Report on the IAU/COSPAR Capacity Building Workshop
"JWST Data Analysis and Processing Workshop (South East Asia) "
in Chiang Mai, Thailand - June 2024

Carlos Gabriel – COSPAR Panel on Capacity Building
Mariano Méndez – IAU Hands-on-Workshops

I – Introduction

The workshop took place from 24 June to 5 July 2024 at the Kantary Hills Hotel and Service Appartments in Chiang Mai, Thailand. Organised mainly by the COSPAR and I-HOW Capacity Building initiatives, it was supported by international organisations, such as the space agencies ESA, NASA and JAXA, and the Spanish Centro de Astrobiología, as well as by the local sponsor NARIT, the National Astronomical Research Institute of Thailand.

The workshop was proposed and locally organised by Dr. Nicha Leethochawalit and other colleagues from NARIT.

The workshop aimed to train students and researchers in using public data from the James Webb Space Telescope (JWST) for scientific research. It focused on the data from the NIRCAM, NIRISS, NIRSPEC, and MIRI instruments. Participants were able to gain hands-on experience downloading, reducing, and analyzing JWST data, using examples from different scientific cases for each instrument as well as own chosen data for individual projects. The workshop also aimed to foster collaboration among astronomers in Southeast and South Asia, building on previous efforts like the IAU Symposium 377 and a recent workshop on Freeform Optics. Space Telescope Science Institute's JWebbinars material and JWST data available on the MAST and ESA archives were utilized.

Details about the whole event, including the program, can be found under the IAU I-HOW (https://www.iau.org/training/iau-hands-on-workshops/), and the COSPAR Capacity Building Program web pages (http://cosparhq.cnes.fr/Meetings/Workshops.htm), and under the local web page of the workshop (https://indico.narit.or.th/event/203/).

II – Participants

A total of 40 participants (also known as students) were selected out of a total of 128 candidates. The distribution of the selected students according to region, background and nationality can be seen in Figure 1.

Most of the undergraduate students were local to Chiang Mai, their selection was consciously made as an effort to promote local space science activities, increasing the number of participants originally envisaged at low financial costs to the organisation.

As usual, all non-local students received full lodging during the two weeks and travel subvention (around 90% of the actual travel costs). Meals and coffee breaks as well as the costs of the excursion were covered for all the participants.

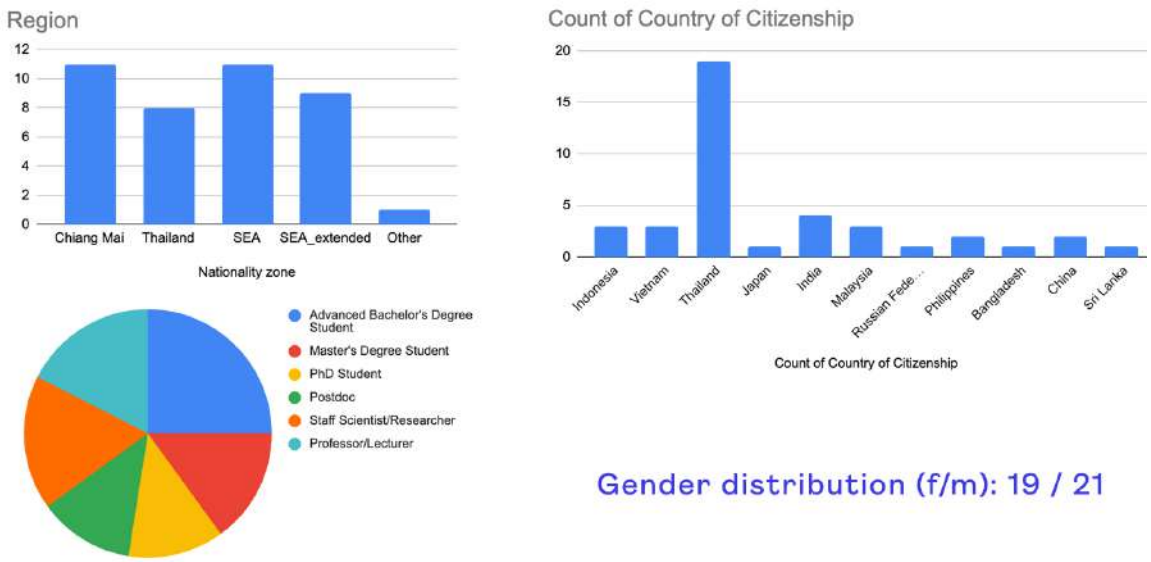


FIG 1: Regional, national, background and gender distribution of participants

The geographical distribution of the students revealed a broad regional distribution. The even gender distribution was not forced, but arose naturally from the selection process, which did not take gender into account as a criterion. The full list of students including affiliation and nationality is given in Appendix I.

III – Lecturers

The list of lecturers including affiliation follows:

Prof. Luis Colina	Centro de Astrobiología, Spain	Scientific co-leader
Dr Nicha Leethohcawalit	NARIT, Thailand	Scientific co-leader
Dr. Javier Alvarez	Centro de Astrobiología, Spain	Lecturer / supervisor
Dr. Carlos Gabriel	COSPAR, Germany	Lecturer / COSPAR organiser
Prof. Mariano Mendez	University of Groningen, the Netherlands	Lecturer / IAU organiser
Dr. Themiya Nanayakkara	Swinburne University of Technology, Australia	Lecturer / supervisor
Dr. Isabel Rebollido Vazquez	European Space Agency, Spain	Lecturer / supervisor
Dr Samapom Tinyanont	NARIT, Thailand	Lecturer / supervisor
Prof. Xin Wang	University of Chinese Academy of Sciences, China	Lecturer / supervisor
Dr. Christopher Wilmer	Steward Observatory, USA	Lecturer / supervisor

Except for Gabriel and Méndez, who have participated in many previous workshops, for all other lecturers this was the first experience ever with a COSPAR or IAU CB workshop, although all of them, without exception, had previous experience with astronomy schools. Particularly important is the young age of most of the lecturers, which reinforces the future continuity of our initiatives.

In addition to the face-to-face lectures, we had online lectures given by:

Prof. Félix Mirabel	Universidad de Buenos Aires, Argentina
Prof. Marcia Rieke	University of Arizona, USA
Prof. Michele Trenti	University of Melbourne, Australia
Prof. Eva Villaver	Agencia Española del Espacio, Spain

VI – Program

From the program (Fig. 2) it can be seen that this workshop was structured differently to our traditional workshops, with approximately 35% of the time dedicated to science lectures, 15% to lectures on missions' specifics (spacecrafts, instruments and data analysis software) and 50% to the projects the students had to carry out. In this ocassion a lot of time went into lectures on missions' specifics, including data reduction exercises performed using Jupyter notebooks. A good portion (50%?) of this time should count as part of the projects work. If we do so, the proportions of science / mission specifics / projects are 26% / 16% / 58%. The difficulties posed by the large number of JWST observation modes and corresponding reduction pipelines explain this.

Fig. 2 – The program

Time (hrs)	Program	Notes
Day 0		**Sunday - 23 June 2024**
	Arrival and hotel check-in	
Day 1 - Introduction/ MAST data retrieval		**Monday - 24 June 2024**
08:00-09:00	Registration	Doi Luang Room (2nd floor of the conference building)
09:00-09:25	Opening	Dr. Wiphu Rujopakarn (NARIT's Deputy Director)
09:25-09:30	Workshop Photo	
09:30-09:40	Introduction to COSPAR Capacity Building Workshop	Dr. Carlos Gabriel
09:40-10:40	Introduction to JWST and their instruments	Prof. Luis Colina
10:40-10:50	Break	
10:50-12:00	Modes of JWST observations	Dr. Nicha Leethochawalit
12:00-13:30	Logistic announcement + Lunch	
13:30-15:00	JWST data access and retrieval	Dr. Krittapas Chanchaiworawit
15:00-15:15	Break	
15:45-17:00	APT/MPT + data models (I)	Dr. Samapom Tinyanont
17:00-18:00	Free time / unwind / get ready for dinner	
18:00-19:30	Conference Dinner	Ekathip Chokedee Restaurant - เอกทิพย์โชคดี (transportation provided)
Day 2 JWST imaging (NIRCam)		**Tuesday - 25 June 2024**
09:00-9:45	**Special Lecture:** Twenty-five Years to Make NIRCam a Reality	Prof. Marcia Rieke (online)
9:45-10:30	NIRCam Imaging (I) + NIRCam (**science talk**)	Dr. Chris Willmer
10:30-10:45	Break	
10:45-12:30	NIRCam Imaging (II)	Dr. Chris Willmer
12:30-13:30	Lunch	
13:30-15:30	NIRCam Imaging (II)	Dr. Chris Willmer
15:30-15:45	Break	
15:45-17:00	NIRCam Imaging (IV)	Dr. Chris Willmer
17:00-18:00	Project time (free use of room)	

Day 3 JWST Imaging (NIRCam + Coronograph)		**Wednesday - 26 June 2024**
09:00-10:00	**Special Lecture:** Galaxies near and far as seen with MIRI	Prof. Luis Colina
10:00-10:15	Break	
10:15-12:00	NIRCam/MIRI coronagraphic science talk + NIRCam/MIRI coronagraphic imaging (I)	Dr. Isabel Rebollido
12:00-13:00	Lunch	
13:00-15:00	NIRCam/MIRI coronagraphic imaging (II)	Dr. Isabel Rebollido
15:00-15:15	Break	
15:15-16:30	NIRCam/MIRI coronagraphic imaging (III)	Dr. Isabel Rebollido
16:30-18:00	Project time (free use of room)	
Day 4 Datalabs + JWST spectroscopy (NIRSpec)		**Thursday - 27 June 2024**
09:00-10:30	Spectroscopic mode stage2	Dr. Themiya Nanayakkara
10:30-10:45	Break	
10:45-12:30	NIRSpec MSA (I)	Dr. Themiya Nanayakkara
12:30-13:30	Lunch	
13:30-14:30	NIRSpec MSA (II)	Dr. Themiya Nanayakkara
14:30-15:30	**Special lecture:** Space Telescopes	Prof. Michele Trenti (online)
15:30-15:45	Break	
15:45-16:45	NIRSpec MSA (III)	Dr. Themiya Nanayakkara
16:45-18:00	Project time (free use of room)	
Day 5 JWST spectroscopy (WFSS)		**Friday - 28 June 2024**
09:00-10:00	NIRISS WFSS (I)	Prof. Xin Wang
10:00-10:15	Break	
10:15-12:30	NIRISS WFSS (II)	Prof. Xin Wang
12:30-13:30	Lunch	
13:30-14:30	NIRISS WFSS (III)	Prof. Xin Wang
14:30-15:15	NIRCAM WFSS (addition/difference steps from NIRISS WFSS)	Dr. Chris Willmer
15:15-15:30	Break	
15:30-16:30	**Special lecture:** What can we learn about Exoplanets with the Webb Telescope?	Prof. Eva Villaver (online)
16:30-18:00	Project time (free use of room)	
Day 6 Excursion (Meet up at 8:00 AM in front of the lobby)		**Saturday - 29 June 2024**
Day 7 Freeday		**Sunday - 30 June 2024**

Day 8 JWST spectroscopy (IFUs)		**Monday - 1 July 2024**
09:00-09:20	NIRSPEC science talk	Dr. Themiya Nanayakkara
09:20-09:40	NIRISS WFSS science talk	Prof. Xin Wang
09:40-10:00	MIRI/NIRSpec IFU science talk	Dr. Javier Alvarez Marquez
10:00-10:15	Break	
10:15-12:30	MIRI/NIRSpec IFU (I)	Dr. Javier Alvarez Marquez
12:30-13:30	Lunch	
13:30-15:00	MIRI/NIRSpec IFU (II)	Dr. Javier Alvarez Marquez
15:00-15:15	Break	
15:15-16:30	ESA Sky+Datalabs	Dr. Carlos Gabriel
16:30-18:00	Project time (free use of room)	
Day 9 Project time		**Tuesday - 2 July 2024**
09:00-09:45	**Special talk:** How to give a good presentation	Dr. Carlos Gabriel
09:45-10:30	Project time	
10:30-10:45	Break	
10:45-12:30	Project time	
12:30-13:30	Lunch	
13:30-14:15	**Special lecture:** Statistics	Prof. Mariano Mendez
14:15-15:30	Project time	
15:30-15:45	Break	
15:45-16:30	Project time	
16:30-18:00	Project time (free use of room)	
Day 10 Project time		**Wednesday - 3 July 2024**
09:00-10:30	Project time	
10:30-10:45	Break	
10:45-12:30	Project time	
12:30-13:30	Lunch	
13:30-14:30	Project time	
14:30-15:30	**Special lecture:** Black hole feedbacks and gas-rich mergers in the first massive galaxies	Prof. Felix Mirabel (online)
15:30-15:45	Break	
15:45-16:30	Project time	
16:30-18:00	Project time (free use of room)	

Day 11 Presentation		**Thursday - 4 July 2024**
09:00-10:30	Presentation (8 presentations of 10-12 minutes)	
10:30-10:45	Break	
10:45-12:15	Presentation (8 presentations of 10-12 minutes)	
12:15-13:20	Lunch	
13:20-15:00	Presentation (9 presentations of 10-12 minutes)	
15:00-15:15	Break	
15:15-17:00	Presentation (9 presentations of 10-12 minutes)	
Day 12 Presentation + end of the workshop		**Friday - 5 July 2024**
09:00-10:15	Presentation (6 presentations of 10-12 minutes)	
10:15-10:30	Break	
10:30-11:30	**Special lecture:** Writing (successful) Proposals	Luis Colina
11:30-12:00	Diploma+Closing+Picture	
12:00-13:00	Lunch	

VII - The projects

The projects were in principle, as in many former occasions in astrophysics workshops, defined by the participants prior to the workshop. Many of them, however, could not be carried out for various reasons, or at least not to the expected extent. The time to develop the project was also partly insufficient and, in many cases, there was no data available for these projects; some difficulties in obtaining data from archives due to bandwidth saturation as well as processing difficulties worked against a greater use of the workshop in this respect. Nevertheless, all participants were able to perform data reduction and calibration tasks of various kinds.

The local organisers strived to organise a computing system in line with processing expectations, based on a Jupyterhub server hosted at NARIT's Chalawan high-performance computing (HPC) cluster. The computing team configured a dedicated node with 32 CPU cores and 320 GB of ram memory. The bottlenecks were that both the allocated ram and CPU cores were not sufficient for JWST data processing by the 40 participants of the workshop, especially JWST stage 1 data reduction (raw image reduction). Eventually that number was increased to 40 CPU cores, but the high demand remained a problem. For this reason, some participants opted to use their own computers for processing, although they also faced internet speed problems from the hotel.

An important lesson for future JWST workshops of this kind is the large volume of data and the complexity related to JWST for such a large group of participants. A pool of data to be analysed with the corresponding processing prepared in advance might optimize the results, especially for those cases where individual projects for one reason or another fail.

VIII- Results

At the end of the workshop each student gave a short presentation (10 minutes + 3 minutes discussion time) summarizing the results obtained. Practically all students stayed within the time available. A list of the individual projects is given in App. III. The results were very good, showing that all the participants understood the methodologies of the work in the field and most of them are in principle able to work with data and tools of at least one of the observation modes discussed after returning to their home institutes.

IX – Venue

The workshop took place in a conference hall of the Kantary Hills Hotel, where students and lecturers were half-board lodged (breakfast and lunch included), which was a big help to optimize the time. The excellent condition of the conference room in all aspects of audio-visual, transmission and recording of presentations (we used Zoom for external presentations as well as to provide online local ones, but also as a recording method) fully satisfied the requirements. Perhaps one or two smaller adjoining rooms could have facilitated project work for those working in groups, on the other hand the work tables were very convenient, and the venue large enough to work well.

X – Breakfast, Lunch, Dinner and Coffee Breaks

Breakfast and lunch were included in the hotel service. Coffee breaks were held twice a day in the large hallway adjacent to the conference room, in the morning and in the afternoon, and included some pastries or local delicacies.
The difficulty of finding a suitable place to have dinner together each evening was solved by providing pocket money for all participants, students and teachers. Near the hotel and all over Chiang Mai there were many small restaurants and food outlets, very convenient, easily accessible and with a wide variety of dishes.

XI – Lodging

The chosen hotel, Kantary Hills, was simply excellent in every respect for a workshop of this kind. Spacious, high quality double rooms for the students and single rooms for the lecturers, with water, coffee and tea facilities included. Two swimming pools and a free-to-use gymnasium as well as an executive lounge available for guests to work in a relaxed atmosphere rounded off an excellent offer. If we add that the use of the conference room was free of charge due to the large number of rooms occupied by the group, we have perhaps the best conditions ever obtained for one of our workshops, at least in the reporters' long experience of workshops.

XII – The excursion

On the Saturday in between we had an excursion for all participants, including the lecturers, to a fantastic elephant sanctuary, the Elephant Nature Park (https://www.elephantnaturepark.org), an elephant rescue and rehabilitation centre with more than 100 elephants. There we received a lot of information about these animals and their life there, after a former hard life, touring the park for several hours. We were even able to prepare a cake for the elephants, who had a hard time with two buffaloes wanting to take away their snack. We were very impressed by the excellent work they do in this sanctuary to recover the injured and traumatized elephants.

We then visited the National Radio Astronomy Observatory of Thailand, one of the NARIT facilities, located some 80 km from Chiang Mai. Staff led us on a tour of its two main antennas, the 40 m short millimetre single-dish telescope and a 13 m VLBI Global Observing System (VGOS) radio telescope as co-location, operating in the frequency range 300 MHz - 115 GHz. In the framework of the collaboration with VLBI arrays around the world, TNRT will dramatically improve the quality and performance of the images thanks to its unique geographical location.

XIII - General evaluation

We prepared and distributed an evaluation sheet among the students (App. IV), for getting feedback concerning the different aspects of the workshop, obtaining 33 answered evaluation sheets (> 82 %). As usual, a thorough analysis of the answers given seems necessary, going beyond the limits and scope of this report.

There is satisfaction with all general aspects of the workshop, without a single negative response. The relevant answers to the different questions vary only between agreement and strong agreement with the positive statement in the questions.

Software lectures are the most highly rated (70%) compared to science ones and project time, which is surprisingly different from previous workshops. The reason probably lies in the fact that this is where the participants perceive they have made the most progress, as they were interactive data reduction classes with Jupyter notebooks. The project time, traditionally chosen as the most valued in other astronomy workshops, fell short in this one and was limited by the technical problems mentioned above.

Regarding the level of the presentations there is a high degree of satisfaction, also with the time devoted to this part, as well as with the level of responses from the lecturers.

The problems that limited the project work time are clearly reflected in the opinions of the majority, who felt that the time devoted to the projects was too short. Here there is clear room for improvement by optimising resources, both in the preparation prior to a dedicated JWST workshop and in its technical planning.

On the other hand, the participants understand that the origin of the problems does not lie with the lecturers/supervisors. On the contrary, there is a high level of satisfaction with both their level and their dedication.

The level of professionalism in the local organisation as well as the general conditions of the venue and accommodation are also widely acknowledged, except for the most divergent issue in the entire survey: the level of internet in both the hotel and the conference room. This has to be attributed primarily to the enormous requirements of such a workshop rather than to shortcomings of the venue, which in principle has a very good level of connectivity.

This brings us to what we always consider the most important point of this survey: the future ability to work with the data from missions/facilities addressed during the workshop, which in this case receives a unanimous affirmative response, with two thirds 'strongly agreeing'. Finally, the question of whether participation in the workshop was beneficial was answered with a unanimous yes, with more than three quarters strongly agreeing.

Again, we would like to thank all the people (especially the local organisation committee and the lecturers) and the institutions that have substantially contributed to making possible this event: NARIT, IAU, COSPAR, ESA, NASA, JAXA and the Spanish Centro de Astrobiología.

Carlos Gabriel
Mariano Méndez

Appendix I - List of participants

No	Name	Lastname	Affiliation	Country	Gender
1	Krittapas	Chanchaiworawit	NARIT	Thailand	Male
2	Puji	Irawati	NARIT	Thailand	Female
3	Nahathai	Tanakul	NARIT	Thailand	Female
4	Ponlawat	Yoifoi	NARIT	Thailand	Male
5	Pakawee	Surarittikul	NARIT	Thailand	Male
6	Khemsinan	Gunsriwiwat	Chiang Mai University	Thailand	Female
7	Gunmethus	Cherdchoochavalit	Chiang Mai University	Thailand	Male
8	Onnalin	Innala	Chiang Mai University	Thailand	Female
9	Manasanun	Tanasan	Chiang Mai University	Thailand	Female
10	Wissarut	Jarernsupapon	Chiang Mai University	Thailand	Male
11	Chalisa	Srikum	Chiang Mai University	Thailand	Female
12	Taweewat	Somboonpanyakul	Chulalongkorn University	Thailand	Male
13	Nandan	Roy	Mahidol University	Thailand	Male
14	Kantapon	Jensangjun	Mahidol University	Thailand	Male
15	Nattaporn	Thongphaijit	Mahidol University	Thailand	Female
16	Chonticha	Kritpetch	University of Phayao	Thailand	Female
17	Sarith	Chopara	Mahidol University	Thailand	Male
18	Lapit	Lapinee	University of Colorado Boulder	Thailand	Male
19	Supphakit	Wiweko	Kasetsart University	Thailand	Male
20	Dieu	Nguyen	Centre de Recherche Astrophysique de Lyon	Vietnam	Male
21	Tuan-Anh	Pham	Vietnam National Space Center	Vietnam	Male
22	Lucky	Puspitarini	Institut Teknologi Bandung	Indonesia	Female
23	Nguyen	Thi Phuong	Vietnam National Space Center	Vietnam	Female
24	Jerome	de Leon	The University of Tokyo	Japan	Male
25	Azni	Abdul Aziz	International Islamic University Malaysia	Malaysia	Female
26	Adibah Nur	Zainol Abidin		Malaysia	Female
27	Anis Maisarah	Yassir Azlin	National University of Malaysia	Malaysia	Female
28	Sultan	Hadi Kusuma	Institut Teknologi Bandung	Indonesia	Male
29	Annisa Novia In	Putri	Institut Teknologi Sumatera	Indonesia	Female
30	Kim Cristine	Duka	Rizal Technological University	Philippines	Female
31	Mengting	Ju	University of Chinese Academy of Sciences	China	Female
32	Naval Kishor	Bhadari	Physical Research Laboratory	India	Male
33	Payel	Nandi	Indian Institute of Astrophysics	India	Female
34	Hang	Zhou	University of Chinese Academy of Sciences	China	Male
35	Rashi	Jain	National Centre for Radio Astrophysics	India	Female
36	Ahmad	Al - Imtiaz	Shahjalal University of Science and Technology	Bangladesh	Male
37	Yasith	Ramawickrama	University of Kelaniya	Sri Lanka	Male
38	Ekaterina	Koptelova	National Central University	Russia	Female
39	Abhay Pratap	Yadav	National Institute of Technology Rourkela	India	Male
40	Hayato	Tanaka	Institute of Space and Astronautical Science	Japan	Male

Appendix II - Lecturers / Supervisors

Prof. Luis Colina	Centro de Astrobiología, Spain	Scientific co-leader
Dr Nicha Leethohcawalit	NARIT, Thailand	Scientific co-leader
Dr. Javier Alvarez	Centro de Astrobiología, Spain	Lecturer / supervisor
Dr. Carlos Gabriel	COSPAR, Germany	Lecturer / COSPAR organiser
Prof. Mariano Mendez	University of Groningen, the Netherlands	Lecturer / IAU organiser
Dr. Themiya Nanayakkara	Swinburne University of Technology, Australia	Lecturer / supervisor
Dr. Isabel Rebollido Vazquez	European Space Agency, Spain	Lecturer / supervisor
Dr Samapom Tinyanont	NARIT, Thailand	Lecturer / supervisor
Prof. Xin Wang	University of Chinese Academy of Sciences, China	Lecturer / supervisor
Dr. Christopher Wilmer	Steward Observatory, USA	Lecturer / supervisor

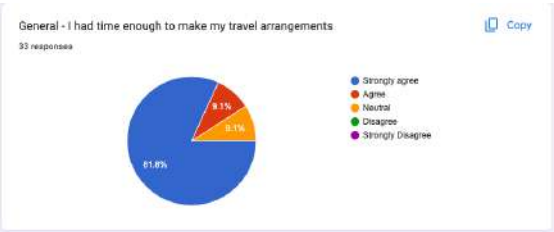
On-line lecturers:

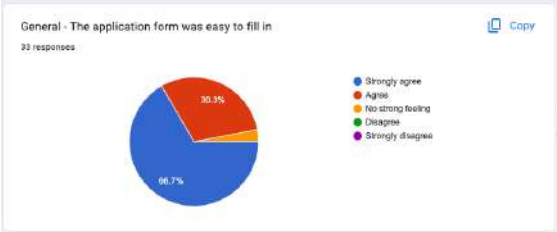
Prof. Félix Mirabel	Universidad de Buenos Aires, Argentina
Prof. Marcia Rieke	University of Arizona, USA
Prof. Michele Trenti	University of Melbourne, Australia
Prof. Eva Villaver	Agencia Española del Espacio, Spain

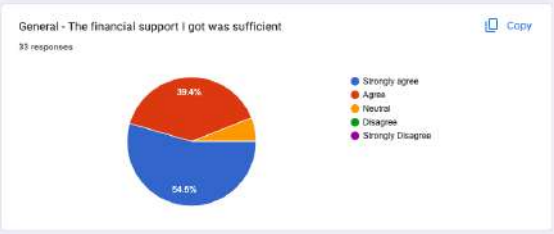
App. III – Projects

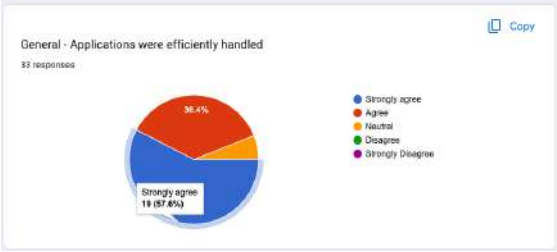
Burstiness of Star Formation throughout Cosmic Time according to JWST
Search for Planetesimals in White Dwarf Binaries
PSF photometry of JWST NIRCAM data
PASSAGE Spectra Reduction
Imaging the Giant Planets with JWST
PSF photometry of Draco II by usinNIRCAM data
Machine Learning for parameters of High-redshift galaxies
How many low-mass star contaminants are classified as High-redshift galaxies.
Transformation of JWST data to ARRAKIHS as cosmological background models
MACS1149-JD1 Spectrum Profile
The properties of galaxies in the MACS J1149.5+2223 field with JWST NIRSpec
Finding photometric redshift of high redshift galaxy
Investigating gas kinematics and spatial extension of AGN-driven outflows
Evolution of axial ratio distribution of galaxies across 13 billion years of the universe [only NIRCam1]
Observing a high-redshift galaxy (GL-z10) using NIRCam images
Reprocessing the Spectrum of the Direct Observed Exoplanetary VHS 1256-1257 b
Measuring SMBH with NIRSpec IFU.
NIRCam with SED: Observing the Baryon Cycles at z = 1 with Legacy QSO Field.
JWST/NIRSpec Multi-Object Spectroscopy data reduction of lensed Lyman-alpha Emitters behind lensing cluster A2744
Clumpy Galaxies
Searching for proto-planets with JWST
Transmission spectroscopy of WASP-39b with JWST
Mid-infrared Spectroscopy of NGC 7469
Imaging PDS70 Protoplanetary Disk with JWST/NIRCam
Spectral analysis of NGC 7469 in the Mid-IR wavelength
Distinguish Star-Forming and Quiescent Galaxies
Detecting Cosmic Rays by Looking Data Quality (DQ) Flags
Identifying High Redshift Galaxies and its Galaxy Morphology through Unsupervised Machine Learning
The lyα emitters in the JWST UNCOVER survey
NIRCAM Imaging Of Star-forming region G11P1
Investigating MIR Spectra of Seyfert Galaxy NGC 4395 Using JWST MIRI
Lyman break galaxy
Title: NIRSpec MOS and NIRCam Grism data reduction for high redshift z > 3 galaxies.
Title: Galaxy Cluster MACS0416
Subtitle: NIRCam Data Preparation for Lens Modelling
A theoretical study on the influence of density waves on gas morphology in spiral galaxies using NIRCam imaging.
Integral Field Spectroscopy of High-redshift Lensed Quasars with JWST
Properties of massive stars from James Webb Space Telescope
NIRSpec IFUz Data Calibration and Analysis

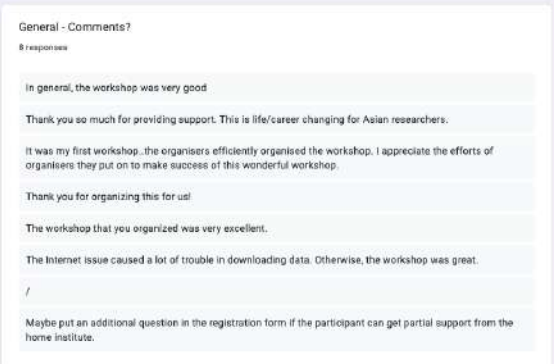
Appendix IV - Results from the evaluation form

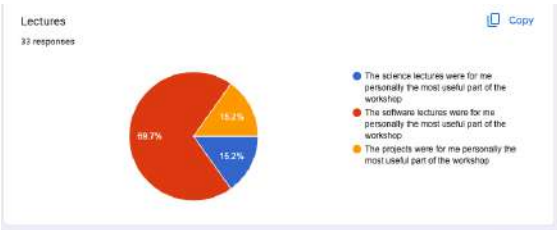


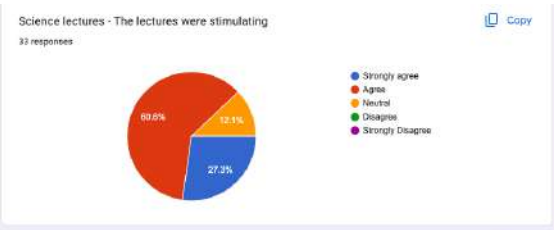


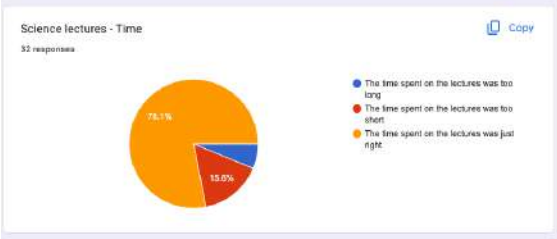


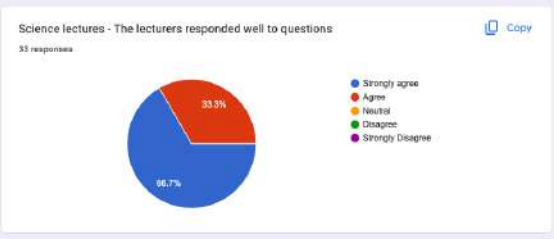


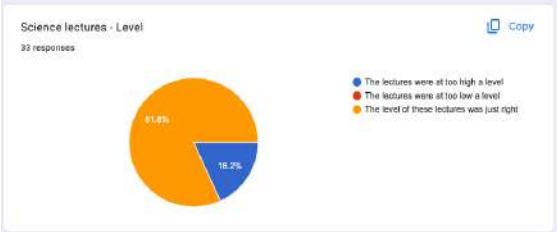


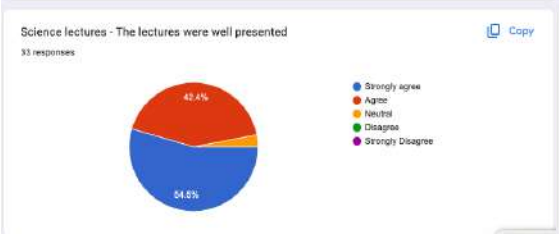


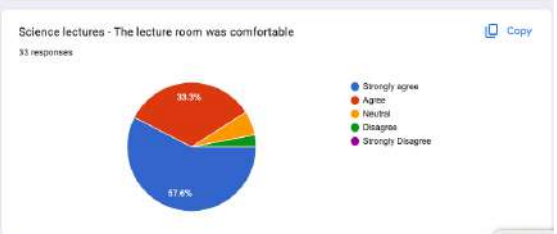


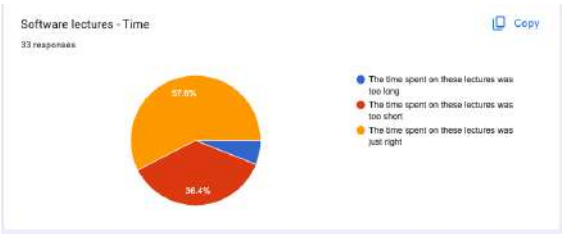


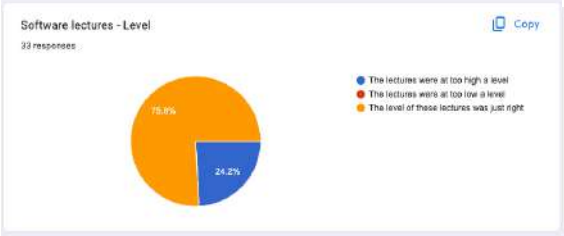


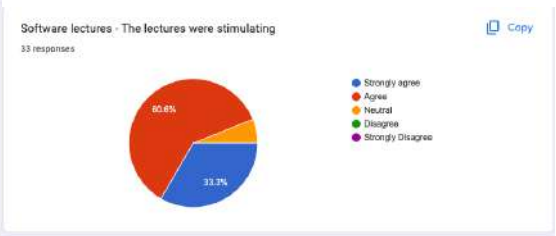


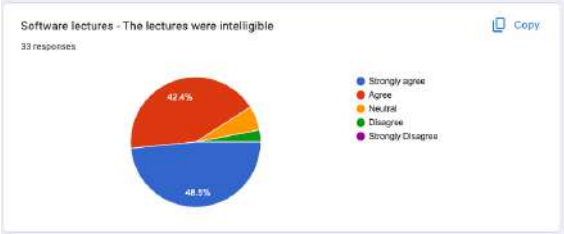


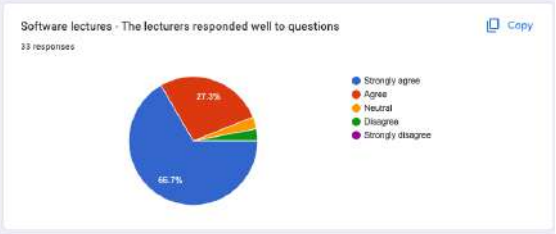


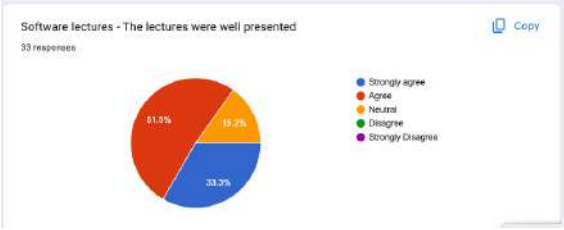


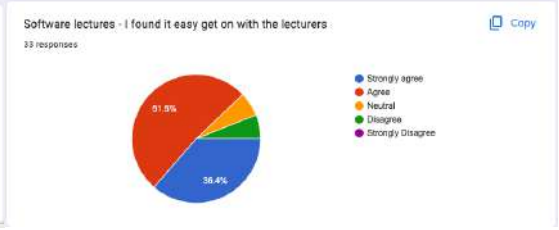


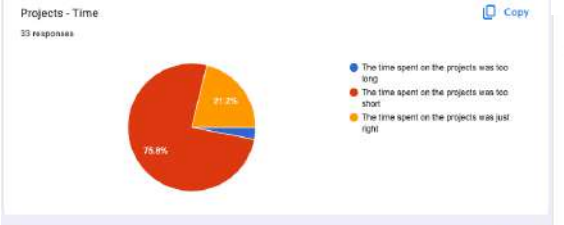


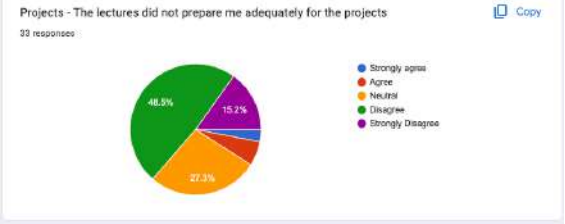


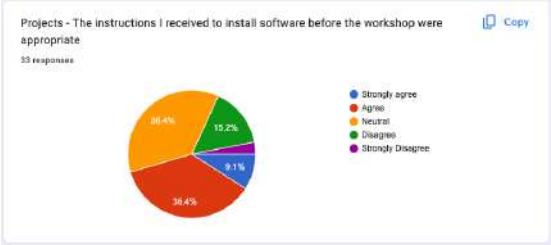


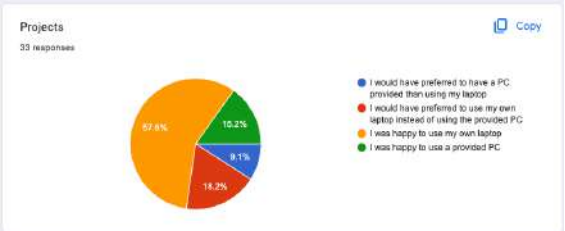


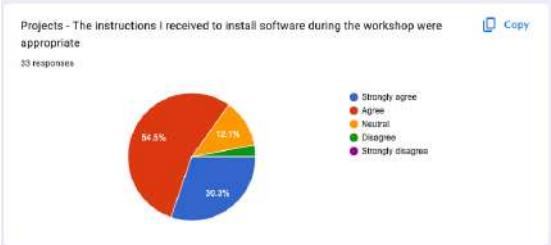


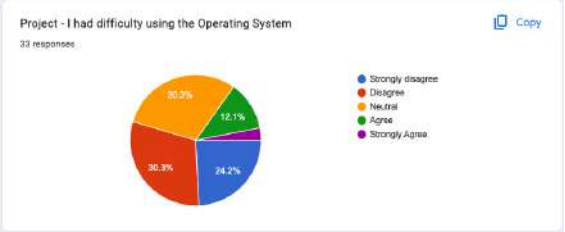












Many comments were also obtained, some of them listed (and interleaved) below, considered the most critical / interesting ones:

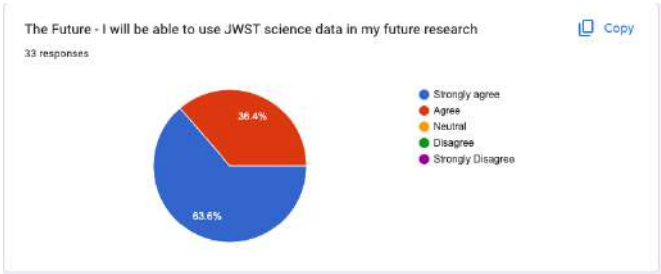
- The contents of the technical lectures including the data reduction process was less to learn the techniques for all observing mode. So they may be possibilities to extend the workshop one more week to digest the reduction steps for most of the observing mode, specially the grim/prism mode observation and coronagraphy one for me.

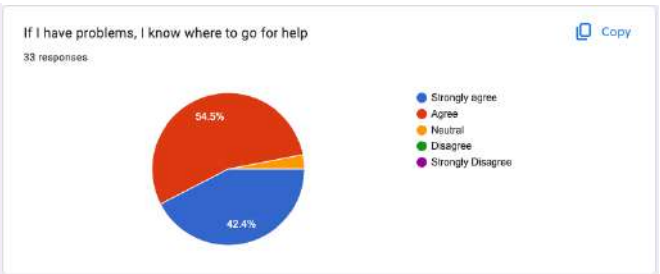
- There was some difficulty during the software lectures to try to install all the required software. It got better during the second day when we encourage people who are capable to use their own machine and reduce the load of the servers for others who need them. The clear instructions of the two methods should be presented clearly to make sure that we all understand.

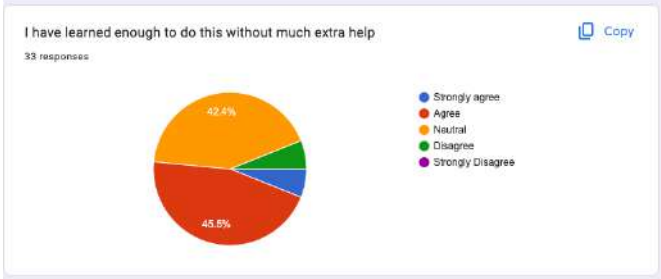
- The interactive style used, e.g., by Themiya, Isabella, and Javier when we ran the code simultaneously with the lecturers was the most efficient way for me to learn the software.

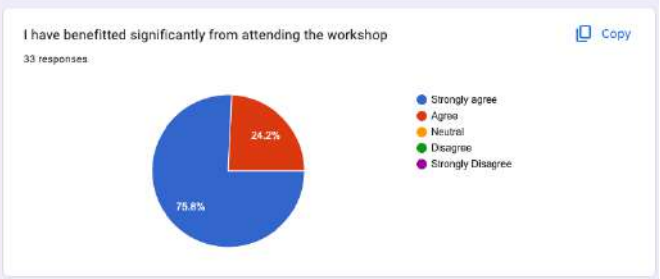
- The time for carrying out the project is too short except for mastering data reduction pipeline
- It'd be much better if we had discussed about the project with the mentors since the very beginning of the workshop.

- The RAM is too low as everyone accesses to HPC at the same time that costs a lot of memory and time to complete individual project









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

18 responses

Before joining this workshop, I had never used JWST data. The knowledge I acquired here is incredibly useful for my academic and research work. Thank you very much for giving me this opportunity to attend the workshop. I look forward to participating in more workshops and hope to be one of the resource persons at I-HOW one day.

The data should prepare in advance so that participant can download and prepare before coming to the workshop room. That will safe a huge amount of time. Current, we are waste a lot of time in downloading and waiting for the set up.

This was really great opportunity for me to learn JWST data reduction specially in MIRI IFU mode. The workshop was well organized with lovely people.

Love the workshop. I really will benefit a lot with the knowledge I got from the workshop for my future.

The workshop is excellent for participants from developing countries in many ways, including scientific topics, quality of lectures, and hands-on sessions. It would be beneficial if participants had time to present their own projects and seek advice/support from lecturers, in addition to the hands-on projects. Participants should be encouraged to speak up, and lecturers should spend more time understanding the challenges and difficulties of doing research in developing countries.

This workshop was very useful for me. This workshop also provided me with accommodations, so I don't have to worry about financial issues. Thank you so much :)

Great workshop. Please create more of the following workshops (onsite/online)

Would love to this again in a few years or so

/

I had a very good time at the workshop, learning a lot about JWST, how to exactly do the reduction, and how to start a project.

Workshop duration should be atleast 3 weeks.. the time for projects was less.

Would like more workshops like this, maybe specialized on one instrument to get really familiar with it

May be partner or peer project is also good to achieve more in the project

Appendix V – Photos

1 – Official workshop photo

2 – JDAP 2024 about to start

3 – A lecture going on

4 – Hands-on – students working on their projects

5 – Lunch time – In the first table, Nicha, local organiser with three lecturers: Isabel, Xin and Chris

6 – Mariano (IAU-organiser) and card tricks before the morning start

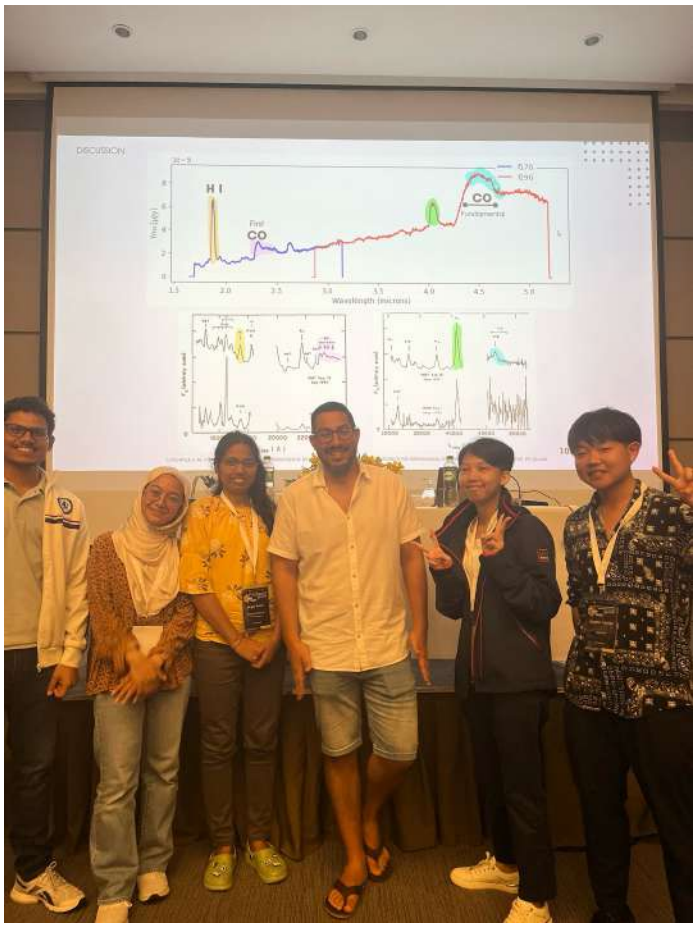
7 –Elephant sanctuary on the mid-Saturday excursion

8 – Elephant pictures, left with Carlos (COSPAR organizer). Carlos is the one with the hut

9 – A JDAP 2024 cake for the elephants… though they had to share with the buffaloes

10 – Visit to the National Radio Astronomy Observatory of Thailand

11 – Student presentations on the last workshop day



12 – Goodbyes after the Student presentations – here with Javier (CAB, in shorts)