2019 (*)

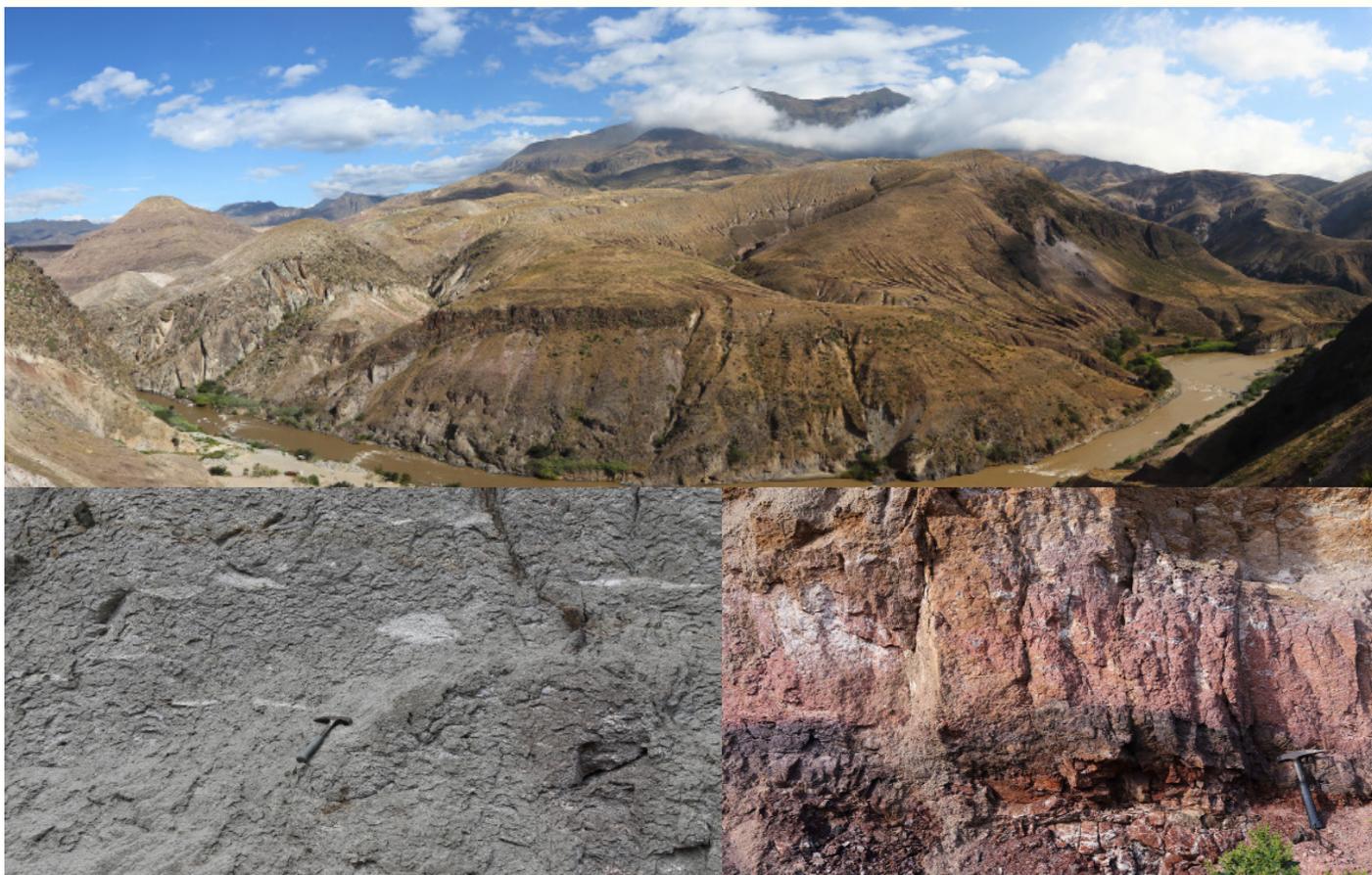
(*) Due to flight's reservations, we need people to sign up for this fieldtrip before June 3rd

Approx. cost: \$ 600.

Minimum number of participants: 15

Maximum number of participants: 35

The southern sector of Ecuador (between 2°S and 6°S) has been characterized by intense magmatic activity in the period comprised between Oligocene and Miocene (Hungerbuhler et al. 2002). The volcanic sequence in the Pucará-Santa Isabel sector is composed by the Saraguro Fm. (26-21 Ma) followed by the St. Isabel Fm. (18 – 7.6 Ma) and closed by the Tarqui Fm. (6.3 Ma). These volcanic formations, made principally of welded ignimbrites, show large lithofacies variability (boulder size to lapilli size lithics, crystal rich to fiamme-rich ignimbrites) that reflects different PDC run-out and principally different sources. Stratigraphic and geomorphologic constraints allow to locate calderas structures (mean diameter 13 x 7-km) related with the Jubones and Santa Isabel ignimbritic eruptions.



Fm. Jubones and Fm. Santa Isabel. Observation of fiammae and vithophyre. Photo by M. Mulas.

Cretaceous Geology and Metallogeny of Southern Ecuador

Leaders: O. Poma (Cornerstone Ecuador S.A.), Arturo Egüez (DG-EPN)

Dates: September 27th to 30th, 2019 (*)

(*) Due to flight's reservations, we need people to sign up for this fieldtrip before June 3rd

Approx. cost: \$660

Minimum number of participants: 15

Maximum number of participants: 20

The cretaceous Alamor-Lancones basin is located into the Huacabamba deflection, a geographic region which represents the transition between Central to Northern Andes, where the Cordillera change from NW to NE trend. The basin is limited by Triassic metamorphic blocks, the Amotape-Tahuin to the northwest and the Loja Terrane to the Southeast.

The Alamor-Lancones basin can be divided into a northwestern quartz-rich domain and a southeastern volcanoclastic domain (Jaillard et al, 1999). The earliest volcanism accompanying rifting is dominated by basaltic pillow lavas and breccias with related VMS deposits formed between 104 to 100 Ma. A second phase of felsic-rich volcanism with ages of 99 to 91 Ma intercalated and overlain by siliciclastic and carbonate sedimentary sequences in northwestern section of the basin (Winter, 2008), at this time the Bramaderos porphyry was deposited (Schutte, 2010) and possible related epithermal vein systems at its borders.

The aim of the field trip is go through the basin from the northwest area in the contact between metamorphic rocks and overlain sedimentary western domain toward the southeastern domain where dominated volcanism with porphyry and epithermal deposits are present on the upper sequences and ending in the lower basaltic sequences.



Volcaniclastics and sediments near Bramaderos porphyry with strong argillic to phyllic alteration, cutting by late mineral andesitic dykes. Outcrop in the pan american highway. Photo by Osman Poma.

2nd Workshop on Ecuadorian Geology

Organizers: R.A. Spikings (U. Genève) and B. Beate (DG-EPN)

Dates: September 18th and 19th, 2019

The 2nd Workshop on Ecuadorian Geology will directly precede the International Symposium on Andean Geodynamics (ISAG), and will be held on the campus of the Escuela Politécnica Nacional, Quito. The workshop is two days long, and we invite delegates to submit abstracts for oral presentations, which are presented in a single session during the first day, and the morning of the second day. We also encourage delegates to submit abstracts to the ISAG. Abstracts are requested on all aspects of Ecuadorian geology, including field studies, structural, magmatic and metamorphic studies, sedimentary, petroleum and ore geology. We also encourage presentations that include the application of innovative analytical methods to Ecuadorian geology. The final afternoon is reserved for discussion groups, who regroup towards the end of the day and present their findings and recommendations to all delegates. The 1st Workshop occurred in September 2017, and was initiated to discuss the Geological Map of Ecuador, which was released by INIGEMM in 2017. Discussion groups during the 1st Workshop included, i) The Alamor-Lancones Basin, ii) Outstanding questions about the geology of the Cordillera Real, and iii) the geology of the Oriente Basin.

For information about this event please contact: richard.spikings@unige.ch or bbeate49@gmail.com

REMAKE Workshop – Seismic Risk in Ecuador: Mitigation, Anticipation and Knowledge of Earthquakes (2016-2020)

Organizers: Ph. Charvis (Geoazur), A. Alvarado (IGEPN)

Dates: September 27th and 28th, 2019

The aim of this project is to develop a pilot prototype of earthquake forecast model in Ecuador and in Peru where major earthquakes and tsunamis are likely to occur in the future. The novelty of the model is that it will integrate our complete knowledge on faults, including their seismic potential quantitatively evaluated from geodetic, seismological and geological approaches.

The primary deliverable is the anticipation of the location, size, frequency, ground motions of future destructive events. Our project includes a focus on hazards and vulnerability in Quito, and the development of a near real-time seismic response platform.

We will present the state of the art of the program including the deformation and seismic activity before and after the main shock of the Pedernales Mw=7.8 Earthquake which struck Ecuador in 2016. This program is supported by the grant ANR-15-CE04-0004 of the French National Research Agency, by the IG-EPN, IRD and CNRS.

For information about this event please contact: philippe.charvis@ird.fr or aalvarado@igepn.edu.ec

WORKSHOP: Seventeen years (1999-2016) of eruptive activity at the Tungurahua andesitic volcano

Organizers: S. Hidalgo (IG-EPN), P. Samaniego (IRD), P. Mothes (IG-EPN), J.L. Le Pennec (IRD), B. Bernard (IG-EPN) M. Ruiz (IG-EPN), P. Ramon (IG-EPN), S. Vallejo (IG-EPN), H. Yepes (IG-EPN)

Dates: September 28th to October 1st, 2019

Tungurahua volcano is one of the most active volcanoes of the Ecuadorian Andes. After ~75 years of quiescence, Tungurahua reactivated in October 1999 and remained active until the mid 2016. During this time, the volcano experienced low-to-moderate eruptive activity characterised by frequent canon-like explosions, local ash dispersal and frequent lahars. This pattern of activity changed in 2006, when the large subplinian eruptions occurred (July 14th and August 16th) and produced large pyroclastic density currents and regional tephra dispersal. Since then, eruptive activity evolved to short-lived vulcanian-like events followed by smaller explosions and almost frequent ash emissions (February 2008, May 2010, December 2012, July 2013, February and April 2014, February 2016).

The main goal of this workshop is to commemorate the 20 th anniversary of the beginning of this eruption by bringing together volcanologist that have worked or still work on Tungurahua. We seek contributions from different approaches, such as physical volcanology, petrology, geophysics and those interested on the social issues associated with this long-lived eruption period.

For information about this event please contact: shidalgo@igepn.edu.ec or pablo.samaniego@ird.fr



Strombolian activity at Tungurahua volcano. Photo by B. Bernard.

Registration

Any participant who wish to present a communication, or to attend the symposium, must register on-line at the ISAG website (www.igepn.edu.ec/8isag). Payment will be done by credit card directly on the ISAG webpage. Otherwise, participants are invited to contact the local organizers (isag@igepn.edu.ec) if a bank transfer will be requested. Regular (early bird) payment fees are 180 USD before June 30th, 2019, and 230 USD after this date. Fees for students are 100 USD (a proof of student status is requested). These incomes will be used to help South American researchers and students to attend the ISAG through special grants (see below).

Registration fees include the conference registration and materials, the ice-breaker welcoming cocktail on September 23th, six coffee breaks, and the conference closing cocktail on September 26th. Registration fees do not include regular meals, lodging, or transportation.

Cancellation and refunds

A written notification of cancellation must be sent to the local Organizing Committee (isag@igepn.edu.ec) before a refund can be issued. An administrative charge (30% per participant) will be deducted from the cancelled amount, and that before August 1st, 2019. After this date no refund will be made. All refunds will be processed after the Conference.

Special grants

A limited number of special grants will be available to help professionals and students to participate to the 8th ISAG. These grants will be preferentially allocated to scientists and PhD students from South America, and will include registration fees and lodging (in double room) at the conference hotel (Hotel Quito). If you are interested in apply for these special grants, we recommend to register and submit an abstract following the online procedure detailed in this webpage. Requests must be sent to isag@igepn.edu.ec before **April 15th**, 2019, and must include: (1) the applicant's name, affiliation and address, (2) a short curriculum vitae, and (3) a reference to the contribution presented at the 8th ISAG.

Air transportation to Quito

Quito's international airport is served by a great number of international airlines, such as American Airlines, Air Europa, Aeroméxico, Avianca, Copa Airlines, Delta, Iberia, KLM, Latam, among others. Please consult your local travel agency for cheaper fares and reservations, as purchases of airline tickets in Quito might be higher in price.

Important Note: Ecuador has placed a requirement to enter the country. Your passport must be valid for at least 6 months from the day you start your flight to Ecuador. It cannot expire within 6 months of your travels to Ecuador.

Hotel accommodation

Quito is a tourist city and it is preferable to book accommodation in advance. The Organizing committee selected the Hotel Quito as the official hotel for the ISAG and obtained very special discount prices. For additional information about this hotel, please visit the web page at www.hotelquito.com.ec

We propose a package fee including regular meeting rate (180 USD), transfer in, four days accommodation at the official hotel (23th - 26th September) at single or double occupancy (including breakfast).

Hotel Quito (www.hotelquito.com.ec)

First class

Single room (800 USD) or double room (495 USD per pax)

Standard class

Single room (560 USD) or double room (385 USD per pax)

Medium class

Single room (475 USD) or double room (345 USD per pax)

We also propose other **economical class** hotels (at 5-10 min walking from the official hotel) at double occupancy room (package fee of 305 USD per pax). Participants are invited to consult the ISAG web site (www.igepn.edu.ec/8isag) or contact the organizing committee (isag@igepn.edu.ec) which may provide other interesting options.

Social events

An Ice-breaker will take place on September 23th and a Conference closing cocktail on September 26th. The costs are included in the registration fees. To attend, please mark these options when registering on the webpage.

Executive Committee

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Correspondence and enquiries

Please send a message to isag@igepn.edu.ec or contact the local organizers

For more information, you can check the updates on our webpage:
www.igepn.edu.ec/8isag

**8th ISAG
Quito, Ecuador (2019)**

Key dates

Online registration opening	February, 2019
Deadline for abstracts	May 1 st , 2019
Deadline for early bird registration	June 30 th , 2019
Mailing of the third circular	July, 2019
Symposium in Quito	September 24 th -26 th , 2019