

**Report on the COSPAR Capacity Building Workshop  
"Planetary Sciences Data Analysis "  
Antofagasta, Chile - 16-27 January 2023**

**Carlos Gabriel - COSPAR**

## **I – Introduction**

The workshop took place at the Universidad Católica del Norte (UCN) in Antofagasta, the core of the Atacama Desert, from 16 to 27 January 2023. Organised mainly by COSPAR together with UCN, the University of Chile (Santiago de Chile) and the Uruguayan University of the Republic, it was supported by international organisations, such as the space agencies NASA and ESA and the European Southern Observatory (ESO). It was also sponsored by local organisations such as the Meteorological Society, the Centre for Astrophysics and Related Technologies (CATA), the Millennium Institute of Astrophysics and the Geological Society of Chile. The company L3Harris contributed by offering free IDL licenses for the students for 6 weeks.

The workshop was proposed and organised locally by Prof. Millarca Valenzuela from UCN, Prof. Gonzalo Tancred from the Universidad República del Uruguay who scientifically directed it, and Prof. Patricio Rojo (Universidad de Chile).

The aim of the workshop was to develop interesting scientific projects guided by experts from missions such as Hayabusa 2, Mars Express, JUNO, New Horizons and DART. This involved learning various analysis tools such as Spice, Small Body mapping Tool and programmes dedicated to the specific analysis of data from the different missions. Representatives from Nasa's Planetary Data System, Jaxa's Science Data Archive and ESA's Planetary Science Archive assisted in the extraction and management of data from the various databases.

Details of the workshop can be found on the Capacity Building Programme pages (<http://cosparhq.cnes.fr/Meetings/Workshops.htm>) and on the local website (<http://cospar.das.uchile.cl/>).

## **II – Participants**

A total of 37 candidates were selected out of a total of 101 candidates. The selected students were all, with one exception, from Latin American countries (11 from Chile, 9 from Brazil, 6 from Argentina, 3 from Uruguay, 3 from Mexico and 1 each from Bolivia, Colombia, Ecuador, Peru and Japan). These workshops are defined as regional, for several reasons, including financial ones. A good candidate from a different region has to bear the costs of his or her participation. A couple of the originally chosen students have withdrawn their participation a few weeks before the event, but could easily be replaced by other candidates. The limitation to 37 students was mainly due to financial reasons, the somewhat low local funding together with inflation especially related to flight costs forced us to be very conservative from the beginning.

The geographical distribution of the students showed a strong regional diversification. The gender distribution showed a 57/43% female/male student ratio, which is quite typical considering the workshops previously organised in this region. The full list of students, with their affiliation and nationality, can be found in Appendix I.



**Fig. 1: Participants and Lecturers of the COSPAR CB WS - First week**



**Fig. 2: Participants and Lecturers of the COSPAR CB WS - Last Day**

### **III – Lecturers**

For most of the speakers/supervisors this was their first participation in a COSPAR CB workshop, most of them were sent by the space missions we have consulted. Juno, a NASA space probe orbiting Jupiter, sent 4 mission specialists: Scott Bolton, Jack Connerney, Steven Levin and Frederic Allegrini; New Horizons, NASA's mission to the Pluto system and beyond sent Simon Porter, a postdoctoral researcher. Another postdoctoral researcher, Terik Dalik, represented the DART mission, Double Asteroid Redirection Test, a planetary defence mission that successfully collided in September 2022 with the small asteroid Dimorphos, changing its orbit. Another specialist on small solar system bodies, James "Gerbs" Bauer, spoke mainly on the PSA and PDS planetary data science systems. JAXA's Hayabusa 1 and 2 missions were represented by Sergi Sugita. Lucie Riu, ESA research fellow, was the Mars Express specialist and a very active project supervisor. The team of supervisors was completed by Javier Suarez from Jacobs University Bremen (Germany), another Mars Express specialist. All of them participated for the first time in a COSPAR CB workshop. However, the scientific leadership was in the hands of a Uruguayan professor with COSPAR CB experience who had led previous Planetary Science workshops in Montevideo, Uruguay, in 2007 and Guaratinguetá, Brazil, in 2015. Several presentations on future planetary missions from both ESA and NASA were made online (a first for COSPAR CB).

The full list is given in Appendix II.

### **IV – Program**

From the programme (Fig. 3) it can be seen that the school was structured with approximately 43% of the time devoted to science lessons, 13% to lessons on data analysis software and 43% to the projects that the students had to carry out (a bit misleading because the students usually work long hours, especially in the second week). As in the past, most of the teachers also acted as project supervisors.

For the first time all the presentations could be followed online via Zoom, and we also used it to record them. Together with all the material used, the files of the presentations, including those made by the students at the end of the workshop, are available [this Google drive](#).

### **V - The projects**

The students defined their projects together with the supervisors, and decided at that point to work individually or in small groups. A division was made to assign supervisors according to the chosen topics. The number of supervisors was perhaps too short on this occasion, with only 4 supervisors present in the second week (L. Riu, T. Daly, S. Porter and J. Suárez), although on-line help was also available.

Unlike all astronomy workshops held in the last 10 years, in which practically all students worked on their projects using their own laptops, in this case we had few students, six in total (17%) using the desktop computers provided. The desktops we had at our disposal (40, a very large number) were equipped with Windows as their operating system. Although it was possible to install most of the software to be used on them, this took some time and some students were not used to using Windows.

COSPAR CAPACITY BUILDING WORKSHOP ON PLANETARY SCIENCES DATA ANALYSIS								
Antofagasta, Chile, January 2023								
Day , Date								
Arrival & Registration - Sunday 15/1								
		9:00 - 10:30		11:00 - 12:30		14:30 - 16:00		16:30 - 18:00
Mon	16-Jan	Opening Ceremony / Planetary Exploration - G. Tancredi	Coffee Break	Orbital Dynamics A. Bertachini (virtual)	Lunch Break	PDS G. Bauer	Coffee Break	Small Body Mapping Tool T. Daly
Tue	17-Jan	PSA / PDS M.Bentley (virtual) / G. Bauer		SPICE T.L. Farnham (virtual)		JUNO S. Bolton / J. Connerney		JUNO F. Allegrini / S. Levin
Wed	18-Jan	Hayabusa 1 & 2 S. Sugita		Hayabusa 2 S. Sugita		Mars Express L. Riu		Mars Express J. Suárez / A. Pio Rossi
Thu	19-Jan	Work in Projects		Work in Projects		Work in Projects		Work in Projects
Fri	20-Jan	Work in Projects		Work in Projects		Work in Projects		COSPAR CB Initiative C. Gabriel CBW in Planetary Sciences G. Tancredi
Sat	21-Jan	Saturday: Excursion to Paranal, meteorites survey in the desert, visit to "Mano del Desierto", Star Party						
Sun	22-Jan	FREE						
Mon	23-Jan	DART T. Daly	Coffee Break	DART G. Tancredi	Lunch Break	New Horizons - Mission Overview S. Porter	Coffee Break	New Horizons - Lorri images S. Porter
Tue	24-Jan	Mars Science-Geologic methods and Projects J. Suárez		Docker ISIS3 for Planetary Data J. Suárez		Work in Projects		Work in Projects
Wed	25-Jan	Future ESA missions M. Küppers, I. Belgacem, J. Wright		IDEA: (Inclusion, Diversity, Equity, and Accessibility) IDEA Task Group		Future NASA missions K. Crombie, H. Levison		Work in Projects
Thu	26-Jan	Basics of Scientific Presentations C. Gabriel Work in Projects		Work in Projects		Work in Projects		Work in Projects
Fri	27-Jan	Work in Projects		Work in Projects		Presentations by Students - Diplomas + Closing ceremony		



**Fig. 3 - The program**

## VI - The inclusion of IDEA

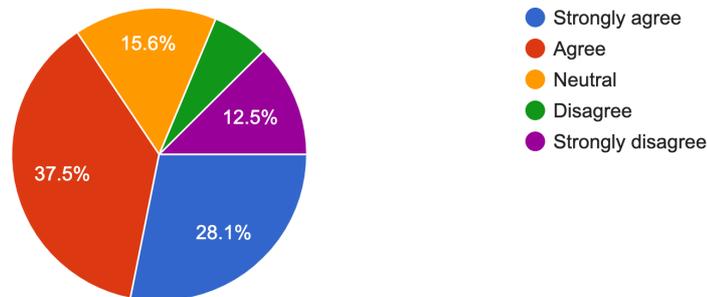
This workshop presented novelties not only with respect to the introduction of online classes (in the post-COVID19 era this is truly accessible) but also introduced a segment dedicated to discussion on inclusion, diversity, equity and accessibility (IDEA), in line with COSPAR's decision to incorporate in its strategic plan a call to action to define a roadmap to achieve this across the organisation.

An obvious communication problem between the local organisers, scientists and the IDEA team led to a lack of clarity on whether the 90 minutes should be a round table including students, or a panel discussion, or something in between. The result was interesting presentations by the four women on the panel and only at the end were students invited to comment. This format was totally outside the expectations of the

students, who evidently, according to the comments obtained in the final evaluation, considered IDEA in general as a very valuable element, but expected a discussion on the problems they face in their respective countries, both professionally and socially, and not what was done.

The inclusion of a "round table" on Inclusiveness, Diversity, Equity and Accessibility (IDEA) was a good idea.

32 responses



**Fig. 4 - Inclusion of IDEA**

The experience, although negative in important aspects, can tell us a lot about what to change and improve for future events. We hope to include aspects of IDEA in all training workshops we organise.

## VII- Results

At the end of the workshop, each student or group of students gave a short presentation (10 minutes + 3 minutes discussion for individual presentations, 12 minutes for groups of two, 15 minutes for groups of three) summarising the results obtained. In general, the students respected the predefined times, although the discussion time had to be extended in several cases, due to the interest shown by the audience of all students, teachers and assistants. For many of the students it was the first time they had given a presentation in English. The list of presentations is given in Appendix III. The results have generally been very good, demonstrating that all participants understand the field work methodologies and most of them are in principle able to work with data and tools from at least one of the missions involved, in some cases more than one, after returning to their home institutes.

## VIII - Venue

The workshop took place in Antofagasta, Chile, in the heart of the Atacama Desert, in rooms provided by the University. A large classroom with a capacity of 80 people was used for presentations, and a large laboratory with 50 desktop computers for data analysis (see figures 5 and 6).

The network bandwidth at both locations was quite good, sufficient for all participants to download programmes and data at peak times. This was necessary, as the internet at the hotel where we were staying was very poor.

There were no additional rooms for small groups, nor a speaker's area that we could use when we were not lecturing, supervising or attending other people's lectures, but we could use a corner of the building for group discussions, without affecting the other participants. The internet connection was so good that there was no need to set up a local network for data distribution.



**Fig. 5 – The lectures venue**



**Fig. 6 – The data lab**

### **IX – Lunch and Coffee Breaks**

They were held in an open area adjacent to the laboratory or in the foyer of the classroom used, depending on where we were working. The quality was excellent. This was provided by a catering company, the same one that prepared the fabulous catering for

the star party (see below). Coffee breaks consisted of biscuits, some pastries, fruit, sandwiches and coffee and tea, and were served twice a day.

Lunch was organised in the university canteen, which was little used by locals during the weeks we were there because the university was on holiday. We found the quality of the canteen to be very good. Vegetarian and vegan meals were included..

### **X - The Hotel**

The hotel Alto del Sol - Costanera Antofagasta turned out to be a very good option to accommodate all the students and teachers. Located in front of the sea, 500 m from the UCN and 800 m from the restaurant, it offered single rooms for the teachers and double rooms for the students. The board included a good breakfast, which offered students and teachers the first daily opportunity to socialise.

### **XI - The Mitad del Mundo restaurant**

We dined at this place. The meals were acceptable, except for some problems in understanding vegetarian and vegan needs. Overall, the service was good, and so were the meals, always including a vegetarian alternative and a vegan variation. Many nights there was a nice terrace for our exclusive use, so we dined there, which was a very good alternative to a slightly too noisy room.



**Fig. 7 - Dinner time**

### **XII - The excursion**

The excursion took place on Saturday and was undoubtedly one of the highlights of the stay. We went to visit ESO's Paranal site with the impressive Very Large Telescopes

(VLT), about 130 kms from Antofagasta. A large bus and a minivan took us all to combine this visit with a field trip to learn how to search for meteorites in the desert.



**Fig. 8 – Searching for meteorites**

In the total area we scanned for meteorites we would expect an average of 1.5 meteorites. One candidate was found, which has been left at UCN for analysis.



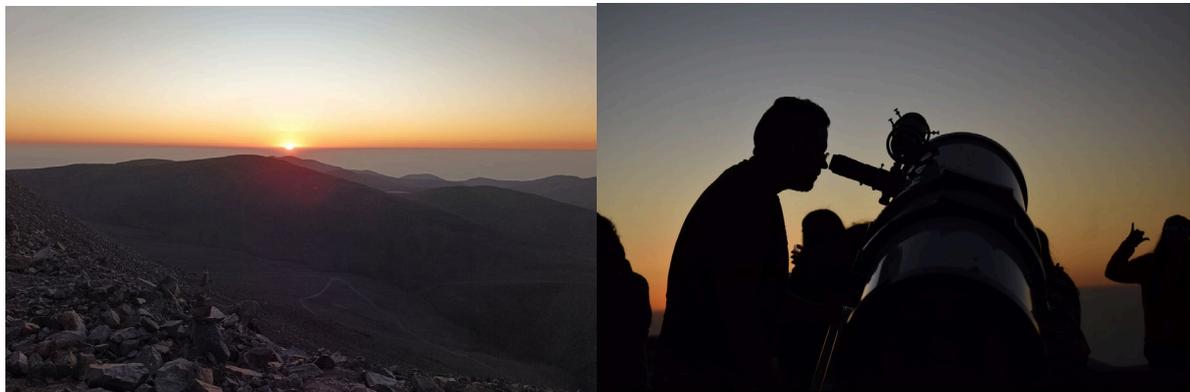
**Fig. 9 – ESO-Paranal entrance and the VLT-1 telescope**



**Fig. 10 – A view of the 4 telescopes and some visitor**

After these visits we headed to the Mano del Desierto, halfway back to the city of Antofagasta, a much visited monument (to experience a combination of art and strong desert wind!) to finally reach a plain at an altitude of 1700 m near El Cobre, which is a formidable platform for observing perhaps the best sky on Earth.

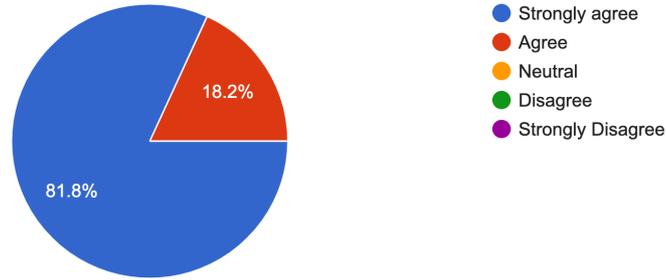
There were several telescopes with solar filters brought by UCN staff for pre-sunset observations. As night fell and, in the darkness, we enjoyed an exceptional seafood catering complemented by pisco sour and good Chilean wines. Fruit juices were also available for the more timid. We enjoyed a sensational night, under a sky with a new moon (they had also prepared it, evidently) in which we observed planets, constellations, a milky way that seemed to fall on us, we clearly saw clusters of stars and the Magellanic clouds.



**Fig. 11 – A magnificent sunset – telescopes from UCN**

We were back at the hotel at 23:30 with the impression that it had been a truly unforgettable experience. The level of satisfaction with the excursion was very high, as the evaluation results show. The selection of activities was excellent, with a healthy mix of science and fun.

The excursion in the week-end was good  
33 responses



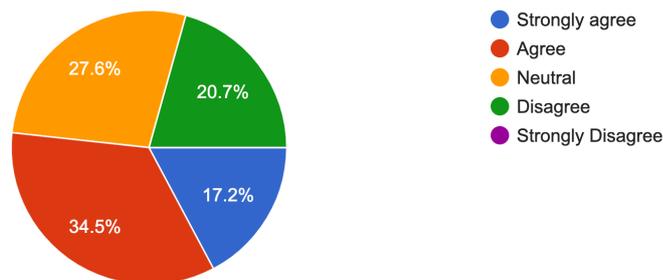
**Fig. 12 – Evaluation of the excursion in the week-end**

### **XIII - General evaluation**

As anticipated in several points, we have prepared and distributed among the students an evaluation sheet (Ap. IV), in order to obtain feedback on the different aspects of the workshop, obtaining so far 33 evaluation sheets answered (> 80 %). A first analysis of the results has been carried out. In general terms, the results do not differ much from those obtained in previous workshops in Latin America. As always, with regard to local elements (place, food) opinions differ partly, as is to be expected due to the very different conditions.

A notable difference from previous evaluations is the level of satisfaction with financial support, which is much lower than in the past. The general increase in workshop-related costs, especially flight costs, has forced us to reduce the percentage of subsidised travel expenses. In the past, this percentage ranged from 70% to 80% of the price of an economy ticket. This time we have been forced to reduce it to an average of 55%. This, together with the rising cost of flights in general, and the economic situation in a large number of Latin American countries with very weak currencies, has led to a low level of student satisfaction (and also to an increase in students' efforts to cover these costs themselves. It should be clarified, however, that we did not have any refusal of the invitation to participate for financial reasons).

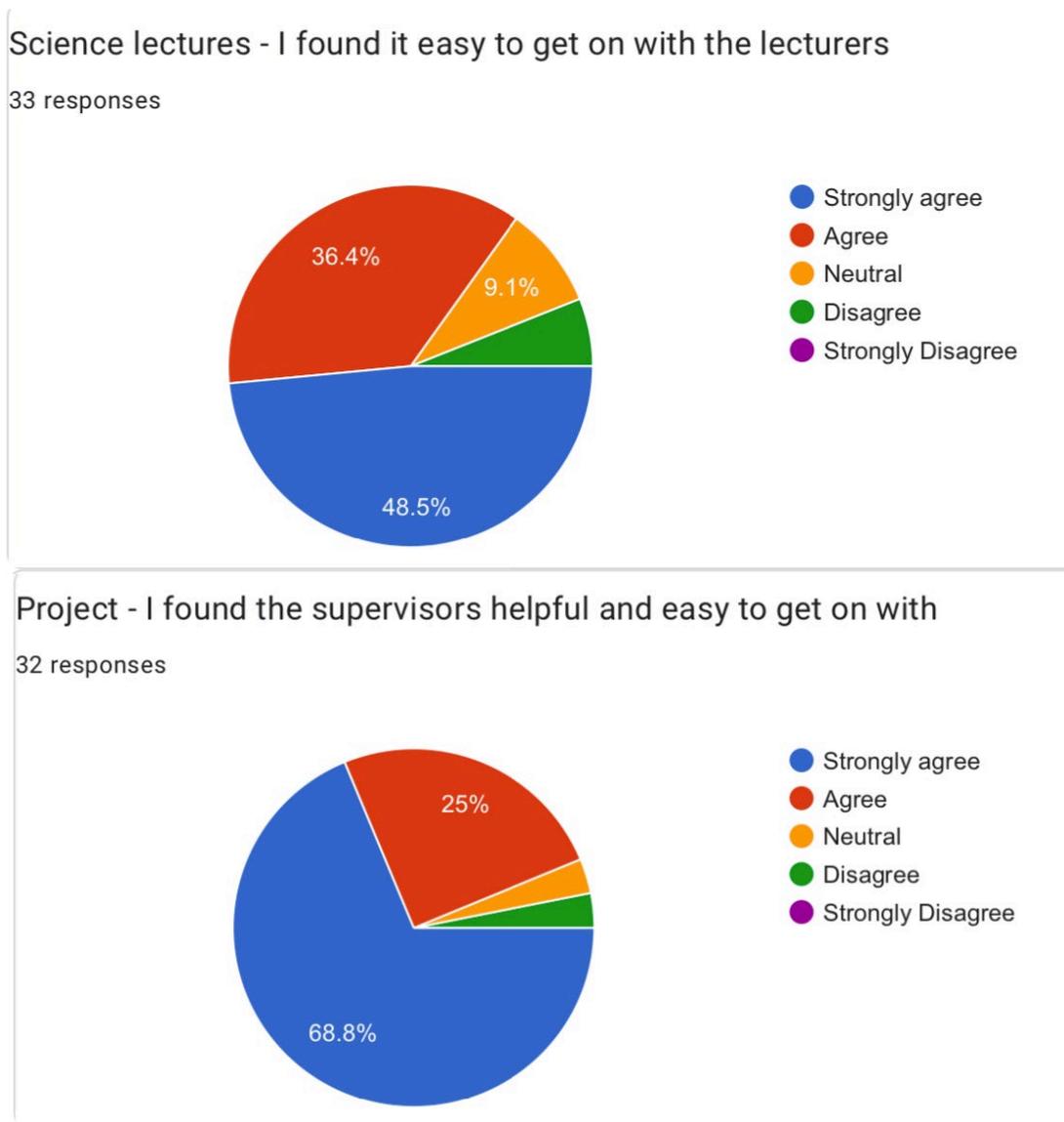
General - The financial support I got was sufficient  
29 responses



**Fig. 13- Evaluation of the financial support (travel subsidy)**

There is a high level of satisfaction with the workshop in general, also with the teachers and supervisors. The hard work done by the latter in helping with data reduction and analysis is especially rewarded with more than 90% agreement (of which almost 70% is "strong").

We have however noticed, that in the midst of this general satisfaction, there is a noticeable minority who express negatively about the aid received. Two written comments clarify this situation: the group that chose to work with Juno data as a project felt abandoned during the second week, as all members of that project had to return to the USA for an important project meeting (see Appendix IV).

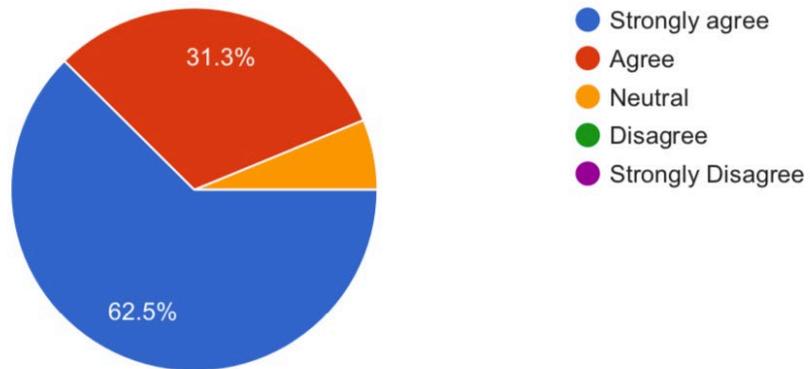


**Fig. 14- Evaluation of lecturers and supervisors**

A large majority of participants believe they will be able to use planetary science data in their future research, demonstrating a high level of confidence, and almost two-thirds believe they will be able to do so without much additional help (Figs. 15).

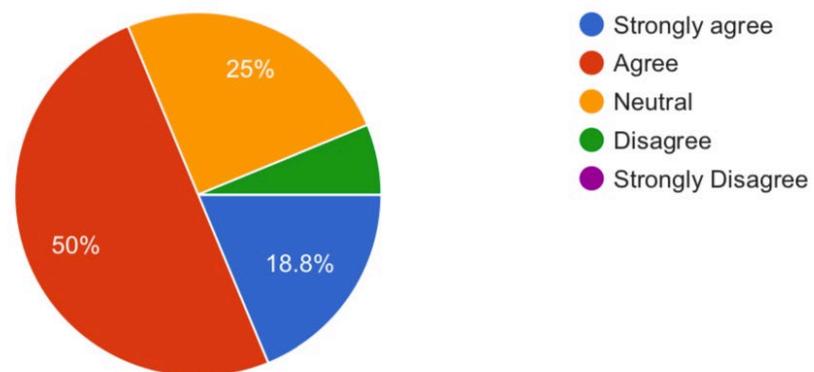
### The Future - I will be able to use planetary science data in my future research

32 responses



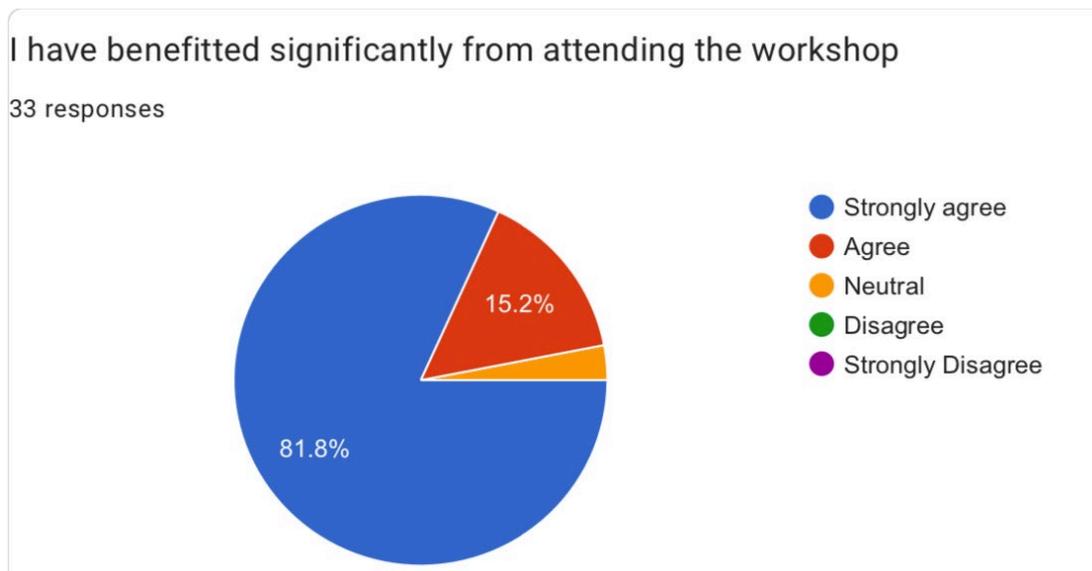
### I have learned enough to do this without much extra help

32 responses



**Figs. 15- Evaluation: Usage of planetary sciences data in the future**

Almost unanimously, the students feel that they have benefited significantly from their attendance at the workshop (see figure 16). This very high level of satisfaction does not differ much from previous workshops, which is always very comforting for us, organisers, teachers and supervisors. That this is not just a product of participants trying to please us is shown by the fact that they give critical opinions regarding some other aspects of the workshop, such as the financial support for travel, or the comments received regarding the two hours devoted to inclusion in IDEA, both discussed earlier in this report. The importance of this issue for Latin American students is reflected on the one hand in the high level of agreement with it, but also in the large number of written comments (with 25 being the most commented point of the evaluation). The fact that they are mostly negative about its implementation should not discourage us, but rather reinforce and motivate us to do better.



**Fig. 16- Evaluation of benefit of participation**

The accommodation including breakfast and the venue aspects have been highly valued. While the lunch in the simple university cafeteria scored surprisingly good for such a place, the dinner at the restaurant was satisfying only 50% of the participants. The worst valued aspect of the workshop was the internet at the hotel, something which has to be taken seriously into account in future events at the time of choosing the place to stay. Many students work late hours, especially in the final days, and this represents a challenge for hotels not used to have a large number of guests with high internet demand. Even if they offer an acceptable bandwidth, sometimes is the large number of connections the weak point. All these and other practical aspects, including the general comments (mostly very positive) to the workshop in general can be seen in Appendix IV.

I would like to thank first of all Prof. Gonzalo Tancredi, the scientific leader and inspiration for this workshop, who together with Prof. Millarca Valenzuela, Prof. Patricio Rojo and the entire local organising committee made the event possible. For the work and dedication also to all the speakers. Thanks also on behalf of COSPAR to the institutions that have contributed substantially to it: Universidad Católica del Norte, Universidad de Chile, Universidad de la República del Uruguay, NASA, ESA, the local sponsors Centro de Astrofísica y Tecnológica Afines, Instituto Milenio de Astrofísica, Sociedad Meteorológica and Sociedad Geológica de Chile, as well as the European Southern Observatory ESO and the company L3Harris, and the missions Juno, New Horizons, DART, Hayabusa I and II, Mars Express and Bepi Colombo.

Carlos Gabriel  
 COSPAR Panel on Capacity Building – Chairman  
 (and co-chair of this workshop)

## Appendix I - List of participants

#	SURNAME	NAME	GENDER	COUNTRY
1	Abraham	Valeria	Female	Uruguay
2	Agurto Gangas	Carolina	Female	Chile
3	Albomoz	Rodrigo	Male	Chile
4	Arboleda Bolívar	Sofía	Female	Colombia
5	Arcoverde	Plícida	Female	Brasil
6	Amijo	Javier	Male	Chile
7	Batalla Falcon	Grace	Female	Chile
8	Caviedes	Camila	Female	Chile
9	Chavan	Prachi Vaijanath	Female	Chile
10	Cristian	Rodrigo	Male	Chile
11	Duarte Vergara	Aaron	Male	Chile
12	Esteves	Leandro	Male	Brasil
13	Evangelista Santana	Marçal	Male	Brasil
14	Filice	Valerio	Male	Belgium
15	Guaimare	Alvaro	Male	Uruguay
16	Guamán	Gary	Male	Ecuador
17	Huaman Ticona	Victor	Male	Perú
18	Jimeno Ruiz	Nicole	Female	Bolivia
19	Liberato Mendes	Luana	Female	Brasil
20	Lins Leal Pinheiro	Tiago Francisco	Male	Brasil
21	López García	Karina	Female	Mexico
22	Madeira	Gustavo	Male	Brasil
23	Mantegazza	Mara	Female	Argentina
24	Martino	Silvia	Female	Uruguay
25	Monteiro	Filipe	Male	Brasil
26	Montoya Pérez	Miguel Angel	Male	Mexico
27	Pandey	Nitya	Female	Chile
28	Peralta	Teresa	Female	Chile
29	Pereira	Chrystian	Male	Brasil
30	Pereira	Wesley	Male	Brasil
31	Ribeiro do Amaral	Laura Neves	Female	Mexico
32	Rojas	Maria Carolina	Female	Argentina
33	Rossignoli	Natalia	Female	Argentina
34	Saavedra	Marcela	Female	Argentina
35	Trógolo	Nair Elisa	Female	Argentina
36	Uchida	Yuki	Male	Japan
37	Ximena	Contardo	Male	Chile
38	Zain	Patricio	Male	Argentina

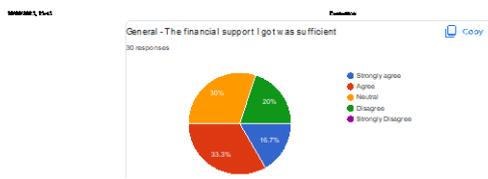
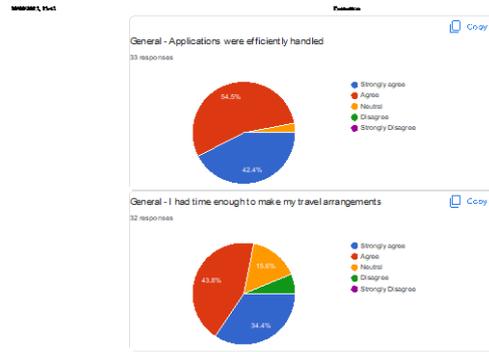
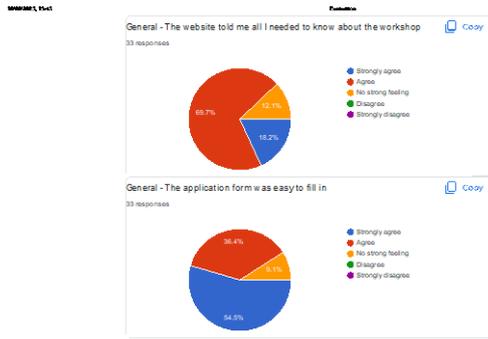
## Appendix II - Lecturers / Supervisors

<b>Name</b>	<b>Surname</b>	<b>Affiliation</b>	<b>Country</b>
Frederic	Allegrini	Southwest Research Institute	USA
James	Bauer	University of Maryland	USA
Scott	Bolton	Southwest Research Institute	USA
Terik	Daly	Johns Hopkins University	USA
Carlos	Gabriel	COSPAR	Germany
Connerney	Jack	Goddard Space Flight Center	USA
Steven	Levin	Jet Propulsion Laboratory	USA
Simon	Porter	Southwest Research Institute	USA
Lucie	Riu	European Space Agency	Spain
Javier	Suárez Valencia	Jacobs University Bremen	Germany
Seiji	Sugita	University of Tokyo	Japan
Gonzalo	Tancredi	Universidad de la República	Uruguay
<b>On-line</b>			
Inés	Belgacem	European Space Agency	France
Antonio	Bertachini	Instituto Nacional de Pesquisas Espaciais	Brasil
Katherine	Crombie	Indigo Information Service	USA
Tony	Farnham	University of Maryland	USA
Michael	Küppers	European Space Agency	Spain
Hal	Levison	Southwest Research Institute	USA
Jack	Wright	European Space Agency	Spain

### App. III – Projects

<b>Project title</b>	<b>Team members</b>	<b>Supervisor</b>
Spectral analysis of different regions of Ryugu: Data from NIRS3 and ONC instruments	Filipe Monteiro, Marçal Evangelista, Karina López	Lucie Riu
Analysis on crater colors on Ryugu	Natalia Rossignoli, Marcela Saavedra, Nair Trógolo	Seiji Sugita
Global spectral analysis of asteroid Ryugu in the near infrared	Patricio Zain, Plicida Arcoverde, Wesley Pereira	Lucie Riu
Global distribution of bright boulders in Hyugu surface from OCN-T observations	Chrystian Pereira, Leandro Esteves, Gustavo Madeira	Lucie Riu
Global spectral analysis of asteroid Ryugu in the near infrared	Mara Mantegazza, Valeria Abraham, María Carolina Rojas	Lucie Riu
Detection of CO <sub>2</sub> and H <sub>2</sub> O ices at the South Polar cap of Mars	Camila Caviedes, Aaron Duarte	Lucie Riu
Mars image and spectral data procesing, SPRC interaction with dust storms	Laura Neves, Javier Armijo	Javier Suarez, Lucie Riu
Study of the Geometry of Some Craters near Stickney	Nicole Jimeno, Yuki Uchida	Terik Daly, Javier Suarez
Jupiter atmospheric feature indentification using Juno's MWR	Teresa Peralta, Miguel Montoya, Cristian Rodrigo, Gary Guamán	Steven Levin
I-SCAPE with Juno Data	Prachi Chavan, Carolina Agurto, Sofia Arboleda, Grace Bat	Scott Bolton / Lucie Riu
Analysis of impact ejecta on Ryugu	Tiago Pinheiro, Luana Liberato, Silvia Martino	Gerbs Bauer
Analysis of meteorological data from Mars, through REMS on Mars	Victor Huaman	Gerbs Bauer
Probing the outer solar system with New Horizons	Nitya Pandey, Rodrigo Albornoz	Simon Porter
Analysis of the gravitational potential in different regions of Itokawa	Alvaro Guaimare	Terik Daly

# Appendix IV – Full results from the evaluation form



**General - Comments?**

19 responses

The financial support was not sufficient, due to the constant devaluation and inflation in Argentina.

I wanted to know your recommendation of the nearest hotel and the arrival time as soon as possible.

The travel arrangements were made late because I had to receive approval from NASA for the trip. It worked out in the end.

No

none

The questions where I answered "Neutral" were the ones that, in my case, I think don't apply, because I was gonna be in Antofagasta anyways.

Was a very nice experience, but the IDGA was a little strange

It was a short time between the time we received the promotion of the workshop and the event date. A bit more time would be nice to better fit the CB on our schedules and to buy the plane tickets.

The website were very useful, maybe one thing could be done is to publish the inviters earlier in the reason to schedule your travel better.

None

not financial support

COGPAR 2023 was my first international encounter with other students and researchers from all over the world. I think that I leave from Antofagasta with a very good feeling about all the experience.

It would be good that software required would be announced with more previous time

As for the website, I thought it was a bit incomplete and more information about which lectures or projects required which programs was needed. Also, a short abstract about each lecture would be very useful.

As for the financial support, being Argentinian the flight cost was really expensive for me (650 dollars only with carry on luggage), that is why in my opinion the financial support was not enough. Nevertheless, I thank the organizers for the financial support given and understand that it is a challenging issue.

On another topic, I would have liked to start the first day of COGPAR with a short round of introductions of each lecturer and student, to get to know each other.

It was a really enriching experience for me. My area of work is more related to cosmochemistry, however the fact of being able to learn and enjoy the passion and patience to teach us has opened my interest to explore fields that I really did not know. The impeccable organizing team, I feel very grateful to have shared with them and thank you for everything you did to make us feel as comfortable as possible.

It was a very informative and interactive workshop that helped me to learn a lot of methods of planetary data analysis. It would have been helpful if the program details (topics and lecturers) were provided few weeks before the workshop.

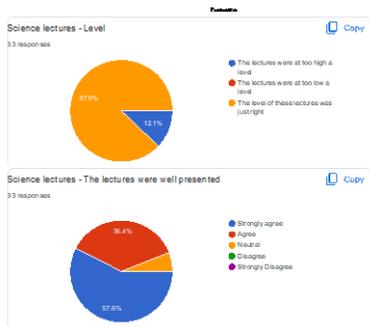
Thank you for paying the staying and travel expenses. I was able to attend this workshop due to this support.

I would have been nice to have the full lectures and programme earlier than it was.

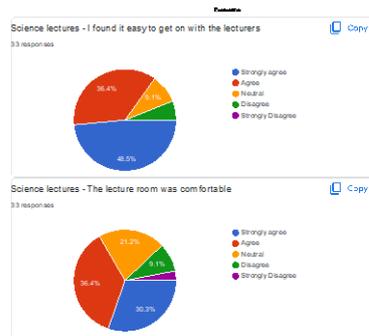
La mayoría de los días fue mucha información, por lo cual resultó muy agotador. Sin embargo todo fue muy interesante y me enriqueció con muchas herramientas para mi carrera, hice



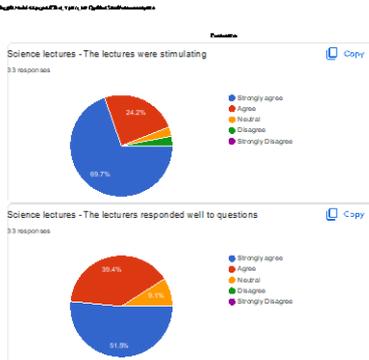
MS00001, F141



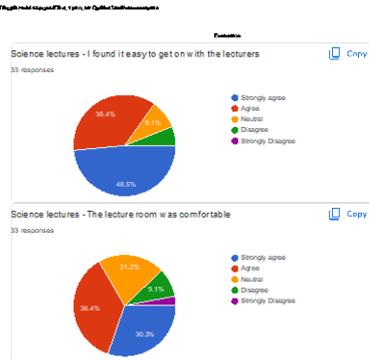
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**Feedback**

Science lectures - Comments? Were there any topics you would have found especially useful?  
20 responses

The processing data

Interesting, but sometimes it is hard for me because of my lack of English, scient fo and archive data knowledge.

A more in-depth poll about the skills and fields of research from the students would have helped prepare more focused and relevant lectures.

All science lectures should be concentrated in the first week, allowing more options of projects to work hard in the second week.

Manage of data.

The chairs were quite uncomfortable and tilted, making note-taking difficult. In relation to the classes, I appreciate that they are recorded

I felt that the workshop was very useful and interesting, but strongly biased towards geology. I understand that the aim was to learn how to use space missions data, but the tutors could have tried to provide some more explanation and information on some other data we could use without geology.

All the lectures were very interesting and useful.

planetary Atmospheres

excelentes presentaciones, me encantó todo!

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**Feedback**

Just a few technical aspects have to be better handled, like the sound, the projectors and all that.

Mars Express and MRO lectures about the data and what we can do with this information some of the lectures with the younger lecturers were more 'stimulating', besides the more technical ones were quite hard to follow.

Enjoy a lot the presentations, they were very clear and I could learn as a good example and also I have learnt a lot of content from this workshop.

It would be nice that the lecture room has also tables, so in software lectures is easy to follow using a laptop.

That was interesting to me, in particular, asteroid missions.

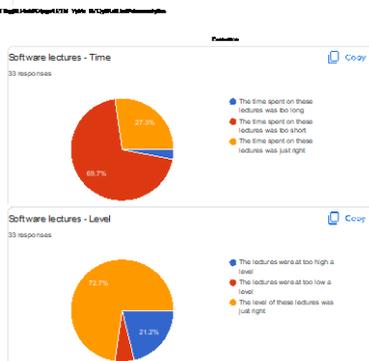
The JUNO mission lectures were interesting though I was expecting more insight into the Rosetta mission.

The lectures on Hayabusa 2, Mars Express and Dart were the most useful because they provided me with more information and insights that I had not taken into account or that I had not been able to fully understand before.

I would have found interesting a deeper discuss of spectrometric and photometric processes of the instruments of the missions to understand better the data available

En general las charlas que involucraron el análisis mineralógico a partir de datos espectrales

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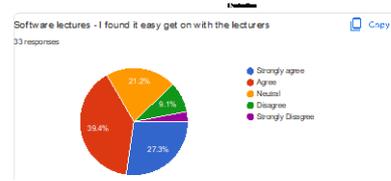
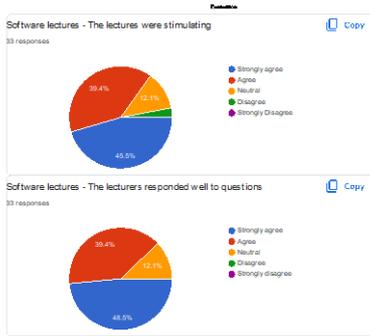
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**Software lectures - Comments**  
21 responses

Maybe we needed more time to practice with the software

I could not catch up with the speed of the class.

none

The software classes were a bit fast, but I appreciate that they are recorded

I wish we have had more time to work on each software and learn how to use it properly, instead of just watching the lecturers most of the times.

About the software lectures, I think it is possible to spend more time on it, because we can practice better. Another thing is the internet, some programs require fast internet.

very good

yo soy frecuente con la programación y tuve varias dificultades con algunos procesos y bajada de datos, pero me ha servido muchísimo para aprender y me llevo mucha información y conocimiento que seguiré desarrollando

They were very valuable for me

I would've liked more time on software lectures.

they were just right and useful, but given the PC requirements of the programs and the detailed use it was a little hard to follow live

I think that it would be better if the main topics would presented the first week, because some of the instruments or topics were presented in the second week so if you want to work with

this data the time is too short.

I appreciate a lot the time of the software lectures, they were open to questions and to explain in details. Also I want to thank to Lucie and Aurélien, that found a special time to give us a lecture about Omegasy.

It would be nice a bigger room, or one that has bigger screen. From the back, it was not possible to watch well

In the lab it was a bit difficult to see the projected screen. Maybe it would be useful to have the lecture with the steps or links before hand in a pdf to ease the reading and following.

Maybe, more time for software lectures.

I found the software classes very fast, with very little time to follow the teacher in the examples done in class.

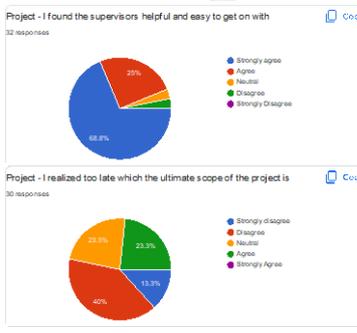
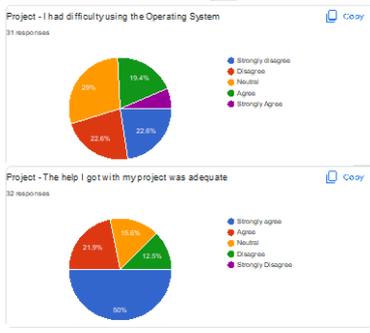
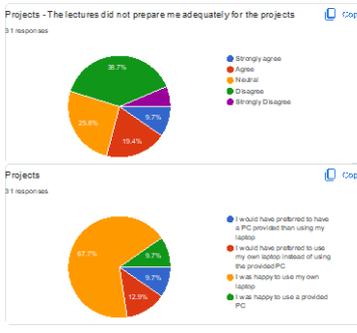
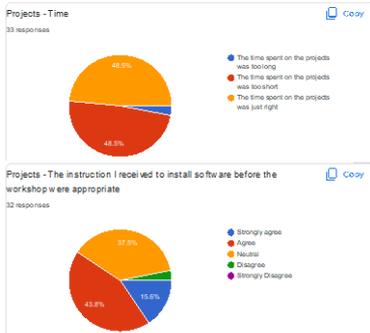
the software used were interesting, we had all the support to be able to solve problems and together find alternatives to process the data.

The software lectures were informative.

I am not really good at programming, so it was a challenge to understand and keep up with the software lectures. However, the way the lecturers explained and gave us examples encouraged me to put more effort into programming from now on.

Some of the lecturers were not really involved in the hand on work with software which was a limitation sometimes when we were trying to do specific things with data

Muy interesante las aplicaciones, pero se requiere mucho más tiempo para explorarlas.



Project - comments

19 responses

It would have been better to start working in the projects after all the different missions and tutors were presented. For example, I started working on Hayabus2 before hearing the DART lectures. However, I understand the difficulty of matching everyone's schedules.

I could not bring my own computer and I had to struggle a little with the ones on the PC lab. Mostly because they run on windows (who uses windows nowadays?) and the software was not installed in all computers. After the first work days, I finally settled on one computer and had no further problems.

The software and applications which I had pre-installed failed for unknown reasons, and I wasted a long time. I can't help it, but it's so frustrating!

None

I like my project, but to have better results, I think is necessary to expend more time than 3 days.

The schedule wasn't very kind to the students ehhe The missions presented on the second week were impossible to work on because we would have just one day for it. I suggest to put all lectures on the beginning of the workshop and separate the last days only to work on the projects.

I think the results of my project is very interesting and could be published in the future.

como indicadores, algunas dificultades con los procesos y con algunos datos, pero que estoy resolviendo y aprendiendo y continuare trabajando para conectar con investigacion previa de la Luna

Thanks to Lucie and Javier, they were very good with us



I wish I had entered my current project before, because of my advisors. I tried to work with Juro and me and my group became so frustrated. We did everything we had to do, but every time we asked for help, our advisor always gave pretty confusing answers. We understand that they have scripts to support the project, but they don't. They also don't even have a project proposal or a plan to follow, we did it all ourselves. After trying to adapt the project and ask for help from other advisors (that don't even in the project, but were so kind to help) we had to change of project and begin from the scratch.

I was quite lost when we started with the projects, I think we lacked orientation or some ideas proposed by the tutors, once the initial idea was set it became easier to deal with the project and make it through. The younger lecturers were really helpful with their software knowledge and guidance

In my case the most part of the workshop was to learn methodologies and softwares to analyze different types of dat. Even though I couldn't reach any specific result I learn A LOT about the data analysis.

First, I want to thank all the supervisor for coming. On the other hand, at the beginning of the work in project I had chosen other project that wasn't able to carry out because the data from Rjogu of the Hayabus2 wasn't open data (latitude and longitude of each images wasn't available for the attendants of this workshop). However, I chose another project that it is really interesting and useful for doing some research to apply on my PhD.

Some of lectures had designed projects, but not all of them. We didn't have good advice about what topic to choose, at the end we couldn't get any help developing our project.

The time for working on projects was too short. This let us too little time to get results and make the presentations. I would have liked two full days of working on projects or alternatively three full consecutive afternoons (without any lectures). I learned a lot while doing the project and was really interested in other projects as well, so I think it is a really unique and interesting factor about cospar.



I learned a my new things. The project has really been a very enriching experience. I did not know most of the softwares, however we were able to achieve our goal working as a team.

I liked working on projects with the new methods but I would have loved to spend more time working on them.

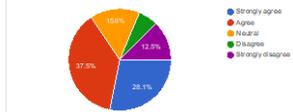
Despite the fact that I struggled using the required software due to lack of knowledge, I enjoyed and loved the opportunity to work with new people from different research areas.

For my group, though it was our choice to work with some specific data, it would have been nice to receive some advice of let down a project that had no real near future, at least at the short time we got, so I think a real and sincere but strong advice was needed

El proyecto que trabaje con mi equipo fue super emocionante, pero sin duda fue de suma importancia la colaboracion de todos para poder llevarlo a cabo. Los avances y las posibilidades de continuar me entusiasmaron muchisimo.

The inclusion of a 'round table' on Inclusiveness, Diversity, Equity and Accessibility (IDEA) was a good idea.

32 responses



sure is that those matters needs to be talked about, and good for COSPAR for including that opportunity.

It was a good idea to include a diversity session with what I thought would happen, but in reality it was quite disappointing watching the ladies speaking and giving presentations instead of initiating some kind of discussion with the public that went back and forth.

I was very excited for the IDEA panel and it was a big disappointment, mainly because it wasn't a discussion panel it was an exposition. If the idea of IDEA is to achieve the inclusion, diversity, equity and accessibility its is fundamental the participation of people with disabilities, with less resources, people of other ethnic and cultures, people from the LGBTQ+ community and so. Nobody knows more about the difficulties of been excluded than the ones who actually lives that reality.

Another comment that I would like to do is that it would be more interesting that the panel was ended a discussion panel and let the students participate in the debate. The question and comments send by us was only discuss by the presenters...that was not that any of us was expected.

I think it was more of an exposition than a debate. However, I think it is a good idea to have this kind of sessions to make some changes on the next future about inclusiveness, diversity, equity and Accessibility. Moreover, I think the people in charge of this session were white blond women from First world countries, and I think that isn't representative of main idea of the IDEA.

It would be better to have a real discussion session instead of only have lectures about it, it would be great like a debate panel with the students and lectures.

I would have liked it to be a debate with the students and lecturers, where we can present our views on different subjects. In fact, both the comments need by the virtual presenters were sent by me but there wasn't any time to actually discuss the topics and hear the other students views. Despite this, I think it is definitely important to have this kind of sessions.

I'm sorry I can't attend, but I think it is an important aspect.



It was not much useful as we were not able to have a good interaction and did not get much satisfying answers.

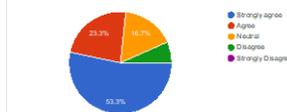
A round table like IDEA seems to be a great space to acknowledge the problematics and lack of inclusion of different groups in the academic world. However, it was more like another lecture than an exchange of experiences, ideas and solution proposals and there was no diversity among the people who organized this round table.

It was not designed for real participation of the whole workshop participants, and the idea of giving the questions before the panel to let them discuss alone was not really good. Maybe it would be better to include more diversity not just in IDEA session but in the whole program of the workshops, and let this discussion spaces open to the public to speak and debate.

Fue una muy buena idea, pero falta mucho trabajo porque no hay representacion diversa.

Accommodation and Venue - The flight to Chile was efficiently done

30 responses



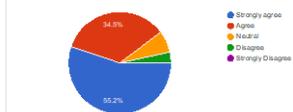
The local transport to Antofagasta was efficiently done

29 responses



The room at the hotel Alto del Sol was good

29 responses



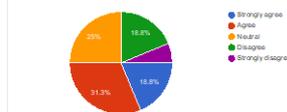
The food at the UON was good

33 responses

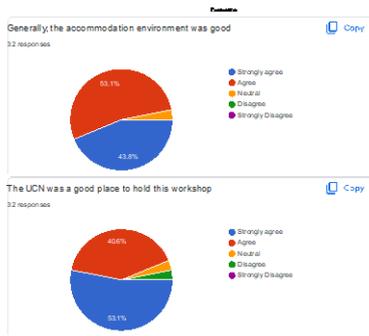


The food at the restaurant M itad del Mundo was good

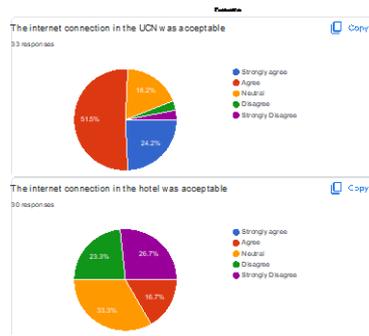
32 responses



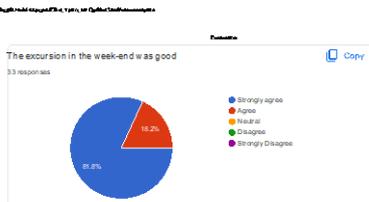
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**Comments to Accommodation and Venue**

19 responses

As a vegetarian I had to struggle a lot to get proper meals in Chile in general, and particularly in the restaurant. The food at the UCN was great, but the way they handled vegetarian food at the Mitad del mundo was terrible. The first days, we only had salad. Then, the meals were mostly the same plates than the ones with meat, but without the meat. That means vegetables only no protein. The restaurant people manifested to ignore absolutely everything about vegetarian diets, which was very demoralizing at times. In this regard, I had a situation on the second week with one of the organizers when I complained that our plate in the restaurant that night had, once again, no protein. I was answered that the human body can survive a day without protein. Not only that answer was extremely inappropriate, since but also unfair since the carnivore version had plenty of protein. I hope next events have more kind considerations towards vegetarians and vegan people.

I wanted to know your recommendation of the nearest hotel and the arrival time as soon as possible.

We miss our connection flight and when we arrive there was no transport for us. I think it would be nice to extend the time for the transport considering this could had happen.

The restaurant Mitad del mundo had a really poor attention. Everything that we asked had a "no" for answer (soft, bread, another glass of coke, mayonesa, ketchup, seasonings, etc.). They barely gave us enough water. They were not very inclusive with the vegan and vegetarian people (they didn't even understand the difference between vegan and vegetarian).

It was great. Thank you for organizing all of this.

None

It was good

Alto del Sol is very comfortable hotel and well located

MSM001, 1st-1

so good

At the hotel Bad internet, good breakfast, but it was OK

I was at my home, so I can't comment on the accommodation.

the hotel was quite good, the breakfast was decent and had little fruit and fresh food, the restaurant for dinner was disappointing from the way the waitresses treated us to the variety and inconsistency of the food (quantity and quality).

The meals at Mitad del Mundo were very poor, especially for the vegetarian and vegans.

The hotel was very good. However, I think that the food at the restaurant Mitad del Mundo was limited.

Probably not the whole hotel, but particularly our room has broken window, exceptist told us from the first day. Has problems with ventilation and also with the bathroom door. The last day I was trapped inside, and they need to broke it.

Thank you very much for the accommodation and venue selections. They were absolutely great! All for the excursion, the searching for restaurants was a good idea but too long in my opinion (because of the exposure to sun and going to two pieces instead of directly to the last one)

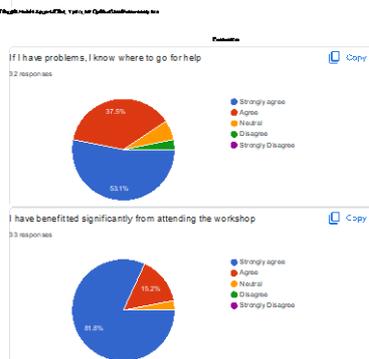
I felt comfortable and I had fun.

It was arranged efficiently

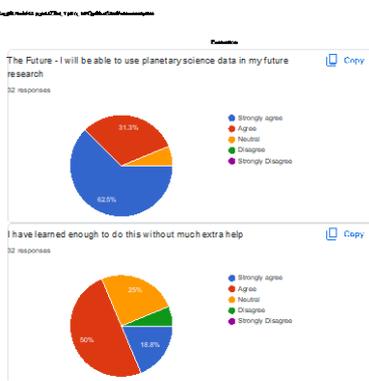
It was really good and comfortable, thank you for all that support.

Quiero agradecer especialmente a los compañeros que estuvieron ayudando con todos los procesos logísticos.

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**General comments (on anything whatever) to do with the workshop**

21 responses

The workshop was a very formative experience for me. I'm a doctor in Astronomy and postdoctoral student, since my work has been numerical so far, this is the first time I worked with actual data coming from a spacecraft that went to a body in the solar system. Finding out that all the data available in the PDS was a big reveal. I feel that this leads the way for a lot of research done in my university working with data from many missions.

Gracias!

I think a good idea would be not to have whole days of lectures, but to combine this with computer work. Maybe the first week having talks in the morning, and in the afternoon (or the second half of the afternoon) have to solve some problem with software. Then from those problems to be able to propose the projects. I think that the projects were not very well outlined and since we had little time it would have been better to have some clearer guidelines. In any case, I understand that you had to put together the schedule as you could, depending on the availability of the panelists, so perhaps it is not very feasible to combine talks and work with software every day.

Thank you. It was an amazing and inspiring experience.

I think could be very useful to invite software programmers, they can introduce students to new technologies like AI.

Sorry about the lack of comments, but I don't have much to say or comment on.

Thanks for the instance and opportunity with persons with high knowledge

It was an amazing experience and I'm glad I was selected to participate. For sure I'll use knowledge I obtained from the workshop in the future and I'm glad for all the friends I made here. Thank you!

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