

41st ISYA at Socorro, Colombia, 8-28th of July 2018

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Summary

The 41st ISYA was hosted by an alliance of Colombian universities (Los Andes, Antioquia, ECCI, Industrial de Santander, and Nacional) together with the Andean Regional Office of Astronomy for Development (OAD). The school intended to train early graduate students in Physics/Astronomy/Astrophysics especially, but not exclusively, in the Andean region (Venezuela, Colombia, Ecuador, Peru, Bolivia and Chile).

The school activities were published in the webpage that the Colombia universities designed within their national server: <https://eventos.redclara.net/indico/event/842/overview>

Venue

The school was held within the premises of the Universidad Industrial Santander (UIS) in its Socorro campus, province of Santander. The school had a large Auditorium for “blackboard” classes and a computer lab room with about 30 computers with all necessary software for practical sessions. Apart from these, lecturers and students had two large rooms to work on any spare time and all the coffee area of the university, which was on holiday season.

All lecturers and students were hosted in the same hotels and residences, close to the University, and all meals were served at the UIS premises.

Socorro is a ~35,000-inhabitant historical town in the province of Santander, about 3 hrs away by bus from the capital, Bucaramanga. The center of town was within walking distance from UIS and hotels.

Organizers

DIRECTORS

Luis Alberto Núñez (local director, UIS)

Kam-Ching Leung and Itziar Aretxaga (ISYA program director and deputy director).

LOCAL ORGANIZING COMMITTEE

Luis Alberto Núñez (UIS, chair)

Esteban Silva Villa (Univ. Antioquia)

Germán Chaparro (Univ. ECCI)

Santiago Vargas (Univ. Nacional)

Fabio Duván Lora Clavijo (UIS)

Jaime E. Forero-Romero (Univ. De los Andes)

Carlos J. Barrios-Hernández (UIS)

Mario Armando Higuera (Univ. Nacional de Colombia)

Julio Martínez (UIS)

Giovany Monsaleve Villareal (UIS)

Announcement

The school was advertised through the regional network of the OAD, based in Colombia, and through social media of the IAU and the ISYA All Alumni page in Facebook. Announcements through email were also sent to prominent astrophysicists/IAU representatives in all IAU member countries in Latin America and Caribbean countries. We made a special effort to clarify that regional students in Latin America and the Caribbean countries were to be preferentially selected, and that the school was targeting graduate students and advanced BSc students already doing research. This decreased the number of applications of students that would have been disqualified based on remoteness or academic background.

Student Selection

We received 90 complete applications through the school webpage, 82 of which were from valid regional countries, and 8 were from non-regional candidates in Armenia, India, Iran, Nepal, Malaysia, Philippines and South Africa. The distribution of regional candidate applications (App), initially accepted (Acc) and finally attending (Att) students was as follows:

COUNTRY	App	Acc	Att
Brazil	8	3	3
Chile	4	2	2
Colombia	44	16	16
Costa Rica	1	1	0
Ecuador	4	3	1
Honduras	2	1	1
Mexico	1	0	0
Peru	6	3	3
Venezuela	12	6	6

The selection of students was done by a small committee of 2 local organizers (L. Nuñez and J. Forero) and the ISYA director and deputy director. There were many more deserving candidates than available places at the school. We initially aimed at having 35 students for the school.

We had a few cancellations by accepted students: 3 international student and 4 national students. These were replaced by students in the waiting list whenever possible. The final list of 32 attending students to the ISYA can be found in Appendix A.

The distribution of students was 50% national and 50% regional, with a gender split of 50% female and 50% male students.

All but two BSc students were carrying out research for their BSc, MSc or PhD theses before the school started. The split of levels was: 11/32 BScs, 18/32 MSc students and MSc/PhD candidates, 2/32 1st-yr PhDs and 1 recently graduated PhD.

Lecturers and Scientific Program

Lecturers were selected by the local and ISYA program directors to meet the needs of the proposed program, which had an emphasis on high-energy, computational and data mining astrophysics. A balance of blackboard and practical hands-on classes was achieved, with practical classes being mostly in the afternoons. The initial selection of lecturers, their topics, final assignation of time and gender was as follows (alphabetical order):

- *Itziar Aretxaga* (Inst. Nacional de Astrofísica, Óptica y Electrónica, Mexico): Active Galactic Nuclei [2 x 1.5 hrs], and career development workshops (F)
- *Rodolfo Barbá* (Univ. de La Serena, Chile): Virtual Observatory [6 x 1.5 hrs] (M)
- *Gustavo Bruzual* (Univ. Nacional Autónoma de México): Galaxies [6 x 1.5hrs] (M)
- *Leticia Carigi* (Univ. Nacional Autónoma de México): Interstellar Medium and Chemical Abundances. [4 x 1.5 hrs, cancelled] (F)
- *Jaime Forero Romero* (Univ. de Los Andes, Colombia): General Astronomical Software: Linux Basics, Visualization, Python R Basics. [5 x 1.5hrs] (M)
- *Elisabete M. de Gouveia Dal Pino* (Univ. Sao Paulo, Brazil): Magnetohydrodynamics [5 x 1.5 hrs] (F)
- *Kam-Ching Leung* (Univ. of Nebraska, USA): Supernova Ia and Emission-line Stars [2 x 1.5 hrs], and career development workshops (M)
- *Juan Rafael Martínez-Galarza* (Harvard-Smithsonian Center for Astrophysics, USA): Astrostatistics, Data Analysis and XRay Astronomy [6 x 1.5 hrs] (M)
- *Karín Menéndez Delmestre* (Obs. Valongo, Brazil): Observational Astronomy and Data Reduction. [5 x 1.5 hrs + a whole night of observations] (F)
- *Dante Minniti* (Univ. Andrés Bello, Chile): Exoplanets and planet formation [3x 1.5hrs, cancelled] (M)
- *Juan Carlos Muñoz-Cuartas*, (Univ. de Antioquia, Colombia): High Performance Computing, Big Data and Machine learning [7 x 1.5 hrs, + group projects] (M)

- *Karla Peña Ramírez* (Univ. de Antofagasta, Chile): Stellar Structure, Evolution and Atmospheres [5 x 1.5 hrs] (F)
- *Héctor Rago* (Univ. Industrial de Santander, Colombia / Univ. de Los Andes, Venezuela) (M) & *Ysabel Briceño* (Univ. Autónoma de Bucaramanga Colombia) (F): Science Communication [3 x 1.5 hrs]
- *Jorge Armando Rueda* (ICRANet, Italy): Relativistic Astrophysics. [4 x 1.5 hrs] (M)
- *Octavio Valenzuela* (Univ. Nacional Autónoma de México) Cosmology [6 x 1.5 hrs] (M)

We, thus, initially had 16 lecturers (including the ISYA program director and deputy director): 2 from Brazil, 3 from Chile, 4 from Colombia, 1 from Italy, 4 from Mexico and 2 from the USA. Regional lecturers were mainly selected to balance the budget. The initial gender split among lecturers was 38% female, 62% male.

Dante Minniti and Leticia Carigi cancelled their participation in the last minute due to health problems, and their lecturing slots were replaced by an extension of lectures by Rodolfo Barbá, Juan Carlos Muñoz Cuartas, Jorge Rueda, Octavio Valenzuela, an extra lecture by

- *Luis Núñez* (Univ. Industrial Santander, Colombia): Astroparticles @ Eastern Colombia (M)

and a Work Ethics workshop led by Itziar Aretxaga.

The final schedule of classes and activities is detailed in Appendix B. The final gender balance for lecturers was hence 31% female, 69% male.

Academic activities included a session of remote observations with the Brazilian 1.6m Perkin-Elmer optical telescope of Observatorio Pico dos Dias in Minas Gerais (Brazil) in the evening of Friday 13th, led by Karín Menéndez Delmestre (Obs. Valongo, Brazil), and a set of computational/data mining projects that groups of 3 to 4 students had to conduct during homework time (marked in the schedule, after dinner) and present by the end of the school. Group projects were designed and tutored by Juan Carlos Muñoz-Cuartas (Univ. Antioquia, Colombia). The groups were designed by school directors to enhance the mix of students from different countries and backgrounds. This was often the first time that students had to work in a group and coordinate among themselves how to carry it through. The same groups were adopted for other hands-on activities throughout the school.

The program also included a series of 4 workshops on Career Development, including discussion sessions and presentations on CV writing, application for jobs/schools, challenges such as impostor syndrome and implicit biases (gender and other minority biases), and work ethics.

At the end of the school, we had 3 sessions of student presentations for group projects and we performed a roster of 2-min flash talks on their individual research projects that they are carrying out at their universities for their degrees. All students were asked to give a flash talk. The two BSc students that did not already have a thesis project, chose a topic of their liking to talk about. These short talks prepare them for quick presentations of poster results at conferences. For most students these sessions were the first opportunity they had to speak in English in public.

The list of projects and individual presentations is included at the end of Appendix C.

Development of the School

All students arrived and departed as scheduled for the school. Most students and lecturers arrived at the Bucaramanga airport and from there took a 3-4hr-long bus ride to Socorro. Other lecturers opted for Bogotá airport, 7-8 hrs away by bus from Socorro. Colombian and Venezuelan students travelled to Socorro by ground transportation from their home cities. This was especially grueling for the Venezuelan students due to the difficulties in maintenance of ground transportation in their country and tight road and border controls, but this was the only option to bring them to the school, as flying had become prohibitively expensive. Although tired, they were happy to take the route.

The activities in the school were carried out according to plan for most lecturers, with some minor scheduling changes, and the notable exception of the cancellations of the lecture courses on Exoplanets by Dante Minniti and Interstellar Medium by Leticia Carigi. The gaps in the schedule were recovered by an extension of lectures and workshops by Octavio Valenzuela, Jorge Rueda, Luis Núñez, Juan Carlos Muñoz Cuartas, Rodolfo Barbá and Itziar Aretxaga.

All lecture notes were made available to the students in pdf format and/or python Jupyter notebooks through the school platform.

The final schedule was packed with activities, and students complied diligently with all of them, and stayed at the UIS premises working Monday to Friday. We gave them explicit instructions not to work after 10pm and rest on weekends to avoid burn-out with the academic activities. Most students stayed at UIS premises working late at night though, especially close to the student presentations deadline.

On Wednesday 25th, we had to program a business trip to the nearby town of San Gil for travel reimbursements to be cashed. The corresponding morning school activities were shifted to Saturday 21st.

Observing time was successful, with a very stable UIS network, and the students carried out a series of photometric observations of QSOs to look for micro-variability. Based on

these observations, they practiced data acquisition planning, data reduction, and photometric techniques within their Observational Astronomy class. Other classes that included data-handling and the use of databases were Virtual Observatory, Astrostatistics and X-ray astronomy, High Performance Computing, Big Data and Machine learning, and General Astronomical Software.

Most graduate students had a good command of English to interact with lecturers and fellow students, and the BSc students had more diverse language levels. While formal academic activities were carried out in English, informal communication out of the classroom was more often than not carried out in Spanish and Portuguese, the mother tongue of the students, or a mix of both (Portuñol). All students were able to make very insightful questions to the lecturers, even BSc students.

We allowed for the Scientific Communication hands-on classes to happen in Spanish (all other courses were carried out in English), as the lecturers advised the practical sessions to happen in the mother tongue of the students, since they would normally use their mother tongue to communicate with the public. The Brazilian students could follow the class but had a tutor in English for questions and they carried out their exercises in Portuguese. The science communication exercises focused on short text writing for the general public. The final exercise consisted on composing 5 short messages that described their BSc/MSc/PhD theses. Most of the texts were sent via Twitter and Facebook, as these are the social networks they natively used (1/2 of the students had Twitter accounts and all had FB accounts). One of the students gathered with her thread of 5 tweets more than 200 interactions in Twitter and reached 8000+ readers in a time lapse of ~36 hrs.

Social media (Whatsapp, Facebook and Twitter) was also used for both internal communication and outreach throughout the school. We posted some photographs and news in the IAU All Alumni Facebook page and in Twitter with the hashtag #IAU41Col and #EISocorro.

Three students fell ill due to minor complications (stomach problems and colds) and one due to a pre-existing condition (asthma), and were shifted to the local hospital for medical attention. This was covered by a UIS purpose-acquired health insurance for the school.

Two UIS tourist-professors took care of all local organization during the whole event, supervising food, hotels and local needs. UIS designed this so that they could act as observers in order to establish the UIS-Socorro campus as a venue for future conferences and schools.

Complementary Activities

On Wednesday 11th and 18th of July public Astronomy Movie and Forums were conducted at 19:30 by Héctor Hernández (UIS professor). These were attended by general public and ISYA participants alike.

Saturday 14th and 21st at 19:30 public talks were delivered to the general public by ISYA lecturers in the main square of Socorro:

- Gustavo Bruzual on *“Nosotros, las galaxias y el Universo”* (Us, the Galaxies and the Universe)
- Héctor Rago on *“Diario íntimo de una onda gravitatoria”* (The Private Diary of a Gravitational Wave)

Cultural activities included a guided tour to the historical center of Socorro, and a tour to the nearby historical cities of Barichara and Guane.

The start of the school was covered by local media, in paper and TV, present at the opening:

<http://www.vanguardia.com/santander/comunera/438381-socorro-sede-de-encuentro-de-jovenes-astronomos-en-la-uis>

<http://www.uis.edu.co/webUIS/es/rss/noticiaMovil.jsp?id=9484&canal=canalComunicaciones.xml>

Students' Feedback

The direct transcription of the students' feedback forms can be found in Appendix D. We present here the directors' analysis and some comments selected from the students.

The students in general found the application procedure OK, but made some suggestions about providing more logistics information on the web page before the school starts.

The students value the lecture content and lecturers very positively. There are more students that thought that the lecture program was too long than not, although the spread is significant (12 yes, 10 ambivalent, 8 no). Most of them indicate they could follow the lectures well (25 yes, 5 ambivalent), although they also tend to indicate that the level was too high (13 yes, 10 ambivalent, 7 no), which seems like a contradiction. The question should be rephrased in future feedback forms. They also found that the balance between blackboard and hands-on sessions was right and they found the career development workshops very useful.

The group project was valued positively both in content and in the tutoring and preparation they got for it. The time spent on it (~2hrs per day after classes) was valued as right by most students (19 yes, 7 ambivalent, 4 no). Some students were very vocal about needing more

time for completing the project, but the project tutor (Juan Carlos Muños Cuartas) and directors told them that they did not need to complete it to perfection, but to a level of understanding that could be explained in the presentation sessions at the end of the school. The projects were indeed challenging for most groups.

The 1-night remote observing experience was valued positively, and more students than not would have liked to have more extensive observational experience (23 yes, 2 ambivalent, 4 no).

Student presentations were valued positively, both for group projects and for individual presentations. Although a student mentions that (s)he would have liked to know about this exercise beforehand to prepare the viewgraphs, the students need some coaching to understand how to do a 2-minute talk, and that happens during the school. They are also allowed only one viewgraph.

School transportation, accommodation and food were in general valued positively. Food was catered by one of the best restaurants in Socorro, and the local organizers asked for formal feedback on these topics after the first week of the school to make adjustments.

There is a large spread in the students' perception of the availability of free time: 15 think there was enough, 6 are ambivalent, 6 think there was not. The academic program was indeed heavily packed by design, and although the students looked tired by the end of the school, they also seemed to enjoy their breaks and weekends.

The students unanimously found that the ISYA has been beneficial for their future development as astronomers and for better identifying their interests.

Selected comments by students in their feedback forms:

- In general the ISYA school was very complete and full with new knowledge. I have learned new areas of research and it was possible to improve the way of my master thesis.
- Thanks for all! I really learned a lot about astronomy. I met many good classmates and teachers. I won't forget the moments I had here.
- I found it really useful for my future research to share ideas with teachers and other students
- ISYA was a great experience that helped me to understand what topics I would like to research in my future studies (i.e, Master and PhD)
- I am very grateful for accepting me in the ISYA school. I have found the necessary guidance to start my masters project. I am very happy to have had the opportunity to meet experts in topics of Astrophysics and Cosmology.
- The teachers really easy to get along with and very open to collaborate, which I particularly found very nice.
- I really learned that teamwork can be difficult but not impossible .I really loved the exercise of individual presentations. I shall follow the work to improve the time to get down to "1 minute time" for an individual presentation.

Further selection of comments written by students in Twitter, in the public domain, along the three weeks (in inverse time order):

Cómo extraño la escuela... Rendir al máximo porque te apasiona y deseas mostrar lo mejor sin necesidad de notas. [#ISYA41Col](#) [#ISYA2018](#) (I really miss the school... Give your best because you are enthused and wish to show your best without the need to look for scores)

And with my bad English :v but I really liked this challenge. [#ISYA41Col](#)
(about the two-minute flash talks)

[#ISYA41COL](#) sigo ratificando mi gusto por la astrofísica en especial por la [#AstrofísicaObservacional](#) (I am reassured of my liking for Astrophysics, and specially for Observational Astrophysics)

"En la escuela me he dado cuenta que en algún punto de mi vida académica quiero trabajar en cosmología computacional. [#ISYA41Col](#)" (In the school I have realized that at some point in my academic development I want to work on computational cosmology)

"It's amazing to see that each person has his style to communicate science. [#ISYA41Col](#)"

Today at [#ISYA41Col](#) we studied my tweets 😊

"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: Hertzsprung 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](#)

Segundo dia da 41ª Escola Internacional para Jovens Astrônomos [#ISYA41Col](#). Hoje, além das aulas, tivemos um workshop sobre "Career Development", na construção de Carta de Aplicação e Curriculum Vitae. Levo daqui dicas pra vida e muitas novas amizades <3 (2nd day at the ISYA. Today, in addition to the classes, we had a workshop on "Career Development", in the construction of Application Letter and Curriculum Vitae. I take from here tips for life and many new friendships)

Lecturers' Feedback

The direct transcription of the lecturers' feedback forms can be found in Appendix E. We present here the directors' analysis and some comments gathered from them.

The lecturers unanimously valued their experience at ISYA as a positive one, and their time as well spent in advancing the opportunities of the students in the region. They also found the spread of levels in the students challenging to deal with.

Selected comments by lecturers:

- I found a group of extremely interested students and in addition they had very good level and background in physics. I am really happy of having participated as a lecturer of such a nice group of students. I enjoyed very much answering their very interesting questions both in the room and at coffee breaks!
- I was impressed by the students' commitment and dedication — the school organizers certainly did a good job not only selecting good students, but also immediately conveying to the students since day 1 that the school was going to be demanding and that they were there after a careful selection of candidates... commitment and dedication were necessary!
- It was a pleasure to participate in such a worthy effort to spread high-quality professional astronomy education to advanced undergrads and grad students. I would be happy to participate again in the future!

Directors' Summary, Assessment and Recommendations

The directors are extremely pleased with the development of the school and the commitment of lecturers and students to make the most out of the three weeks. Happy-tired faces were the norm at the school.

The submission of student applications was efficiently done through the university web page. It was also helpful to ask for a free-format CV of the students, apart from the usual questionnaire and letters of reference to make the selection.

The directors were surprised that there were not sufficient (or any) applications from Argentina and Mexico, considered strong in astronomy in the region, nor from Uruguay, Paraguay, or Trinidad & Tobago, which have sent applications to ISYA schools in the past. We will inquire with prominent astronomers in these countries about the possible reason for this and take corrective measures.

Although the scope of the school is geared towards MSc/PhD students, we received so many applications from final-year BSc students doing research for their BSc theses (usually taking a year in some of the regional countries), that we decided we had to make room for them

in the school, as they looked as strong MSc candidates for the near future. This was challenging for the lecturers.

All students arrived and departed as scheduled for the school. Local organizers launched a special ground-based operation to bring the Venezuelan students across the Colombia-Venezuela border, given the current difficulties in the country and the unavailability of reasonably-affordable flying options.

The lectures were delivered in a very interactive way and the directors thought the level was well adapted to the younger than usual population of ISYA students. Directors ranked all lecturers as being very good in their material and lecturing style, able to adapt the material to reach at some point throughout their courses all students. By design, all courses started from the very basics, and showed towards the end some new results that are topical in the field. Student satisfaction with being able to follow the classes exceeds the expectations of the difficulties they might had by lecturers.

Most lecturers stayed for 2 weeks or more: full school of 3 weeks, 4 lecturers; 2 weeks, 6 lecturers; 1 week: 5 lecturers. Lecturers staying for only one week were originally asked to stay for at least 2 weeks. In some cases they asked for permission due to other conference/school/observational commitments (2), and in 3 cases it was by design, as the lecturers were giving introductory software material or communication workshops. Although it would have been better to have them all for at least 2 weeks, there was intense interaction between all lecturers and students, especially because the small town set-up encouraged everybody to spend time together, both at classroom, meals and at the hotels.

Miscommunication between IAU Office, lecturers, ISYA directors and host country organizers with travel schedules impacted somewhat the organization of the school. Although asked to copy directors of travel schedules, the travel agency/IAU Office and some lecturers did not forward final travel plans to directors and local organizers, and last minute changes had to be implemented as plans had been made based on their initially communicated plans, affecting both on the local and ISYA budget. We recommend that all travel information is concentrated by one ISYA/OYA part-time secretary that directly deals with lecturers and the travel agency, and that this secretary copies final schedules to local and ISYA directors.

We had three participants (2 lecturers and 1 student) that cancelled their trips in the last minute due to health problems. Tickets issued by the travel agency should be done with cancellation and health/accident insurance, whenever possible.

Lecturers travel schedules are often more complicated than those of students. They arrive and depart at different times and are busy professionals, who usually have to concatenate other work commitments (observing runs, conferences, work visits) with our school. These lecturers are, however, tremendously beneficial to the students, as they can see first hand that their mentors are active researchers in the fields they are lecturing on. At least 4 of our

lecturers were in this situation. The plane tickets were purchased mostly by the IAU Office through the IAU travel agency, but in two cases they asked the lecturers to buy their own tickets due to the complexness of the trips. This was OK to do, but the request to buy their own tickets came in quite late after the initial request to purchase them.

ISYA directors need to have a regular update on the expenses charged to the ISYA account in order to be able to make in-field decisions on an informed basis.

One of the lecturers came with her baby girl and spouse (also an astronomer) to the school. Extra support from the IAU for young mothers as students and lecturers is recommended, and this request was already raised to the General Secretary after the 39th ISYA school in Ethiopia, where we had a student with her nursing baby at the school and a companion to serve as baby-sitter, and several cancellations by candidate students in the same situation.

Two ISYA alumni returned to the school as lecturers (Martínez-Galarza and Muñoz-Cuartas), highlighting the value of ISYAs in the long run. Furthermore, three of the lecturers (Martínez-Galarza, Peña and Rueda) are Colombian citizens working abroad, highlighting the value of academic globalization and the willingness of those not working in their countries of origin to contribute to the development of their scientific communities.

The directors of the school think the 41st ISYA was very successful, meeting the expectations of local and IAU organizers in the progression of Astronomy opportunities for research students in the region.

Appendix A: List of Students

Name	Degree/ Position	Institution	City	Country	Gender
BATALHA DE MELO, Rebeca Maria	PhD student	Observatório Nacional	Rio de Janeiro	Brazil	F
DE SÁ FREITAS, Camila	MSc Student	Valongo Observatory	Niterói	Brazil	F
POSSES NASCIMENTO, Carolina	Ana MSc student	Observatório Nacional	Rio de Janeiro	Brazil	F
LAGOS, Felipe	PhD student	Univ. Valparaíso	Valparaíso	Chile	M
ULLOA, Natalie	MSc student	Univ. Serena	La Coquimbo	Chile	F
ACOSTA, Edgar	PhD candidate	Univ. Industrial Santander	Bucaramanga	Colombia	M
AGUDELO VASQUEZ, Malory	Undergrad stdt	Univ. Antioquia	Medellin	Colombia	F
ALFONSO, Bryan	Undergrad stdt	Universidad Nacional de Colombia	Bogotá	Colombia	M
ARBELÁEZ CARDONA, Daniel	MSc student	Univ. Antioquia	Medellín	Colombia	M
ARBOLEDA, Catalina	Laura MSc student	Univ. Antioquia	Medellin	Colombia	F

BATISTA, Maria		Obs. Coord/ PhD stdt candidate	Universidad de los Andes Univ. Pedagógica y Tecnológica de Colombia	Bogotá	Colombia	F
GARCIA Alejandro	OSPINA,	MSc Student	Colombia	Tunja	Colombia	M
MARTÍNEZ, Alexander		MSc stdt candidate	Univ. Industrial Santander	Bucharamanga	Colombia	M
PARDO MONTAGUTH, Gissel		Undergrad stdt	Univ. Antioquia	Medellín	Colombia	F
PISCO, Jhonattan		Reseacher/PhD stdt candidate	Univ. Industrial Santander	Bucharamanga	Colombia	M
RESTREPO, Paola		MSc stdt candidate	Univ. Antioquia	Medellín	Colombia	F
SALAZAR MANZANO, Luis Eduardo		Undergrad stdt	Univ. Tec. Pereira	Pereira	Colombia	M
TORRES, Andrés		Undergrad stdt	Univ. Industrial Santander	Bucharamanga	Colombia	M
UCHIMA TAMAYO, Juan Pablo		Undergrad stdt	Univ. Tec. Pereira	Cartago, Valle del Cauca	Colombia	M
VANEGAS CARRANZA, Jeisson		Undergrad stdt	National Univ. Colombia	Chia	Colombia	M
VÁSQUEZ, Adriana		MSc student	Univ. Industrial Santander	Bucaramanga	Colombia	F

LLERENA, Mario	Research assistant/MSc stdt candidate	Observatorio Astronómico de Quito	Quito	Ecuador	M
ESCOBAR, Amalia	Undergrad stdt	Univ. Nac. Aut. de Honduras	Tegucigalpa	Honduras	F
GONZALES QUEVEDO, Lisseth	MSc stdt candidate	Univ. Nac. Mayor de San Marcos	Lima	Peru	F
RODRIGUEZ QUIROZ, Alexis Eder	Research assistant/ MSc stdt candidate	Agencia Espacial del Perú	Lima	Peru	M
SANTA CRUZ OLIVO, Raúl Zócimo	Undergrad stdt	Univ. Nac. Ingeniería	Lima	Peru	M
BRICEÑO, Taurimay	MSc student/Sci. Tech.	Centro de Investigaciones De Astronomía	Mérida	Venezuela	F
DÁVILA BRACHO, Eddy Josue	MSc Student	Centro de Investigaciones De Astronomía	Mérida	Venezuela	M
DÍAZ , Margionet	MSc Student	Univ. de Los Andes	Mérida	Venezuela	F
MEJÍA, Alfredo	PhD student	Universidad de Carabobo	Miranda	Venezuela	M
MOYA, Jovanna	Undergrad stdt	Central University of Venezuela	Caracas	Venezuela	F
REYES CARREÑO, Mariangel	Undergrad stdt	Universidad del Zulia	Maracaibo	Venezuela	F

Appendix B: Schedule

Key:

EGdP	Elisabete M. de Gouveia Dal Pino
GB	Gustavo Bruzual
HR & YB	Héctor Rago & Ysabel Briceño
IA	Itziar Aretxaga
JCMC	Juan Carlos Muñoz Cuartas
JF	Jaime Forero
JR	Jorge Rueda
JRMG	Juan Rafael Martínez Galarza
KCL	Kam-Ching Leung
KMD	Karín Menéndez Delmestre
KP	Karla Peña
LN	Luis Núñez
RB	Rodolfo Barbá
OV	Octavio Valenzuela

First Week							
	July 9 Monday	July 10 Tuesday	July 11 Wednesday	July 12 Thursday	July 13 Friday	July 14 Saturday	July 15 Sunday
08:00-9:30	School Opening	EGdP Magneto hydro 2	KMD Observ. Astro 2	GB: Galaxies 2	KP: Stellar Evolution 2		
9:30 - 11:00	KCL Binary stars	JCMC: HP Computing 1	GB: Galaxies 1	EGdP Magneto hydro 4	GB: Galaxies 3		
11:00-11:30	Tea/Coffee Break	Tea/Coffee Break	Tea/Coffee Break	Tea/Coffee Break	Tea/Coffee Break		
11:30-13:00	EGdP Magneto hydro 1	IA: CV Writting	EGdP Magneto hydro 3	JCMC: HP Computing 3	EGdP Magneto hydro 5		
13:00-14:30	Lunch	Lunch	Lunch	Lunch	Lunch	Cultural	Activities
14:30-16:00	JF Astro Soft 1	JF Astro Soft 2	JCMC: HP Computing 2	JF Astro Soft 4	JF Astro Soft 6		
16:00-16:30	Tea/Coffee Break	Tea/Coffee Break	Tea/Coffee Break	Tea/Coffee Break	Tea/Coffee Break		
16:30-18:00	KMD Observ. Astro 1	JF Astro Soft 3	KP: Stellar Evolution 1	JF Astro Soft 5	KMD Observ. Astro 3		
18:00-19:00	Dinner	Dinner	Dinner	Dinner	Dinner		
19:00 - 21:00	HOME WORK	HOME WORK	ic Astronomy Movie and Fc	HOME WORK	Astronomical Obs.	Public Talk	
...							

Second Week							
	July 16 Monday	July 17 Tuesday	July 18 Wednesday	July 19 Thursday	July 20 Friday	July 21 Saturday	July 22 Sunday
08:00-9:30	KP: Stellar Evolution 3	GB: Galaxies 5	OV: Cosmo 1	KP: Stellar Evolution 5	KCL Emission Line Stars 2		
9:30 - 11:00	GB: Galaxies 4	JRMG: AstroStats & XR 2	GB: Galaxies 6	JRMG: AstroStats & XR 4	OV: Cosmo 2	Cosmo 3	
11:00-11:30	Tea/Coffee Break	Tea/Coffee Break	Tea/Coffee Break	Tea/Coffee Break	Tea/Coffee Break	Tea/Coffee Break	
11:30-13:00	IA: AGN 1	KP: Stellar Evolution 4	KMD Observ. Astro 5	JRMG: AstroStats & XR 5	JRMG: AstroStats & XR 6	IA: AGN2	
13:00-14:30	Lunch	Lunch	Lunch	Lunch	Lunch	Cultural	Activities
14:30-16:00	JRMG: AstroStats & XR 1	RB: Virtual Obs. 1	KMD Observ. Astro 6	RB: Virtual Obs. 2	RB: Virtual Obs. 3		
16:00-16:30	Tea/Coffee Break	Tea/Coffee Break	Tea/Coffee Break	Tea/Coffee Break	Tea/Coffee Break		
16:30-18:00	KMD Observ. Astro 4	JCMC: HP Computing 4	JRMG: AstroStats & XR 3	JCMC: HP Computing 5	JCMC: HP Computing 6		
18:00-19:00	Dinner	Dinner	Dinner	Dinner	Dinner		
19:00 - 21:00	HOME WORK	HOME WORK	ic Astronomy Movie and Fc	HOME WORK	HOME WORK	Public Talk	

Third Week					
	July 23 Monday	July 24 Tuesday	July 25 Wednesday	July 26 Thursday	July 27 Friday
08:00-9:30	OV: Cosmo 4	Relativistic A. 2	Business Trip to San Gil	JR: Relativistic A. 3	Student Presentations
9:30 - 11:00	JR: Relativistic A. 1	OV: Cosmo 5		OV: Cosmo 6	Student Presentations
11:00-11:30	Tea/Coffee Break	Tea/Coffee Break		Tea/Coffee Break	Tea/Coffee Break
11:30-13:00	IA: Career Development LN: Astroparticles @ ECol			JR: Relativistic A. 4	Student Presentations
13:00-14:30	Lunch	Lunch	Lunch	Lunch	Lunch
14:30-16:00	HR & YB Sci. Comm. 1	KCL: Job Hunting	RB: Virtual Obs. 4	RB: Virtual Obs. 5	IA: Ethics WS
16:00-16:30	Tea/Coffee Break	Tea/Coffee Break	Tea/Coffee Break	Tea/Coffee Break	Tea/Coffee Break
16:30-18:00	HR & YB Sci. Comm. 2	HR & YB Sci. Comm. 3	JCMC: HP Computing 7	RB: Virtual Obs. 6	School Closing
18:00-19:00	Dinner	Dinner	Dinner	Dinner	Dinner
19:00 - 21:00	HOME WORK	HOME WORK	HOME WORK	HOME WORK	HOME WORK

Appendix C: List of Students' Presentations

GROUP PROJECTS

- The Spatial Correlation of QSOs
- The Color Evolution of Galaxies with Redshift
- Fitting Galaxy Rotation Curves
- Stellar Population Synthesis of Galaxies
- The Particle Mesh Code
- The N-body Problem Solver
- Chemical Evolution of Galaxies
- Detection of Exoplanets via RV curves
- The Stellar Structure Code

INDIVIDUAL PRESENTATIONS

VÁSQUEZ, Adriana	MuTe: Digital Astroparticle Detector for Volcano Tomography			
VANEGAS CARRANZA, Jeisson	Lattice-Boltzman Methodology to Attempt the Simulation of Solar Coronal Loops			
ULLOA, Natalie	A Yellow-Red High-Resolution Spectroscopic Atlas of O-type Standard Stars			
UCHIMA TAMAYO, Juan Pablo	Photometric Methods for Studying Minor Bodies in the Solar System			
SANTA CRUZ OLIVO, Raúl Zócimo	Rapidly Oscillating Ap Stars			
SALAZAR MANZANO, Luis Eduardo	Observations of Stellar Occultation by Minor Bodies in the Solar System			
RODRIGUEZ QUIROZ, Alexis Eder	Potential Zones in Peru for Astronomical Observatories			
REYES CARREÑO, Mariangel	Determination of the Absolute Magnitude of F-type Stars with the Ratios of Equivalent Widths			
RESTREPO, Paola	Intercultural Astronomy, the Case of the Embera Community			
POSSES NASCIMENTO, Ana Carolina	Studying the Star Formation of J0152.7-1357 at z=0.837			
PARDO MONTAGUTH, Gissel	Star Formation in Minor Mergers of Galaxies			
MOYA, Jovanna	Characterization of Gravitational Waves from Physical Parameters			
MEJÍA, Alfredo	Uncertainties in the Spectral Synthesis of Galaxies			
MARTÍNEZ, Alexander	Data Repositories			
LLERENA, Mario	Diffuse HII Regions Around the Galactic Center			
LAGOS, Felipe	Triple Dynamics in the Context of Supernova Ia Progenitors			
GONZALES QUEVEDO, Lisseth	A Study of the Cold Material around Vega			
GARCIA OSPINA, Alejandro	Statistical Model for the Calculation of the Solar Rotation Origin			
ESCOBAR, Amalia	Dwarf Galaxy Mass Determinations with Strongren Photometry			
DÍAZ, Margionet	Effective Models, QCD Phase Transitions and Astrophysical Applications: Neutron Stars".			
DE SÁ FREITAS, Camila	Star Formation Acceleration for the Local Universe			
DÁVILA BRACHO, Eddy Josue	Searching for Wide Binaries in the Southern Hemisphere Using SPM4			
BRICEÑO, Taurimay	Level and Evolution of Light Pollution in the Observatorio Astronómico Nacional Mérida- Venezuela			
BATISTA, Maria	Design of a Prime Focus Corrector for a f/5 Spherical Telescope			
BATALHA DE MELO, Rebeca Maria	Constrains on Supernova Models Using Galaxy Clusters			
ARBOLEDA, Laura Catalina	Modelling Stellar Feedback in Gas-rich Galaxies			
ARBELÁEZ CARDONA, Daniel	Sky quality in the San Nicolas Valley for Astronomical Observations			
ALFONSO, Bryan	Automatic Detection of Light-Bridges on a Sunspot			
AGUDELO VASQUEZ, Malory	Resolving the Unresolved: Inferring the Geometry of the Central Material in AGN			
ACOSTA, Edgar	Orbits for the MacMillan Problem with a Test Particle of Variable Mass			
TORRES, Andrés	The Chemistry of He-Burning Stars			

Appendix D: Students Feedback by Numbers

This is a direct transcription of the feedback forms filled by the students. 30/32 students filled the form. Some of them identified themselves. Disclosing their identity in the feedback form was optional.

Any significant correction or addition to their texts is indicated by []

General

		5	4	3	2	1	
The website told me all I needed to know to prepare for the school	Strongly agree	9	12	5	2		Disagree
The application form was easy to fill in	Strongly agree	23	6				Disagree
Applications were efficiently handled	Strongly agree	21	6	1			Disagree

1. Comments:

- 1.1 There were some informations about logistics that was not very clear to me (accommodation, meals, etc) until the week of the event.
- 1.2 Some information was available only a few days before the school
- 1.3 I know people that were not selected that complained about the lack of feedback about the application
- 1.4 They spent too much time making the selection, although I understand the reason.
- 1.5 I didn't get enough information of the procedure after enrolment

Lectures

		5	4	3	2	1	
The lectures were the most useful part of the ISYA	Strongly agree	21	7	1			Disagree
The time spent on the lectures was too long	Strongly agree	5	7	10	7	1	Disagree
The lectures were at too high a level	Strongly agree	5	8	9	7		Disagree
I could follow most of the lectures well	Strongly agree	9	16	5			Disagree
The lectures were well presented	Strongly agree	16	12	2			Disagree
The lecturers responded well to questions	Strongly agree	22	8				Disagree
I found it easy to get on with the lecturers	Strongly agree	18	8	3			Disagree
The lecture room was comfortable	Strongly agree	19	9	1	1		Disagree
I think there was a good balance of hands-on and practical lectures	Strongly agree	15	11	3	1		Disagree
I found the Career Development, Job hunting, CV writing... workshops useful	Strongly agree	27	3				Disagree

2. Comments:

- 2.1 Even if I understand that it was needed to reorganize the lectures because of the professors that couldn't come, I was really disagreeing with [having] the Spanish lectures [note: a Spanish speaker]
- 2.2 The teachers really easy to get along with and very open to collaborate, which I particularly found very nice.
- 2.3 I very much appreciate that we dedicated time to discuss and share experiences about job hunting, CV writing and career development
- 2.4 We need more time for the practical lectures like python and astrostatistics
- 2.5 About the level of the lectures, most of the lectures did not have a level much higher than my background. But some of them were incredible and I learned SO MUCH. Such as: MHD (Elisabete Gouveia), Relativistic Astrophysics (Jorge Rueda), HPC (Juan Carlos Muñoz), X-rays (Juan Rafael), Science Communication (Ysabel & Héctor), AGN (Itziar Aretxaga), Emission-line stars (Kam-Ching) [note: MSc student]
- 2.6 I liked a lot the CD, JH & CV classes because it will be VERY USEFUL in my future.
- 2.7 Some classes I had in my undergraduate course, so it did not help me a lot . [note: MSc student]
- 2.8 The time in the lectures was OK. The level of the lectures was challenging, but I think that was due to my background in astronomy, because at my university we don't have formal classes on astronomy. But in general I could follow the most general concepts. [note: BSc student]
- 2.9 *Agradezco mucho las lectures sobre CV, Job Hunting y Career Development. Es algo que nunca había visto en una escuela y pienso que es muy importante que los profesores nos orienten en el ámbito laboral en el que tenemos que desempeñarnos*
- 2.10 [regarding q.8] The light and space doesn't fit with this kind of lectures
- 2.11 The lectures were at a low level most of the time, but it is always good anyway to emphasize the basic content. Another comment would be that some lecturers were passing too fast about some contents. Maybe we could have more time to get rest. All these frequency of lectures were becoming difficult to follow because we were tired. The lectures were the most useful, but the interactions were also important. One suggestion is that you could do an integration [activity] at the beginning, like at the end of the first day.
- 2.12 With respect to the time spent [in lectures] it was not too long. It was the correct time to cover all the information for each topic [note: the student marked that question with 1]
- 2.13 I am very grateful for accepting me in the ISYA school. I have found the necessary guidance to start my masters project. I am very happy to have had the opportunity to meet experts in topics of Astrophysics and Cosmology.

Observations and Project training

		5	4	3	2	1	
The group project was challenging but I learned about the topic and about working in a group environment	Strongly agree	22	6		2		Disagree
The time spent on projects was right	Strongly agree	12	7	7	3	1	Disagree
The lectures prepared me adequately for the project	Strongly agree	17	9	2	1		Disagree
The computing facilities were good	Strongly agree	17	7	2	1		Disagree
The tutoring I got for my project was adequate	Strongly agree	22	7				Disagree
I found the project supervisor helpful and easy to get on with	Strongly agree	26	2	1			Disagree
The observing night of Friday 13 th was a good training for me	Strongly agree	16	6	7			Disagree
It would have liked to have more observing training	Strongly agree	15	8	2	3	1	Disagree

3. Comments:

- 3.1 I think that was awesome, even with the pressure and the slow equipment, jeje
- 3.2 The level of my group was not well balanced, so much of the time I had to be explaining the project step-by-step. I understand that this was one of the goals, but I did not learn much from my group (almost nothing) [note: same MSc student as in 2.3]
- 3.3 It is always good to observe ☺ Never is enough
- 3.4 [regarding q.8] I wanted to have more time to dedicate to the exercises of computing. Since we could have time to rest, because it is really difficult.
- 3.5 In the schedule there was no time to work on projects, just for lectures, so with the time after dinner it wasn't enough to fulfil the challenges proposed by the projects.
- 3.6 I think more time for the projects was needed. The observing night was a great experience that I haven't had before ISYA.
- 3.7 We need some more time for projects
- 3.8 We need more time because the lectures are very strong

Presentation exercise

		5	4	3	2	1	
The student presentations were a good exercise	Strongly agree	27	3				Disagree
The time spent on this activity was right	Strongly agree	20	5	2	3		Disagree
This exercise was well organized	Strongly agree	25	3	2			Disagree
I learned how to do presentations	Strongly agree	21	7		1		Disagree

4. Comments:

- 4.1 I really learned that teamwork can be difficult but not impossible. I really loved the exercise of individual presentations. I shall follow the work to improve the time to get down to “1 minute time” for an individual presentation.
- 4.2 Itziar organized this part very well. I am impressed...
- 4.3 We need more time
- 4.4 Maybe we could know about the presentations when we were selected because I had to ask if we had to make a poster or slide before going.
- 4.5 Again, there was no time in the schedule for working in the students’ presentations. The free time after classes is very short and sometimes it was not completely free because of the outreach activities and the public talks. [same student as 3.5]
- 4.6 I liked the exercise of the 2-minute presentation

Accommodation:

		5	4	3	2	1	
Transportation from my town was efficiently done	Strongly agree	18	6	4			Disagree
The rooms were good	Strongly agree	14	11	1	1		Disagree
The breakfast was good	Strongly agree	10	7	9	3	1	Disagree
The meals were good	Strongly agree	12	5	10	1	1	Disagree
The organizational support was good	Strongly agree	21	6	3			Disagree
Generally, the ISYA environment was good	Strongly agree	23	7				Disagree
UIS/Socorro was a good place to hold this ISYA	Strongly agree	23	5	2			Disagree

5. Comments:

- 5.1 For the hotel we needed a better power for the internet. That was one of the reasons why we (I mostly) prefer to stay at the University, because in the hotel became impossible to develop some homework and projects with[out] a good WIFI signal.
- 5.2 Too crazy the weather!
- 5.3 The food was a little bit out of balance, specially the breakfast.
- 5.4 [Regarding q.4: The meals were] repetitive and not culture representative for our international guests
- 5.5 The quality of the food was bad, and there were times when the food was not enough
- 5.6 The travel Venezuela-Colombia was tiring and complicated [note: the student marked 4 q.1]

Cultural tours and Leisure time:

		5	4	3	2	1	
There was enough leisure time in this school	Strongly agree	6	9	6	3	3	Disagree
The Saturday 14th Socorro tour and public lecture were good	Strongly agree	15	7	4	2		Disagree
The Wednesday Film Forum was good	Strongly agree	11	10	6	3		Disagree
The Sunday 15th excursion to Barichara and Guane was good	Strongly agree	21	5	2			Disagree
The Friday 20 th concert was good	Strongly agree	14	11	3	1		Disagree
The Saturday 21 st public lecture was good	Strongly agree	18	6	4	2		Disagree
Having a free day on Sunday 22nd was good	Strongly agree	26	3				Disagree
Sport facilities were good	Strongly agree	11	5	4	3	1	Disagree
Generally, this part of the ISYA was good	Strongly agree	21	5	4			Disagree

6. Comments:

6.1 I think that a guide that speaks English was really necessary [note: Spanish speaker, same as in 2.1]

6.2 [regarding questions 2,3,6] I think you should include the students in the development of the outreach activities, in order to encourage the exercise of outreach in astronomy and other topics in science.

6.3 [reg. questions 3,6] The Wednesday film was in Spanish, and the same for the public lectures. I understand why it had to be in Spanish, but I couldn't understand. [note: a Brazilian student]

6.4 [regarding q.1,2]: I like the lectures, but It was hard work. Not enough information about Socorro and not good welcoming.

6.5 Didn't know there were sporting facilities [note: they were in plain view during coffee breaks and in the lunch area]

6.6 [regarding q.7] The leisure time was mostly for projects and personal presentations and also for public lectures and outreach activities. The concert was good... but again, not enough time for projects [same student as in 3.5, 4.5]

6.7 [regarding q.4] I didn't go to excursion [note: a Venezuelan student]

The future

		5	4	3	2	1	
I developed an international network as a result of this ISYA	Strongly agree	23	6				Disagree
The ISYA helped me to better understand my actual research interests	Strongly agree	19	9		1		Disagree
The ISYA encouraged me to strengthen my research in astronomy	Strongly agree	25	4				Disagree
Through the ISYA I acquired a broader view on the research done in astronomy	Strongly agree	23	5	1			Disagree
I have benefited significantly from attending this ISYA	Strongly agree	26	2	1			Disagree

7. Comments:

- 7.1 [Regarding q.4] MHD (Elisabete) classes was new information and I really appreciate.
- 7.2 Thanks for all! I really learned a lot about astronomy. I met many good classmates and teachers. I won't forget the moments I had here.
- 7.3 I found it really useful for my future research to share ideas with teachers and other students [note: same student that marks ISYA has not helped him/her to better understand his/her research interests]
- 7.4 ISYA was a great experience that helped me to understand what topics I would like to research in my future studies (i.e, Master and PhD)
- 7.5 Thank you for the help

If you have any other comments, please put them here:

- 8.1 Suggestion: I know one of the goals is to train in English, but it may be useful to have minimum requirement because some people just didn't absorb anything (because of the language) and another person could have taken more from ISYA.
- 8.2 This was an incredible opportunity and experience. Thanks Itziar, Kam & Luis.
- 8.3 Thank you so much for this opportunity! Itziar, Kam and Luis, you are brilliant and inspiring people. I will take this moment forever in my mind. Thank you for everything.
- 8.4 Thanks so much for Itziar, Kam, Juan Carlos and Luis for the effort. Was very great.
- 8.5 Thanks, thanks, thanks, thanks a lot!!! I would like to suggest to give more time for homework from the different lectures. I really appreciate all the ISYA effort. See you soon!!!
- 8.6 Even if medicated for two weeks and ending in the hospital, I enjoyed it and learned a lot.
- 8.7 Thank you. I learned a lot.
- 8.8 I would like to suggest to update the website as soon as you can, it will avoid asking questions about simple things.
- 8.9 Thanks you for this unique opportunity
- 8.10 In general the ISYA school was very complete and full with new knowledge. I have learned new areas of research and it was possible to improve the way of my master thesis.
- 8.11 Thank you for giving me the opportunity of studying at this school.

Appendix E: Lecturers' Feedback by Numbers

This is a direct transcription of the feedback forms filled by the lecturers. 10/12 lecturers (we excluded school directors) filled the form

A) ORGANIZATION BEFORE THE SCHOOL

		5	4	3	2	1	
The website/emails told me all I needed to know on how to prepare my lecture course	Strongly agree	6	4				Disagree
The website/emails told me all I needed to know to go and come back from the school	Strongly agree	5	3	1	1		Disagree
Communication with ISYA program directors was efficient and they replied to my queries timely	Strongly agree	8	2				Disagree
The planning of my trip to/from the school was easily done through the IAU Office	Strongly agree	3	4			2	Disagree

[note: 3 of the 3 lectures that marked 5 in q.4 were local lecturers, whose travel was not arranged by the IAU Office, but reimbursed locally]

Comments:

- The local arrangements were announced only a few days before the start of the school. It would have been helpful to know in advance the details regarding transportation between Bucaramanga and Socorro.

B) LECTURES/STUDENTS AT THE SCHOOL

		5	4	3	2	1	
The school infrastructure was appropriate for me to lecture efficiently	Strongly agree	10					Disagree
The lecturing time I requested was awarded by the school	Strongly agree	10					Disagree
I found the students could follow my lectures at a reasonable pace	Strongly agree	5	5				Disagree
The background of the students was too diverse for the lectures to reach them all at some level	Strongly agree	1	3	3	2	1	Disagree
On hindsight, I would have needed more time / another arrangement to lecture my topic efficiently	Strongly agree		1	3	5	1	Disagree
I believe my lecture course helped the students in advancing their graduate studies and will make them stronger candidates for any other graduate school they apply to.	Strongly agree	5	3	2			Disagree
I believe my course was well related to the rest of the courses at the school.	Strongly agree	4	4	2			Disagree
Generally, the ISYA environment was good and productive.	Strongly agree	9	1				Disagree
I am willing to maintain contact and mentor some of the students I met at the school	Strongly agree	9	1				Disagree

I believe my time and effort was worth it, and I promoted the education of the students attending.	Strongly agree	9	1				Disagree

Comments:

- I found a group of extremely interested students and in addition they had very good level and background in physics. I am really happy of having participated as a lecturer of such a nice group of students. I enjoyed very much answering their very interesting questions both in the room and at coffee breaks!
- I feel that the level of my lectures was enough. I'm happy with the results I got from the lectures in the sense that I got the students to know some important issues related to the development of computational tools for astronomy (in general, scientific computing) and next generation astronomy. My goal was to present the scenario, to let them know that these things exist, and how can they be used in their research. Proper teaching of these subjects may need more time for the students to learn some complex concepts involved from the practice. I'm personally happy with the results. My personal goals were fulfilled!
- I know time is precious, but, Don't you feel we loaded the students with much work? Students worked 100% on the topics of the school, and that is very important (the school is intensive).
- I really enjoyed the school. The main drawback was actually on my side, because I could not stay longer than 1 week. I recommend to have an astrostatistics course in every school from now on, as topics such as machine learning are becoming a fundamental tool for astronomers.
- I think that the communication of science is a subject that should continue to be included in this sort of school, since it offers future astronomers to broader and interdisciplinary profile. I was very satisfied with the response and commitment of a large part of the students.
- I was impressed by the students' commitment and dedication — the school organizers certainly did a good job not only selecting good students, but also immediately conveying to the students since day 1 that the school was going to be demanding and that they were there after a careful selection of candidates... commitment and dedication were necessary!

C) INFRASTRUCTURE

		5	4	3	2	1	
The transportation from airport to school was efficiently done	Strongly agree	6	2		1		Disagree
The hotel rooms were good	Strongly agree	5	2	2			Disagree
The meals were good	Strongly agree	4	2	2	2		Disagree
The local organizational support was good	Strongly agree	10					Disagree
UIS was a good location to carry out the ISYA	Strongly agree	9	1				Disagree
The selected city was a good location for the school	Strongly agree	9		1			Disagree

Comments:

- In general I'm very happy with the local organization of the school. In general everything was just there for us to develop the school.
- Not having access to warm water was a challenge. I was traveling with my family and, although we were not expecting 5/4-star hotels, it was a big surprise to realize that we were going to have to




deal with 10 days with cold showers — especially tough with a toddler! I would have appreciated some advance warning!

- Carry out this type of activities in small towns, is an added value. I liked the activities with the local people.

General Comments:

- I really appreciate that the organization accommodated great vegetarian meals for me. Besides that, the UIS location in the small and historical town of Socorro was helpful to make tighter bonds between everyone involved in the school (students, lecturers and technical support). The local infrastructure and support was also wonderful. I was lecturing on basic programming with Python and I had great support before and during the school to provide a good learning experience to the students.
- It has been a pleasure (and a honor!) to take part of this school. Feel free to count with my help for other schools, either as lecturer, doing academic support, or so!
- Thank you so much for giving me the opportunity to be an instructor at ISYA2018. For me was such a great experience, I had the chance to face a teaching challenge and at the same time to make coaching to the students
- It was a pleasure to participate in such a worthy effort to spread high-quality professional astronomy education to advanced undergrads and grad students. I would be happy to participate again in the future!
- I think it would be valuable for the students to have some free time (besides coffee break or eating time) to talk to the professors about specific topics. The professors could have like Office Hours (may be one or 2 hours during the week) during which they could talk and orient the interested students.

Appendix X: A Poem Written by Alexis Rodríguez Quiroz during the 41st ISYA and Read at the Closing Ceremony

   CANC. GUARDAR

Introducir título

No sientes la lluvia cuando tu corazón está armado con un paraguas. No sientes frío cuando te acompaña el calor de tus amigos. No sientes apuro de llegar a casa cuando la felicidad anda en ti sin prisa. No sientes que el camino es largo cuando tus sueños están a la vuelta de la esquina.

Que más da mojarse un poco o intentar cruzar al otro lado con cuidado, cuando existen más barreras como el idioma o el dinero, pero recordando siempre que nada es infranqueable. Pues así es la vida, como la naturaleza de sorpresiva.

Y están los astrónomos, que duermen poco, pero tienen más sueños en la vida que cualquiera que mira al suelo.

Kam-Ching Leung

Univ. Nebraska, USA

ISYA Program Director

Itziar Aretxaga

INAOE, Mexico

ISYA Deputy Director