



## ISYA Program: past and future

Itziar Aretxaga (Mexico), ISYA Director

David F. Mota (Norway), ISYA Deputy Director



(42nd ISYA, Kunming, China, 2019)

# International School for Young Astronomers: background

- Organized by IAU since 1967
- Currently co-sponsored by Norwegian Academy of Science and Letters (NASL) and local host country
- Layout: 3-week intensive postgraduate school for parts of the world where students do not have access to a broad up-to-date astrophysics background (mainly, but not exclusively, from astronomically developing countries).
- Target population: isolated MSc to PhD students
- Goal: broaden the participants' perspective on astronomy
- Lecturers: researchers in faculty positions with international career paths, familiar with the region.







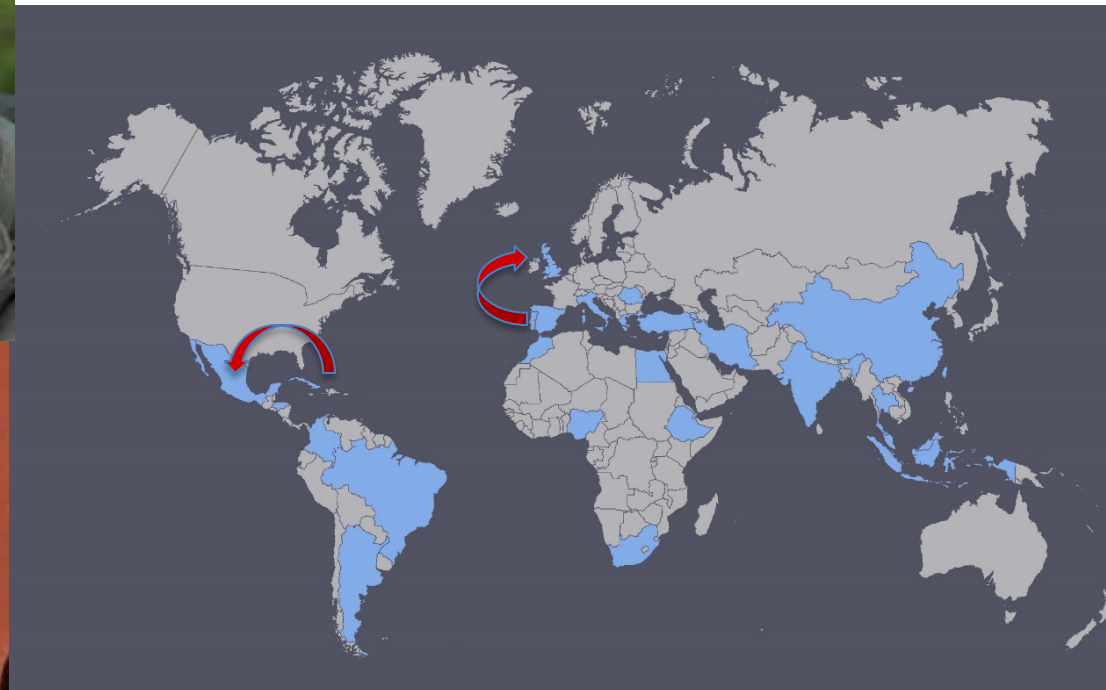
**José Ramón Valdés**  
Head of Dept. Astrophysics,  
INAOE, Mexico  
ISYA 1989 Cuba



**Eduardo Ojero**  
ESA, Villafranca,  
Spain  
ISYA 1979 Spain



**Mercedes Prieto**  
Full Prof., IAC, Spain  
ISYA 1979 Spain



# A case study: some successful stories

**Alfonso Aragón-Salamanca**

Prof. / Director of Teaching and Learning  
at the School of Physics and Astronomy,  
Nottingham Univ., UK  
ISYA 1986 Portugal



**Javier Armentia**

Director of Pamplona Planetarium  
Spain  
ISYA 1986 Portugal

53 years, 42 schools, 27 countries,  
1400+ students, 400+ lecturers





OYA  
OFFICE FOR YOUNG ASTRONOMERS

ISYA  
INTERNATIONAL SCHOOL  
FOR YOUNG ASTRONOMERS

FAMILY

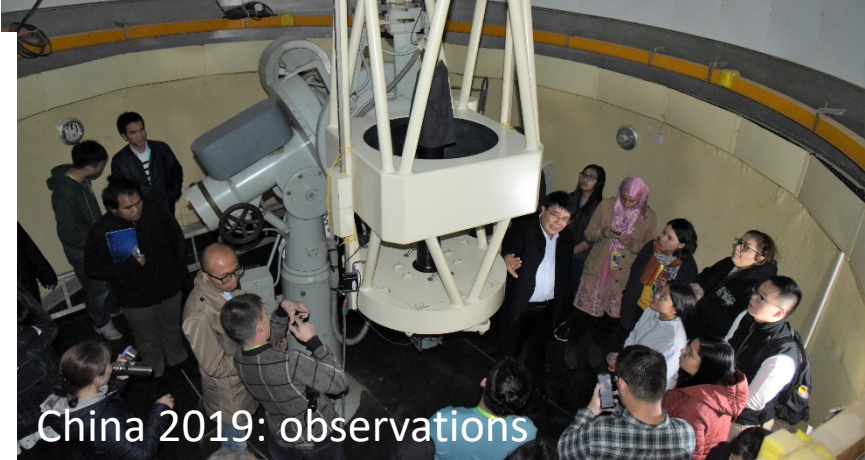




## Benefits for students:

- Contact with **international lecturers**: co-supervisions develop, students are recruited at lecturer's PhD school, ...
- Topics that complement their basic astronomy background.
- Access to **quality notes** on selected basic topics on astrophysics.
- **Practice** with basic bibliographic and virtual observatory tools.
- Some **observational experience**
- Workshops on Career Development and optional **mentoring**
- A **network** of fellow students to develop with into the new generation of astronomy professionals in the region
- Awareness of the **opportunities** they can access away from their countries of origin.

**THIS CANNOT BE DONE IN A VIRTUAL  
FORMAT VIA TELECONFERENCE**



China 2019: observations



Egypt 2018: data reduction lab



Ethiopia 2017: student presentations

# ISYAs today

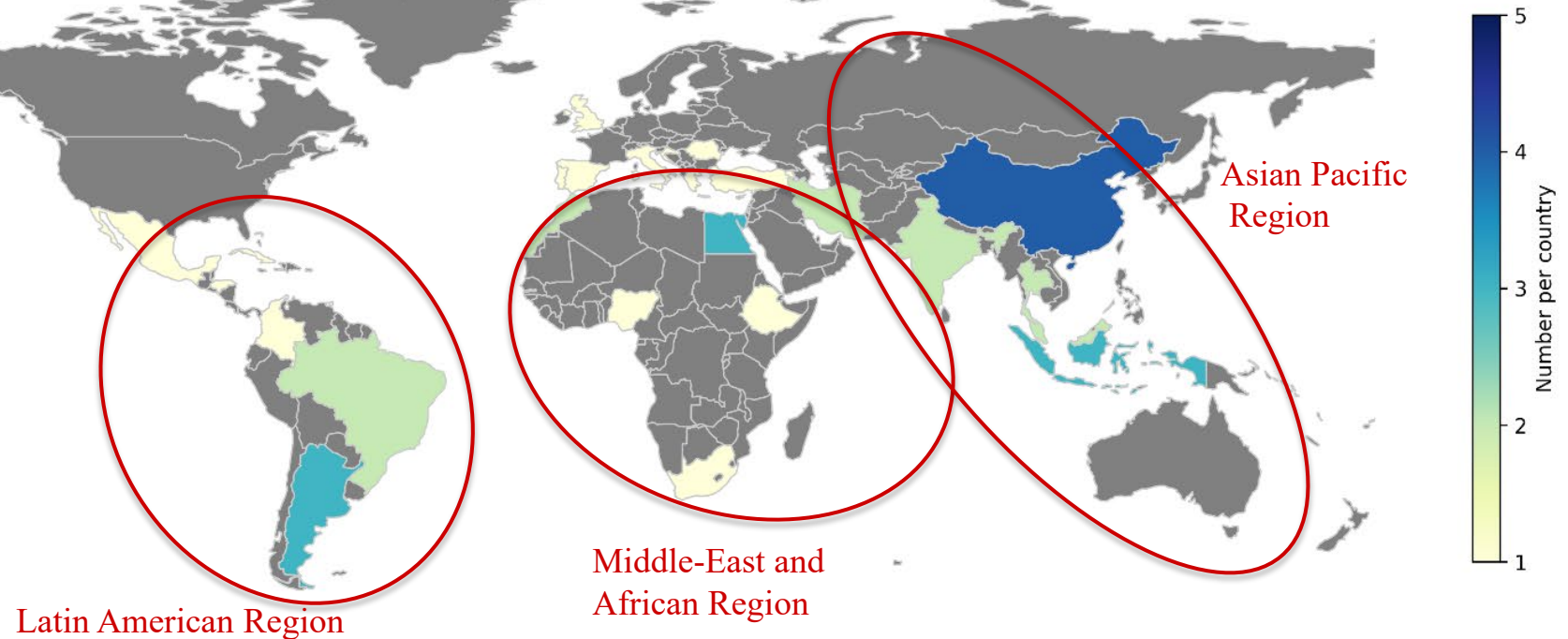
- Currently ~1 school / 8 months → 2 schools /yr
- Students: ~30-40 participants drawn from host country and region, with ~1/2 participating students coming from outside the host country, with gender balance.
- Lecturers: ~10 professors from around the world, active researchers in their topic. Gender and ethnic balance
- Since 2016, the OYA Steering Committee oversees the ISYAs for the Executive Committee and approves new schools.
- Geographical rotation: Middle East + Africa, Latin America + Caribbean, Asia Pacific + selected countries in Europe. Promote:
  - diversity among new hosts in developing countries
  - inclusion of developing regional poles

[https://www.iau.org/science/grants\\_prizes/iau\\_grants/international\\_school/](https://www.iau.org/science/grants_prizes/iau_grants/international_school/)

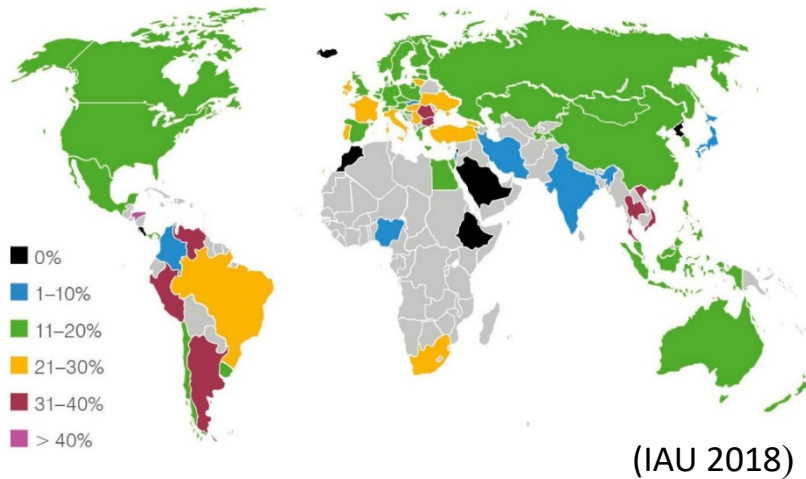
# A large expansion to happen

53 years, 42 schools, 27 countries, 1400+ students, 400+ lecturers

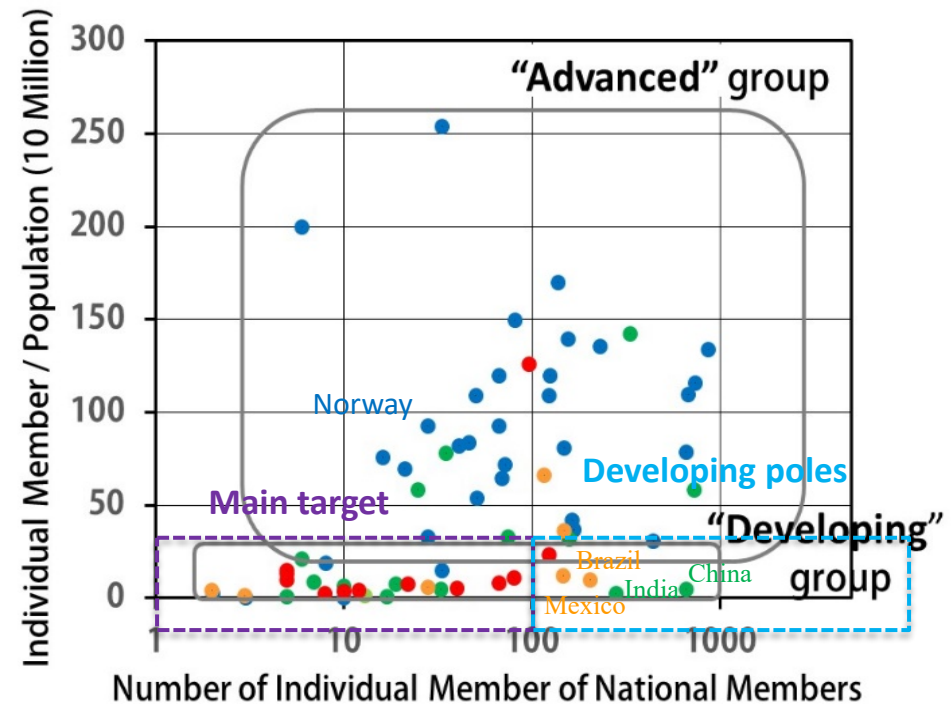
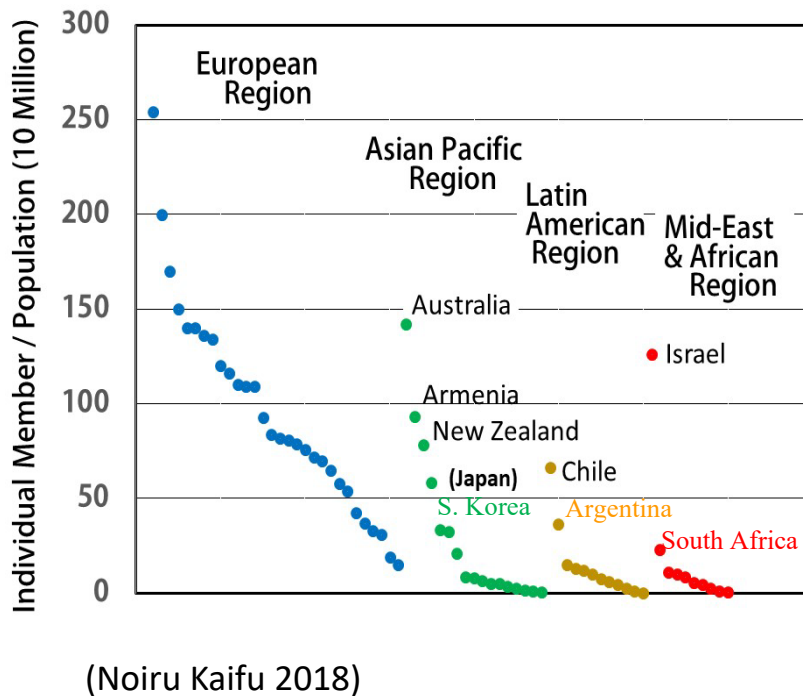
ISYAs 1967-2019



# What is our target population?



Analysis of IAU Regions  
(Noiru Kaifu 2018): Most of Asian Pacific, Latin American and Mid-East and African regions are included in the “Developing” group





# Database challenges



- OYA 2015 creation, Michele scanned all school reports and OYA made them available in ISYA web page.



- 2018 Itziar: in preparation for GA2018, all available information on lecturers and students into excel spreadsheets
- 2019 Some reports have missing information, like student lists, or are illegible -> Michele looking into other information in IAU Office (20% → 2% incomplete)



- David 2019 hires Jowita to debug the database and cross it with the IAU membership list and other online information (ongoing)

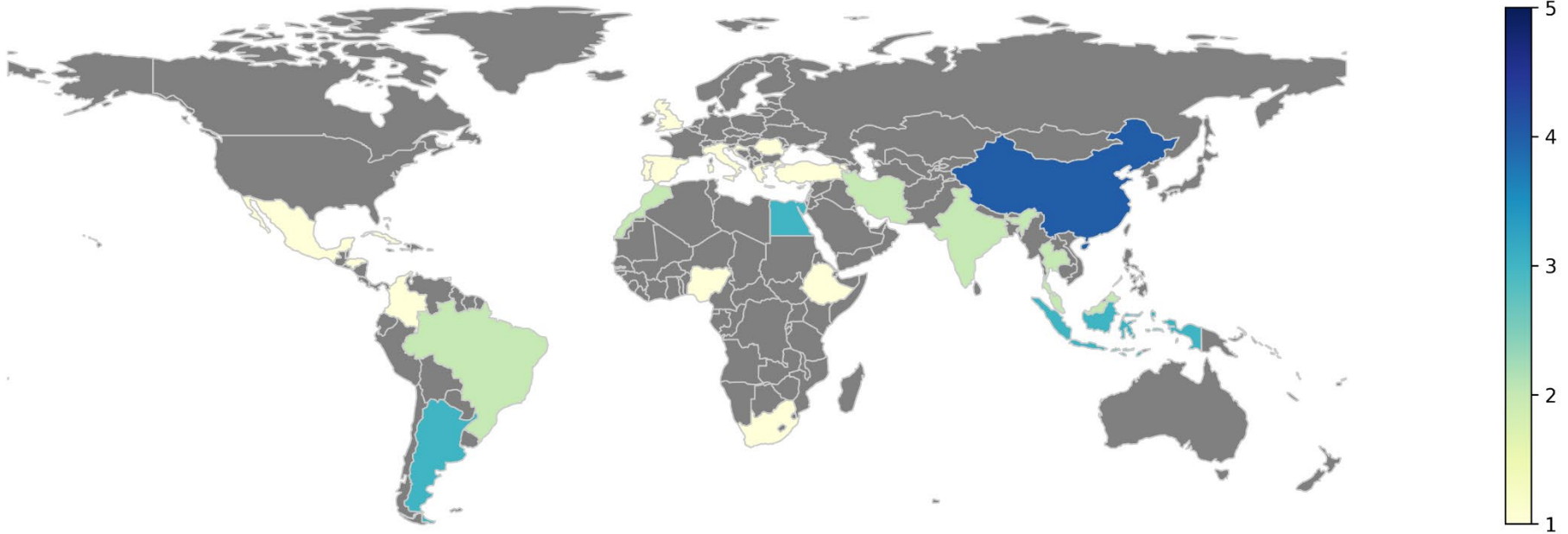


- Ongoing work:  
recovery of 2% students missing from database  
completing information on current status of alumni. This is done by web searches, asking alumni from same country, etc.  
Need extended OYA help.

# Location of schools

53 years, 42 schools, 27 countries

ISYAs 1967-2019

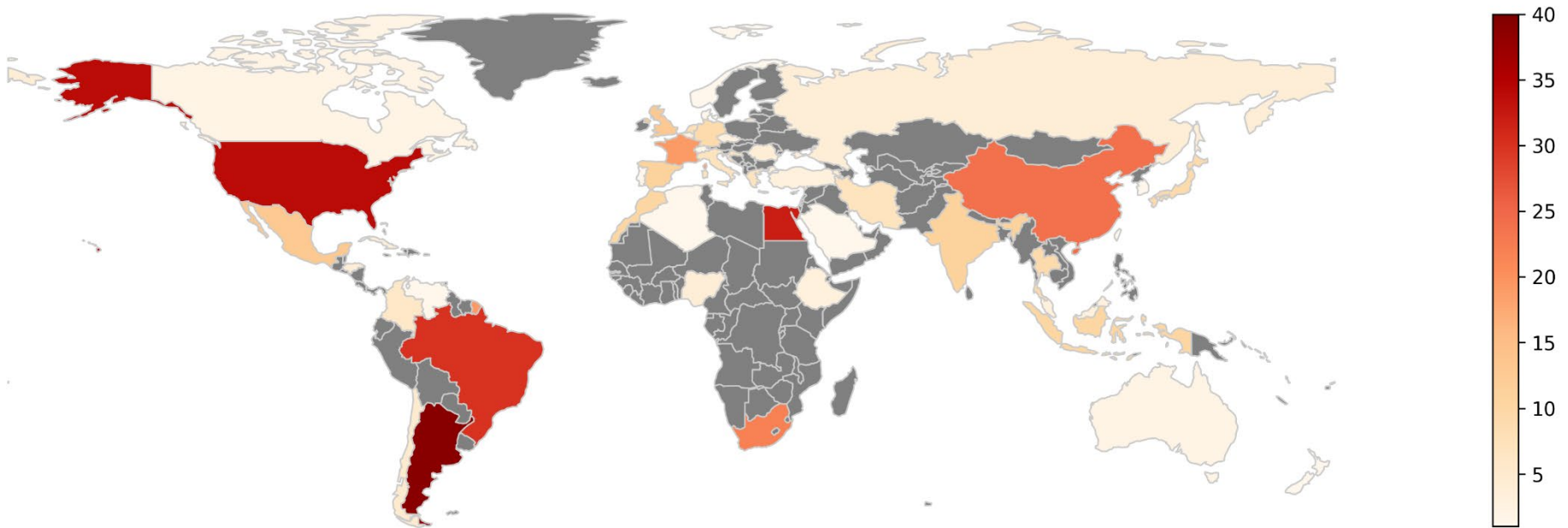




# Distribution of lecturers

53 years, 42 schools: 400+ lecturers from 44 countries

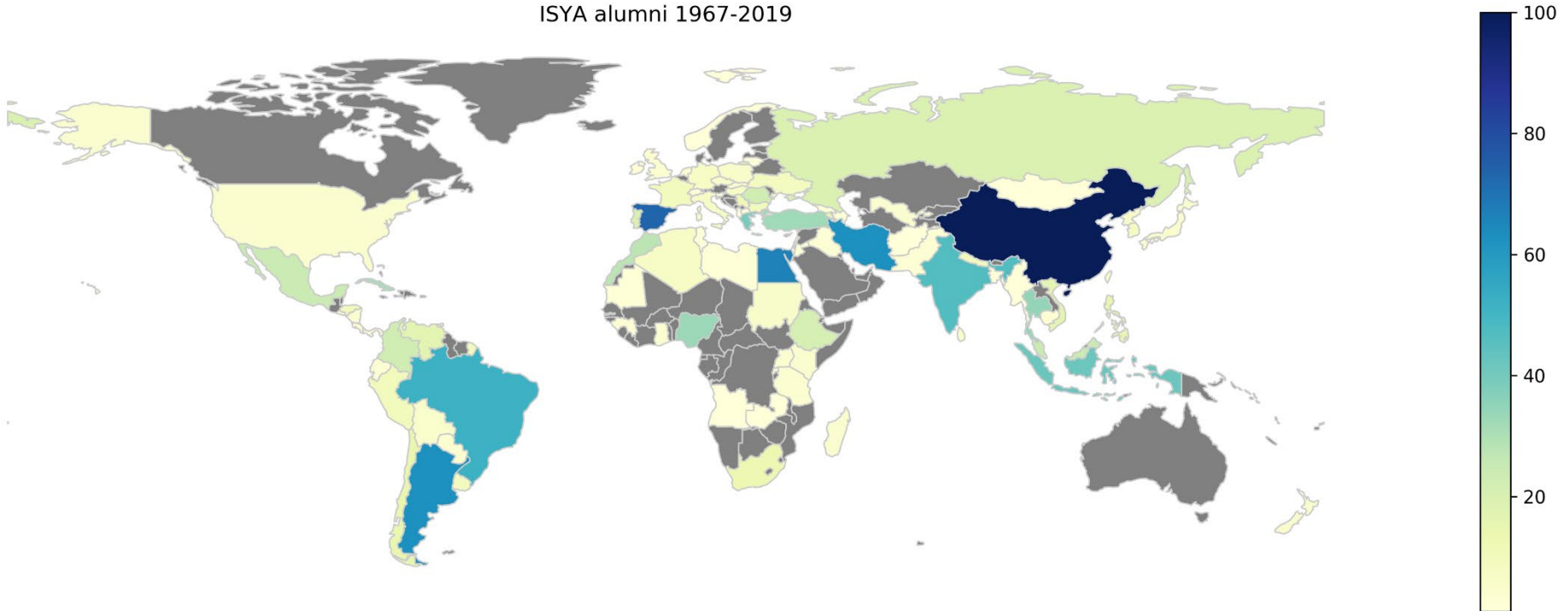
ISYA Lecturers 1967-2019



## Distribution of alumni

53 years, 42 schools: 1435 students from 94 countries

## ISYA alumni 1967-2019





# ISYA 2019 China: students

39 local/regional BSc/MSc/PhD students / 183 applications

14 countries, 54% women





# ISYA 2019 China: lecturers

16 world-wide experts  
10 countries, 31% women  
4 ISYA alumni as lecturers



David Jewitt (USA):  
Solar System



Shengbang Qian  
(China): Cataclismic  
Variables



Liying Zhu (China):  
Binary Stars



Xiaohui Fan (USA):  
Active Galactic Nuclei



Ewine van Dishoeck  
(Netherlands): ISM



Li Ji (China):  
X-ray Astronomy



David Mkrtichian  
(Thailand): Variable  
Stars



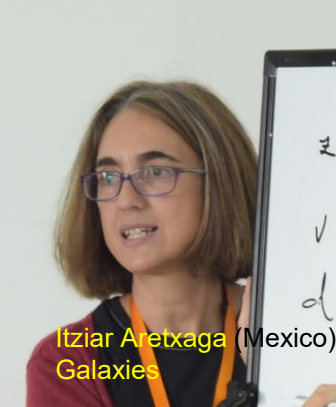
Wen-Ping Chen (Taiwan):  
Stellar Clusters



Naoki Yoshida (Japan):  
Stellar Evolution



Aeree Chung (S. Korea):  
Radioastronomy



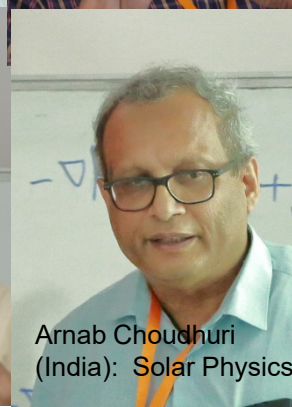
Itziar Aretxaga (Mexico):  
Galaxies



David Mota (Norway):  
Cosmology



Yogesh Wadadekar  
(India): Virtual Obs.



Arnab Choudhuri  
(India): Solar Physics



Jia Zhang  
Observational Astronomy

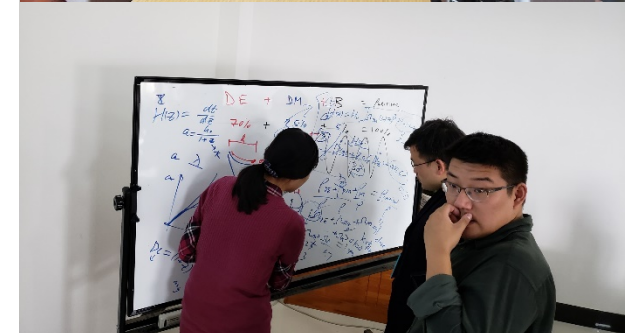


+ Liang Liu (China):  
Observational Astronomy

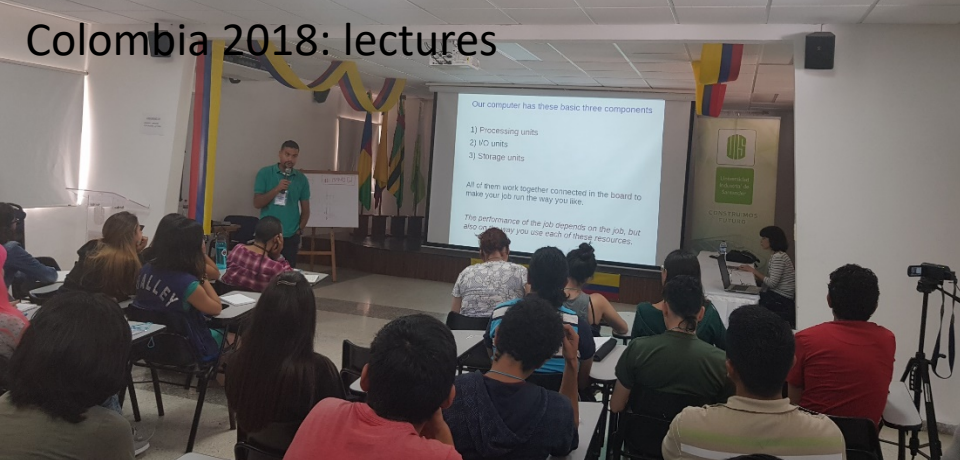


# School structure

- ~7 hrs/day of school work, including
  - seminal lectures
  - hands-on labs
  - observations
  - career development workshops
  - student presentations
- ~4 hrs/day for meals and coffee breaks, with informal interaction
- ~2 hrs/day of homework, to develop group projects (3-4 students together)
- Weekends for cultural tours and relaxing
- We encourage all students and lecturers to:
  - have all meals together
  - be housed in the same premises
- The student population is often very heterogeneous in level and experience. This is the biggest challenge for lecturers.







China 2019: career discussions



Iran 2016: group projects



Ethiopia 2017: student presentations



Colombia 2018: tutoring



Egypt 2018: culture

# Student Feedback




"I am really happy I could participate in this very nice and very helpful school. Everything and everyone [belonging] to this school gave me a lot of motivations and encouragements. I believe that we will collaborate in the future in astronomy. This school left me truly nice memories. I am wishing to all of you successful work, healthy body, peaceful mind and soul."

"Thank you all the lecturers. I love many of you. You helped me to understand many things and encourage me to strengthen my research, and give more chances for us to do the presentations, and we acquired big progress during this time. At last, I want to thank the LOC, thank you very much. "

"This training workshop is one of the best training I attended."

"Thank you LOC, you took care of us very well. Thank you for everything. Thank you [to] every lecturer. I got [much] motivation in my astronomy career. I truly appreciate."

*"En [#ISYA41Col](#) no solo lo académico ha sido enriquecedor, imagínense todas las palabras nuevas y todo lo cultural que hemos aprendido. [#Chile](#) [#Peru](#) [#Colombia](#) [#Pereira](#) [#Socorro](#) [#Medellin](#) [#DontBE...](#)" (At ISYA the academic aspects have not been the only enriching experience, think of all those new words and cultural aspects we have learned)*

Tomorrow is the beginning of the last week of the [#ISYA41Col](#). I don't know how to deal with that.  [#astronomy](#)  

We are going to observe 5 Quasars tonight, yay! [#ISYA41Col](#) [#ISYA2018](#) [@IAU\\_org](#)

I love professors who get excited explaining. [#ISYA41Col](#) [#ISYA2018](#)

The emotion keeps me awake. [@GisselMontaguth](#) [#ISYA41Col](#) [#ISYA2018](#)

I do not know about you but this kind of thing makes my knees tremble with emotion. left: [Hertzprung Diagram\(1911\)](#). right: [Russell Diagram\(1914\)](#) [#ISYA41Col](#) [#ISYA2018](#)

I am so glad and surprised for the incredible female representation in [#ISYA41Col](#). Thank you so much [#ISYA2018](#)



# Student Feedback

The “blackboard” lectures were a very useful part of the ISYA training

The hands-on laboratories were a very useful part of the ISYA training

The time spent on the lectures/labs was right

I could follow most of the lectures/labs well

The lectures/labs were well presented

The lecturers responded well to my questions

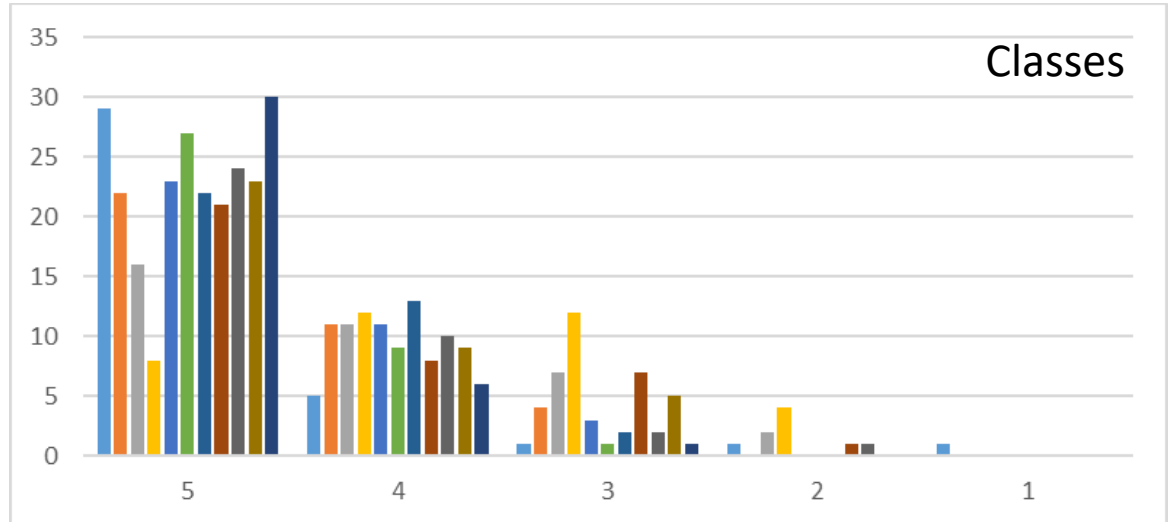
I have identified in this school material I need to study further

I found it easy to get on with the lecturers

The lecture room was comfortable

I think there was a good balance of hands-on and seminal lectures

I found the Career Development, Job hunting, CV/paper writing, Ethics workshops useful



The group project was challenging but I learned about the topic and about working in a group environment

The time spent on projects was right

The lectures prepared me adequately for the project

The computing arrangement was good to make progress

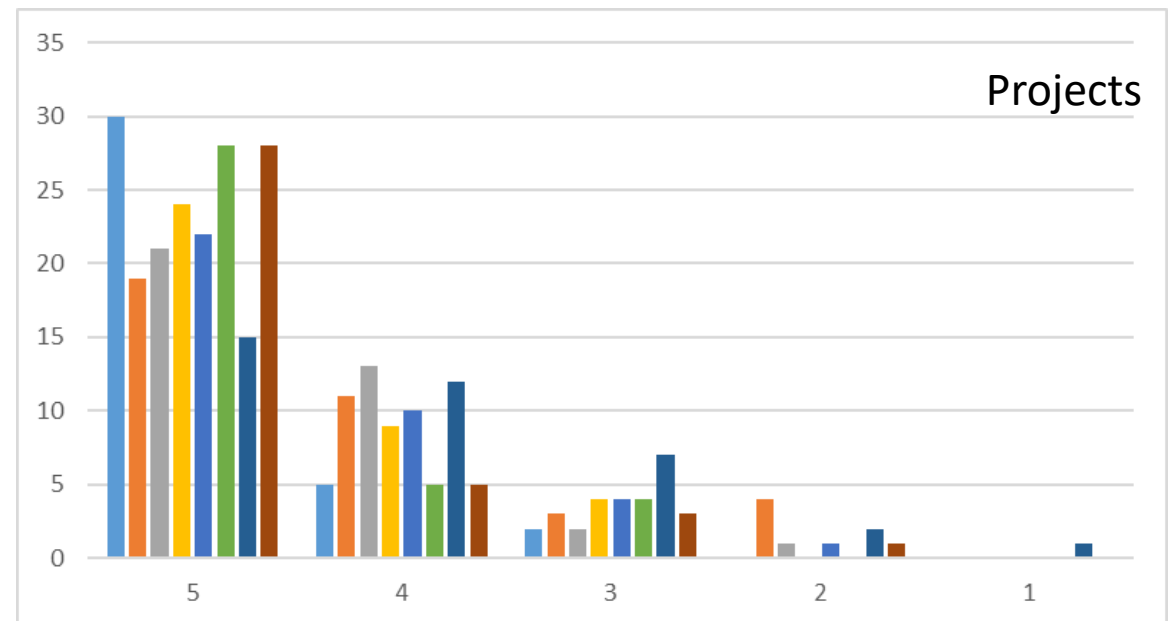
The tutoring I got for my project was adequate

I found the project supervisors helpful and easy to get on with

The observing nights were good training for me

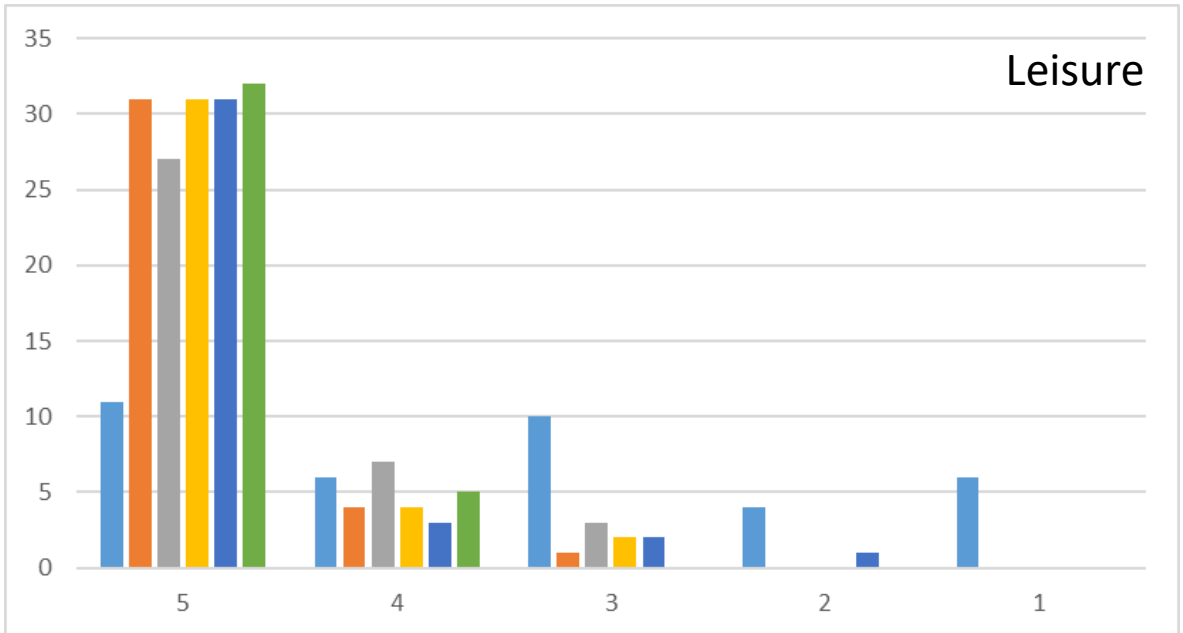
It would have liked to have more observing

training

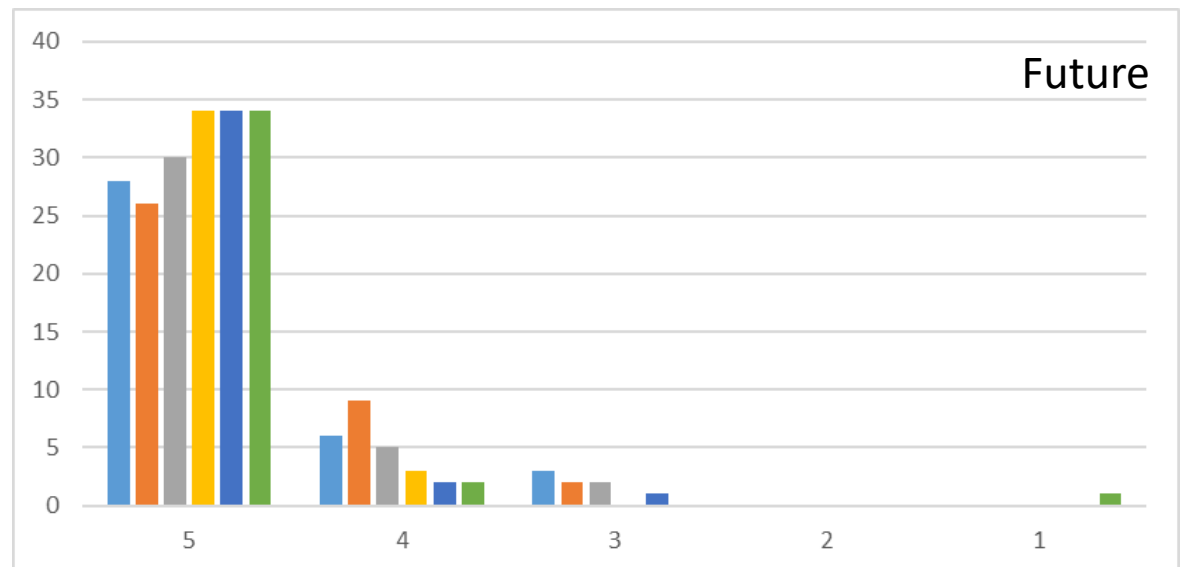


# Student Feedback

There was enough leisure time in this school  
 Having a free morning on Saturday 19th was good  
 The Saturday 19th Golden Temple tour was good  
 The Sunday 20th excursion to the Nationalities Village was good  
 The weekend excursion and free time in Lijiang was good  
 Generally, this part of the ISYA was good



I developed an international network as a result of this ISYA  
 The ISYA helped me to better identify and understand my research interests  
 The ISYA encouraged me to strengthen my research in astronomy  
 Through the ISYA I acquired a broader view on the research done in astronomy  
 I have benefited significantly from attending this ISYA  
 I would recommend fellow students to apply to the next ISYA in the region



# ISYAs: the future

2020: South Africa / Mexico

2021: Algeria & Nepal, working on proposals, not yet submitted

Looking for hosts for ~2022 onwards, interest from UAE, Nigeria, Bolivia, ...

Selection of topics for each school are tailored to regional needs: optical astronomy, high-performance computing, radioastronomy, high-energy astronomy,... Access to observatories is encouraged but not compulsory

Further relations increased with OAD, OAO, OAE and other school programs:

- Classical observations based research school
- Skill development (1/3) and research (2/3) school
- Education and outreach (1/3) and research (2/3) school

Mentorship program:

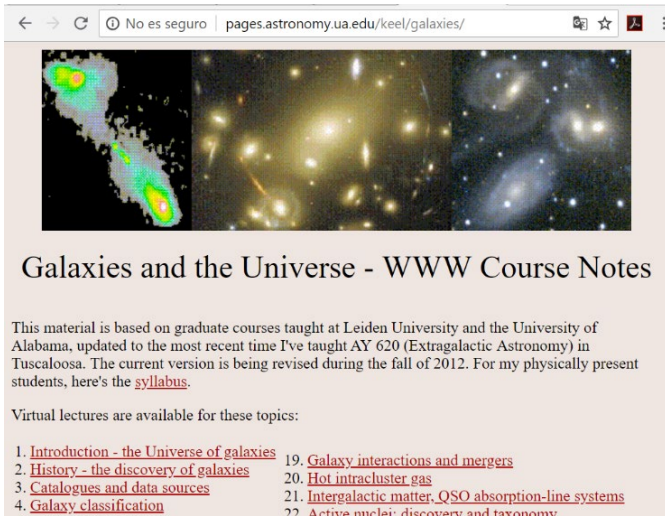
- Frequent announcements about advanced schools and PhD programs through email exploders & ISYA alumni Facebook page
- upon request, personalized mentorship by IAU members / lecturers

Follow-up of alumni: feedback reports after ~5 yrs not yet implemented. Need OYA assistance.



# ISYAs: Some further actions needed

## Free / Low-cost textbooks



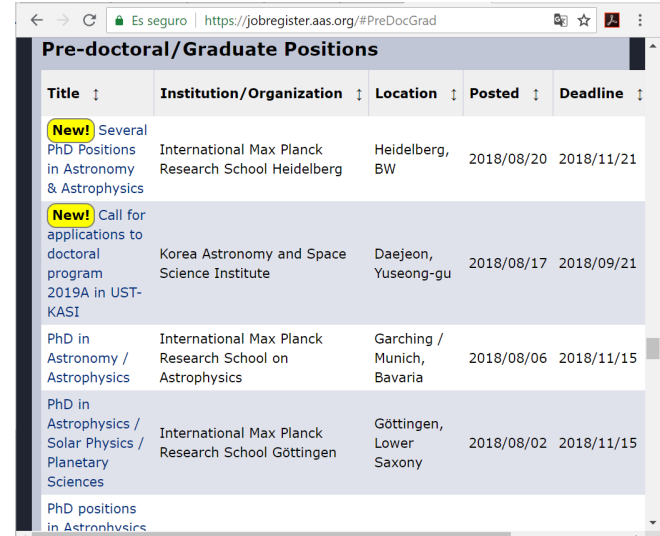
Galaxies and the Universe - WWW Course Notes

This material is based on graduate courses taught at Leiden University and the University of Alabama, updated to the most recent time I've taught AY 620 (Extragalactic Astronomy) in Tuscaloosa. The current version is being revised during the fall of 2012. For my physically present students, here's the [syllabus](#).

Virtual lectures are available for these topics:

1. [Introduction - the Universe of galaxies](#)
2. [History - the discovery of galaxies](#)
3. [Catalogues and data sources](#)
4. [Galaxy classification](#)
19. [Galaxy interactions and mergers](#)
20. [Hot intrachuster gas](#)
21. [Intergalactic matter, QSO absorption-line systems](#)
22. [Active nuclei: discovery and taxonomy](#)

## Grad School Registry



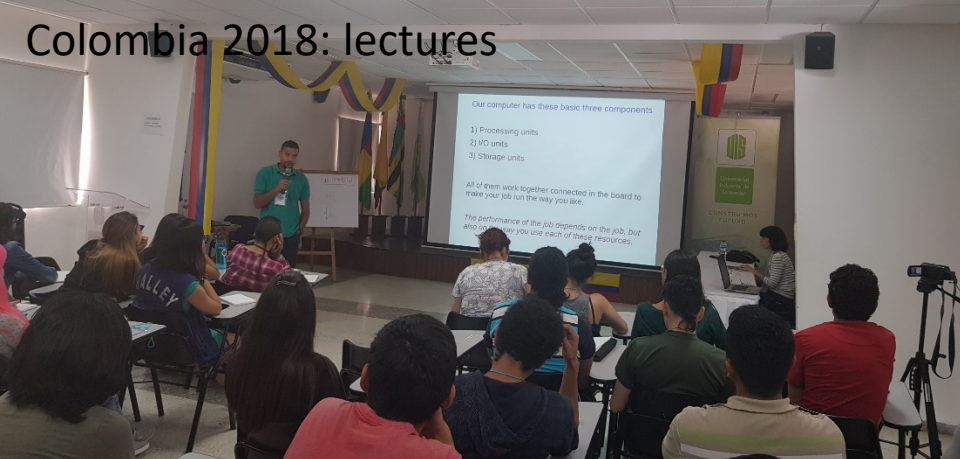
Title	Institution/Organization	Location	Posted	Deadline
<b>New!</b> Several PhD Positions in Astronomy & Astrophysics	International Max Planck Research School Heidelberg	Heidelberg, BW	2018/08/20	2018/11/21
<b>New!</b> Call for applications to doctoral program 2019A in UST-KASI	Korea Astronomy and Space Science Institute	Daejeon, Yuseong-gu	2018/08/17	2018/09/21
PhD in Astronomy / Astrophysics	International Max Planck Research School on Astrophysics	Garching / Munich, Bavaria	2018/08/06	2018/11/15
PhD in Astrophysics / Solar Physics / Planetary Sciences	International Max Planck Research School Göttingen	Göttingen, Lower Saxony	2018/08/02	2018/11/15
PhD positions in Astrhnvsics				

## Family Mobility Grants





Colombia 2018: lectures



China 2019: career discussions



Iran 2016: group projects



Ethiopia 2017: student presentations



Colombia 2018: tutoring



Egypt 2018: culture

