

# IAU Symposium 313

*“Extragalactic Jets from every angle”*

September 15<sup>th</sup> – 19<sup>th</sup>, 2014  
Galapagos Islands (Ecuador)

Webpage: <http://iau313ecuador.epn.edu.ec>

IAU Webpage: <http://www.iau.org/science/meetings/future/symposia/1097/>

## FIRST ANNOUNCEMENT

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# 1 Scientific Rationale

Extragalactic jets provide the direct observational evidence for a connection between supermassive black holes and surrounding cosmic environment. They deliver the energy released by an accreting black hole to large distances and impact the formation and evolution of surrounding structures. The significance of relativistic jets is visible on many physical scales and in a variety of astrophysical sources. They carry information about the black hole power, spin, accretion state and characteristic timescales, and probe the environment beyond the black hole's immediate sphere of influence.

In recent years, both space and ground based telescopes are providing new insights to investigate jet physics. New data on jets have been accumulating from space missions such as Swift, XMM-Newton, Chandra, Suzaku, Fermi, Hubble, Spitzer and WISE. Upgraded and future ground based facilities such as JVLA, ATCA, ALMA, LOFAR and SKA will provide higher quality data at both the lowest and highest radio frequencies. At higher energies, the atmospheric Cherenkov telescopes, HESS, MAGIC, and VERITAS have provided evidence indicating rapid time variability in jets, and in the future these facilities will be augmented by CTA. Although we are now living in a “golden age” and despite the recent progress, many new and unsolved problems specific to the physical mechanisms underlying jet physics are still under debate.

This is an excellent time to bring together observational astronomers working across the electromagnetic spectrum with theorists to address the pressing questions concerning our understanding of the physics of relativistic jets. The open questions to be addressed include unification scenarios for blazars and radio galaxies, the interactions between jets and their environments, the composition and structure of jets and the mechanisms leading to their collimation, the role of magnetic fields, the mechanisms of particle acceleration in jets, the location of high-energy emission sites, and the scaling of physical jet phenomena with black-hole mass, from Galactic to extragalactic sources.

These are the topics that will be addressed in the IAU Symposium 313: “Extragalactic Jets from every angle” (Galapagos 2014).

## 2 Topics

1. Black-hole - extragalactic jet connections: statistics, intermittency, unification.
2. Multifrequency observations of highly variable relativistic jets including tidal disruption events.
3. Jet interactions and their role in the structure evolution and feedback.
4. Cosmological evolution of jet progenitors.
5. Particle acceleration mechanisms, cosmic rays, and high-energy radiative processes.
6. Jet structure, collimation, and the role of the magnetic field.
7. Close to the black hole: launching jets.
8. Extragalactic and Galactic jet synergies.
9. Extragalactic jets in the SKA, LSST, and CTA era.

## 3 Organizers and sponsors

### – International Astronomical Union (IAU)

Coordinating IAU Division:

- Division D: High Energy Phenomena and Fundamental Physics

Supporting IAU Divisions:

- Division J: Galaxies and Cosmology
- Division B: Facilities, Technologies and Data Science

Supporting IAU Commissions:

- Commission 40: Radio astronomy
- Commission 44: Space & High energy Astrophysics

### – Quito Astronomical Observatory (OAQ) of the Escuela Politécnica Nacional in Quito

### – Smithsonian Astrophysical Observatory

### – Santa Cruz Municipality, Galapagos Islands

## 4 Organizing Committees

### Scientific Organizing Committee [iausymp313@gmail.com](mailto:iausymp313@gmail.com)

#### Chairs:

- Francesco Massaro (Italy)
- Teddy Cheung (United States)
- Ericson Lopez (Ecuador)
- Aneta Siemiginowska (United States)

#### Members:

- Geoffrey Bicknell (Australia)
- Roger Blandford (United States)
- Markus Böttcher (South Africa)
- Elisabete de Gouveia Dal Pino (Brazil)
- Jun-Hui Fan (China)
- Martin Hardcastle (United Kingdom)
- Yuri Kovalev (Russia)
- Richard Lovelace (United States)
- Alan Marscher (United States)
- Raffaella Morganti (Netherlands)
- Neil Nagar (Chile)
- Prajval Shastri (India)
- Lukasz Stawarz (Japan)
- Megan Urry (United States)
- Diana Worrall (United Kingdom)

### Local Organizing Committee [observatorio.astronomico@epn.edu.ec](mailto:observatorio.astronomico@epn.edu.ec)

#### Chair:

- Ericson Lopez

#### Members:

- Salim Abedrabo
- Alberto Celi
- Klever Vicente

## 5 Preliminary list of invited speakers and talks

### Review talks

- *Opening lecture*: Mitchell Begelman (USA) (TBC)
- *Observational aspects of extragalactic jets*: Jun Kataoka (Japan)
- *Theory and simulations of extragalactic jets*: Geoffrey Bicknell (Australia)
- *Extragalactic jets: observations meets theory*: Daniel Harris (USA)
- *Closing lecture*: Annalisa Celotti (Italy)

### Invited talks

- *Black-hole - extragalactic jet connections*: Preeti Kharb (India)
- *Multifrequency observations of highly variable relativistic jets*: Henric Krawczynski (USA) (TBC)
- *Jet interactions and their role in the structure evolution and feedback*: Laura Bîrzan (Netherlands)
- *Cosmological evolution of jet progenitors*: Marta Volonteri (France)
- *Particle acceleration mechanisms, cosmic rays, and high-energy radiative processes*: John Kirk (Germany)
- *Jet structure, collimation, and the role of the magnetic field*: Denise Gabuzda (Ireland) (TBC)
- *Close to the black hole: launching jets*: Alexander Tchekhovskoy (USA)
- *Extragalactic and Galactic jet synergies*: Gustavo Romero (Argentina)

### Highlight talks

- *Future CTA perspective on extragalactic jets*: Elisabete De Gouveia Dal Pino (Brazil)
- *Future SKA perspective on extragalactic jets*: Bernie Fanaroff (South Africa)
- *Extragalactic Jets from every angle: the point of view of RadioAstron*: Kirill Sokolovsky (Russia)
- *Future LSST perspective on extragalactic jets*: TBD

## 6 Location and Venue

A microcosm of sensations and flavors in the center of the planet that is Ecuador. A unique country where all cultures, peoples and landscapes of Latin America merge to form the world's most perfect scent. Ecuador is located on the equator in northwestern South America. It shares its northern border with Colombia, Peru on the east and south, and on the west by the Pacific Ocean. Four worlds converge in its territory, from the warm Pacific Coast drenched that gradually rises toward the snowy heights and temperate valleys of the Andes mountains to finally introduce the green carpet of Amazonian biodiversity. All as a prelude to a sublime reward: the Galapagos Islands.

The IAU Symposium entitled “Extragalactic Jets from every angle” (Galapagos 2014), will take place in the Puerto Ayora town, Capital of Galapagos Province of Ecuador and located in the Santa Cruz island, the second largest of the Galapagos islands of Ecuador. Puerto Ayora is the most populous town in the Galapagos Islands, with more than 12,000 inhabitants. This town is the capital of Santa Cruz Island, and it has the best developed infrastructure in the archipelago. This is a safe tourist town, and offers many activities and attractions to the visitors.

The symposium venue is the auditorium of the Santa Cruz Municipality, with a capacity for 250 people, located in the very center of the town (between the Grand Lobo de Mar Hotel and the office of TAME, an Ecuadorian airline). The conference is organized with the support of the mayor of the city and his administrative collaborators.

The venue address is:

**Av. Charles Darwin y 12 de Febrero**  
**Puerto Ayora, Capital of Galapagos, Ecuador**  
**Tel: 593-5 2526 153, Fax: 593-5 2526 505**

Ecuador has an astronomical tradition that came from the ancient and most developed cultures in America that inhabited these lands for millennia. Among the most famous, the Quitus whose astronomical knowledge allowed them to determine with great precision the location of the equinoctial line (zero latitude), having happened two thousand years ago before the arrival of the France Geodesic Mission of 1736 that reached the same conclusion through measuring a precise arc of the Earth's meridian. Moreover, the word “quits” in ancient indigenous quechua languages means the middle of world and the middle of time, and this is the origin of the name of the contemporary Capital city of Ecuadorians, Quito.

Another great culture is the Inca Empire that ran along the Pacific coast and Andean highlands from the northern border of what are today called Ecuador to the Maule River in Chile. The Ancient Inca built aqueducts, cities, temples, fortresses, tunnels, suspension bridges, large roads and had a great understanding of mathematics and agriculture and they also knew about hydraulics, astronomy, architecture and military strategy. The great astronomical understanding of ancient cultures of Ecuador have been recorded in archaeological vestiges and ceremonial-astronomical sites preserved until today. Nowadays, this tradition continues when in 1873 was founded one of America's oldest observatories (in the meaning of specialized research institution). Its first director was Juan Bautista Menten, who directed and planned the construction of the Observatory. This was a world-class astronomical observatory located in Quito just arc minutes south of the equator. It is in a gorgeous old building that was completely restored just three years ago under the Direction of Ericson Lopez.



## 8 Program Outline

The IAU Symposium, entitled "Extragalactic Jets from every angle" (Galapagos 2014), will be held in the Galapagos Islands from September 15<sup>th</sup> (Monday) to 19<sup>th</sup> (Friday), 2014. Registration and welcome will be organized on September 14<sup>th</sup> (Sunday), while the social dinner will be on September 16<sup>th</sup> (Tuesday).

The conference will start every day at 9am and will finish around 6pm, with the exception of Wednesday when we plan to finish at 1pm when a half day social event will be organized in the afternoon. Lunch time will be from 1pm to 2.30pm every day. Each session will be interrupted by a coffee break 30 min long to facilitate discussions between participants.

We expect to have 4.5 days of meeting, for a total of 9 sessions, 2 sessions per day (1 only on Wednesday), corresponding to each topic, with the last one focusing on a detailed discussion on how the current and future facilities will help to investigate the physics of the extragalactic jets.

The total number of invited talks is 14 consisting of the 1 opening, 1 closing, 3 reviews, and 9 invited talks. We plan to have an invited review talk each day of the conference allocating 45 mins for it (35 min talk + 10 min discussion period) each day of the conference; the first day it will represent our overview talk while in the afternoon of the last day, it will serve as summary talk of the symposium. At the beginning of each session, there will be an invited talk of 30 minutes (25 min talk + 5 min discussion and questions) to summarize the current status of the research concerning the specific topic. Three highlight talks (20 min talk + 5 min for questions) have been also organized to present future prospectives from CTA, SKA and LSST, and a present perspective talk from RadioAstron.

We can also comfortably arrange about 10 contributed talks per day (5 only on Wednesday), each of them of 20 min duration (15 min talk + 5 min discussion and questions) to have at least 60 contributed talks allowed in our schedule.



## 9 Abstract submission

The Abstract submission form is given at the conference website

<http://iau313ecuador.epn.edu.ec>.

The deadline is March 1<sup>st</sup>, 2014 for the contributed talks while July 1<sup>st</sup>, 2014 for posters. If you have several contributions, please submit each abstract separately. We only support a single talk and up to two posters per attendee.

## 10 Registration

The registration form is given at the conference website <http://iau313ecuador.epn.edu.ec>.

The deadline for early registration is April 1<sup>st</sup>, 2014 while the regular registration is open until July 1<sup>st</sup>, 2014.

### Preliminary Registration:

If you wish to pre-register in order to receive important updates and news regarding the IAU 313 Symposium, please follow these instructions:

1. cut and paste the preliminary registration form provided in the last page of this announcement;
2. fill it completely;
3. send it to [iausymp313@gmail.com](mailto:iausymp313@gmail.com), indicating in the e-mail subject ONLY: *Preliminary registration*.

### Registration fees:

Early online registration (before April 1<sup>st</sup>, 2014): US \$ 300

Regular online registration (before July 1<sup>st</sup>, 2014): US \$ 400

Early online registration for students (postdocs excluded) (before April 1<sup>st</sup>, 2014): US \$ 175

Regular online registration for students (postdocs excluded) (before July 1<sup>st</sup>, 2014): US \$ 275

The registration fee includes:

- Group transportation from Baltra airport to Puerto Ayora town center on arrival dates (Sep. 13<sup>th</sup> and 14<sup>th</sup>) and departure dates (Sep. 20<sup>st</sup> and 21<sup>nd</sup>).
- participants kits (abstract book, program and other materials).
- Welcome Reception on September 14<sup>th</sup>.
- Coffee/tea breaks and refreshments.
- A copy of the IAU S313 Proceedings Book.

- If you have problems with web access or with the online registration, please send the completed form as an email attachment to [observatorio.astronomico@epn.edu.ec](mailto:observatorio.astronomico@epn.edu.ec) or [iausymp313@gmail.com](mailto:iausymp313@gmail.com).

- Accommodation and social events requests should be sent through the registration form.

## 11 Travel arrangements

### VISA

A valid passport is required for travel to mainland Ecuador and the Galapagos Islands. According to information provided by the Ecuadorian Ministry of Foreign Affairs, most nationalities do not require visas for Ecuador and the Islands to stay up to 90 days. Upon entry visitors are automatically given a 90-day tourist visa. Upon arrival in Ecuador or on your flight to Ecuador, you will fill out a T3 Tourist Information Card. This will be turned into immigration upon arrival and a copy of it will be returned to you along with your passport. You will be required to turn it in when you leave the country.

Only Citizens of the People's Republic of China, Afghanistan, Bangladesh, Eritrea, Ethiopia, Kenya, Nepal, Nigeria, Pakistan and Somalia require visas, but please verify potential updates to your home country regulations. The LOC will work with such participants to provide any necessary letter of invitation. Travelers also need to show proof of departure from Ecuador to customs and immigration as they arrive in the country; this can simply be a return or onward airline ticket.

**Note however there is a 100 USD tourist fee upon arrival to the Galapagos Islands as it is a natural preserve land. This is payable only in US dollars cash.**

### AIRFARES

The main airport on the Galapagos Islands is Baltra airport (airport code: GPS). Baltra airport is served internationally by LAN Ecuador and additionally by the following Ecuadorean airlines: AeroGal and TAME. The transfer from the airport to the town of Puerto Ayora will be arranged by the LOC only from/to this airport on arrival dates (Sep. 13<sup>th</sup> and Sep. 14<sup>th</sup>) and departure dates (Sep. 20<sup>th</sup> and 21<sup>st</sup>).

### ACCOMMODATIONS

The conference venue is a highly touristic place visited by thousands of tourists during the year, thus the town of Puerto Ayora has well developed hotels and hostel services. The LOC is currently working on arranging special rates with the main hotels on the island to facilitate people that are attending the meeting.

Additional information on the flights and on the hotels will be available on the website by October 15<sup>th</sup> and will also be communicated by the end of 2013.

## 12 IAU support grants

The IAU provides grants to cover in part the expenses associated with attendance at the IAU Symposium 313. In particular, the IAU wishes to support qualified scientists to whom only limited means of support are available, e.g., colleagues from economically less privileged countries and young scientists.

We encourage those planning to attend the symposium to apply for an IAU Grant using this form (<http://www.iau.org/static/meetings/GrantSymposiumRIM.pdf>) at your earliest convenience and send it by e-mail to the organizers ([iausymp313@gmail.com](mailto:iausymp313@gmail.com)) with the subject line “IAU S313: Application for Support grant”. Although the form notes that the amount requested should be in US dollars, requests can be made in Euros, but be sure to indicate this is the currency of your request on the form. The deadline for grant application is February 1<sup>st</sup>, 2014. We will acknowledge receipt of all applications before February 1<sup>st</sup>, 2014.

## 13 Social Events

The social program includes:

- Welcome Reception Sunday evening, September 14<sup>th</sup>, at 18:30-22:00 (included in the registration fee).
- Astronomical Public Lecture, Tuesday September 16<sup>th</sup>, starting 19:30, followed by Star Party at 20:30-23:00.
- Group excursion (TBD) on Wednesday, September 17<sup>th</sup>, at 14:00-20:00 (not included in the registration fee).
- Social Dinner Thursday, September 18<sup>th</sup>, at 19:00-23:00 (not included in the registration fee).
- Astronomical Public Lecture, Friday September 19<sup>th</sup>, starting 19:30, followed by Star Party at 20:30-23:00.
- For those arriving early or staying late, we will arrange for additional (not included in registration fee) group excursion opportunities on Sunday, September 14<sup>th</sup> and on Saturday, September 20<sup>th</sup> (additional information will be provided later).

# 14 Important Dates and Deadlines

## Announcements

- mid - September 2013: Preliminary announcement.
- October 15<sup>th</sup>, 2013: website on-line.
- November 1<sup>st</sup>, 2013: First announcement: open abstract submission.
- May 1<sup>st</sup>, 2013: Second announcement: preliminary program.
- July 1<sup>st</sup>, 2014: Final Announcement with detailed Program and list of Participants.

## Abstract Submission and presentations

- November 1<sup>st</sup>, 2013: Online Abstract Submission Open.
- March 1<sup>st</sup>, 2014: Online Abstract Submission for contributed talks Close.
- March 23<sup>st</sup>, 2014: Contributed Talk Notification to Submitters.
- July 1<sup>st</sup>, 2014: Online Abstract Submission for posters Close.

## Support Grant Applications

- November 1<sup>st</sup>, 2013: Online IAU Grant Application Open.
- February 1<sup>st</sup>, 2014: Online IAU Grant Application Close.
- March 1<sup>st</sup>, 2014: IAU Grant Notification to Applicants.

## Registration

- December 1<sup>st</sup>, 2013: Early Online Registration (with reduced fee) open.
- April 1<sup>st</sup>, 2014: Early Online Registration (with reduced fee) close.
- July 1<sup>st</sup>, 2014: Regular Online Registration close.

## IAU Symposium 313 Proceedings

- November 1<sup>st</sup>, 2014: Deadline for submission of the Proceedings.
- January 1<sup>st</sup>, 2015: Submission of the Proceedings Book by Editors for publication.
- May 1<sup>st</sup>, 2015: publication of the Proceedings.

## 15 Proceedings

The Symposium proceedings will be published by the IAU publisher, Cambridge University Press (CUP). The proceedings will be published both electronically and in print, and both a hardcopy and online access to the proceedings are included in the proceedings cost. This cost is included in the registration fee of the symposium. Only material presented in person at the meeting will be included in the proceedings.

Following the IAU guidelines, the proceedings must be published within six months of the symposium. Given the three months lead time required by the publishers, and the time required for editing, we request that all manuscripts be submitted by 1 November 2014. We will not accept any delay.

The style files and sample papers necessary for authors can be found at the following link: [http://www.iau.org/static/scientific\\_meetings/authors/](http://www.iau.org/static/scientific_meetings/authors/). Instructions are detailed in the [readme\\_proceedings.pdf](#) file.

All authors are required to complete and return an IAU Copyright Form, either electronically or in hardcopy. We will have the IAU Copyright Forms available during the meeting. The editors are F. Massaro, C. C. Cheung, E. Lopez, A. Siemiginowska.

Please email your LaTeX file, figures (if any), and individually compiled PDF contribution to [iausymp313@gmail.com](mailto:iausymp313@gmail.com) as attachments with the subject line Proceedings FamilyName.FirstInitial. You should name your files `familyname.tex`, `familyname.pdf`, `familyname_fig1.ps`, etc to facilitate the task of the editors.

We note that color figures will appear in color at no charge in the electronic version of the proceedings only. For color figures in the printed proceedings, the publisher will charge the authors 500 GBP per page. Authors who are not prepared to cover this sum should ensure that their figures reproduce properly in black-and-white.

The page limits for the proceedings are indicated below. The editors may add one page to each oral contribution for questions and answers during the editing process. In this case authors will be consulted in due time after receipt of the manuscripts and preliminary editorial work.

### Page limits

- Review talks: 10-12 pages
- Invited talks: 8-10 pages
- Contributed talks: 4-6 pages
- Posters: 2 pages

## 16 Contacts

Scientific Organizing Committee:

Contact address:

Francesco Massaro, Chair of SOC;  
2575 Sand Hill Road  
Menlo Park, California, USA, 94025  
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Local Organizing Committee:

Contact address:

Ericson Lopez, Chair of LOC;  
Av. Gran Colombia s/n y Av. 10 de Agosto, Quito, Ecuador.  
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### **Credits for the poster images:**

- Cygnus A: Radio (LOFAR); X-ray (Chandra), credits: J. McKean, M. Wise, ASTRON; NASA.
- M87: Radio (LOFAR); optical (SDSS), credits: F. de Gasperin, LOFAR collaboration; SDSS.
- CTA 102: Radio (VLBA), credit: MOJAVE team and NRAO.