

Mozambican Joint Exchange Development Initiative



(JEDI-Moz) Report to IAU/OAD 21th Sept - 30th Sept, 2016

(row standing): Alana Sengulane, Dário Maputo, José Fonseca, Bartolomeu Ubisse, Bruce Basset, Arrykrishna Mootoovaloo, Jordão Sáide, Penina Saul, Charlene Mito, Arlindo Mazuze, Bercaldito Mapulende
(row sitting): Teixeira Maputumane, João Mondlane, Cláudio Paulo, Francese Bacião

Mozambique lacks highly qualified astronomers and astrophysics as well as a scientific culture in the subject. To minimize these shortcomings and foster interest on the subject among young university students we organised three activities as described in the OAD proposal.

Activities:

Pre-JEDI Python workshop:



Figure: Dr. José Fonseca from UWC giving the pre-JEDI python workshop.

All the 11 JEDI participants were at the pre-JEDI python workshop as well as staff from the University Eduardo Mondlane. The workshop focused on how to write code in python and the science packages Numpy, Scipy and Matplotlib. The workshop was held in the Physics department of University Eduardo Mondlane on

the 21st and 22nd September 2016. The responses from the students was extremely positive since they have not had the opportunity to work with python before. Contacts with some of the participants have been maintained since they have shown interest in learning more about the coding language. All the resources produced where distributed by the students.

Facilitator: José Fonseca (UWC)

Participants: Alana Sengulane (UP), Arlindo Mazuze (UP), Bartolomeu Ubisse (UEM), Bercaldito Mapulende



(INAM), Charlene Mito (UP), Cláudio Paulo (UEM), Enoque Malate (UEM), Francese Bacião (UP), Genito Maura (UEM), João Mondlane (UEM), Jordão Saíde (UEM), Penina Saul (UEM), Teixeira Maputumane (UP).

Public talk:



Figure: Prof Mário Santos speaking about research opportunities with the SKA - Africa.

Figure: Audience of the public talk.

The public talk of Mário Santos counted with the presence of around 50 undergrad students of University Eduardo Mondlane. It focused on Astronomy and Astrophysics and the important role the SKA will have in uplifting science in Africa as a whole. The public talk was held on the 23rd September in the Department of Physics of University Eduardo Mondlane.

JEDI - MZ

1. Country of workshop: Mozambique

2. City/Location: Praia do Bilene - Tenda Tora

3. Dates of workshop, duration of workshop: 26 September 2016 - 30 September 2016

4. University / universities represented at workshop:

Facilitators:

University of Cape Town (UCT)

University Eduardo Mondlane (UEM)

University of the Western Cape (UWC)

Students additionally:

University Eduardo Mondlane

Pedagogic University

5. Facilitator name(s) and contact details

Prof. Bassett, Bruce A.: bruce.a.bassett@gmail.com
Dr. Fonseca, José: josecarlos.s.fonseca@gmail.com
Mr. Mootoovaloo , Arrykrishna: arrykrish@gmail.com
Mr. Paulo, Cláudio: claudiompaulo@gmail.com

6. Number of participants:

11 students plus 4 facilitators

7. Participant type

1 - National Institute of Meteorology (INAM)
4 - Academic staff (1 UP and 1 from UEM)
1 - Msc NASSP
7 - Undergrad students of Physics, Geography and Computer Science

8. Participant and Facilitator details:

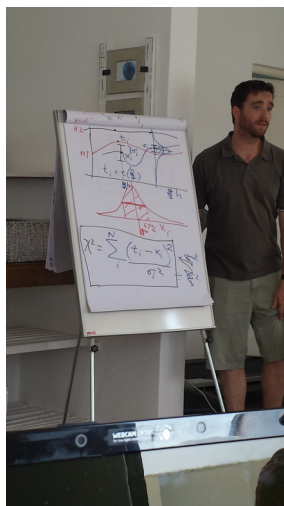
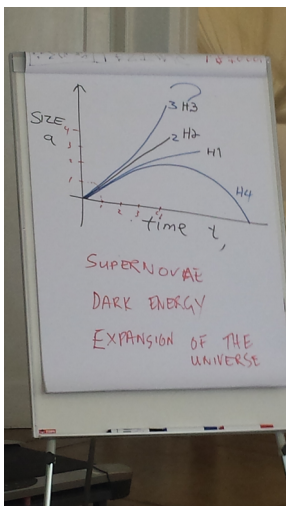
First Name	Surname	Institution	Country
Alana	Sengulane	UP	Mozambique
Arrykrishna	Mootoovaloo	AIMS/UCT	Mauritius/South Africa
Arlindo	Mazuze	UP	Mozambique
Bartolomeu	Ubisse	UEM	Mozambique
Bercaldito	Mapulende	INAM	Mozambique
Bruce	Bassett	AIMS/SAAO/UCT (SA co-PI)	South Africa
Charlene	Mito	UP	Mozambique
Cláudio	Paulo	UEM	Mozambique/South Africa
Dário	Maputo		Mozambique
Francese	Bacião	UEM	Mozambique
João	Mondlane	UP	Mozambique
Jordão	Saíde	UEM	Mozambique
José	Fonseca	UWC	Portugal/South Africa
Penina	Saul	UEM	Mozambique
Teixeira	Maputumane	UP	Mozambique

Keys:

- AIMS - African Institute for Mathematical Sciences
- SAAO - South African Astronomical Observatory
- UCT - University of Cape Town
- UEM - University Eduardo Mondlane
- UWC - University of the Western Cape
- UP - Universidade Pedagógica

9. Projects develops and shortcomings:

Although most of JEDI projects have a research component, soon we realised that JEDI-Mz could not have a high component in research. Instead we develop an Astronomy project so that they could improve their skills in coding, Scientific Method, research and communication. The project/tutorial consisted on using Supernova Type Ia data to fit the



cosmological parameters using Chi-square and MCMC. They worked in groups and all

broadly finished the proposed projects. We also encouraged them to independently look for material and have a critical opinion about it.

Figure: Pictures of work during the JEDI.



Figure: Participants working (top). Penina presenting her group results (Middle). Group meeting (bottom).

10. Outcome

Although it is very early to access the real impact of the JEDI, two of the participants have expressed interest on progressing their careers in Astronomy and Astrophysics. They already started inquires about NASSP at UCT and masters at AIMS.

11. Self-evaluation

The JEDI was planned for participants with a higher proficiency in english as well as a better level in mathematics. We may have been too hopeful on the development of the projects for the JEDI. Future activities in Mozambique require a better selection of the participants as well as specific time allocation to solely fill the gaps that participants may have. Despite these, the impact of JEDI in the participants at a personal level made it worth it. They have shown a high level of engagement which made the job of the facilitators simpler, since it was easy to identify the gaps which we had to fill so that they could proceed. In the case of Mozambique a week of JEDI is not enough, except if more prior training is given.

Full financial report (to be attached)

- a. Please find herewith attached the financial report;
- b. There is a balance of 43442,11 MZN that is left over and the team request that the money be used to fund any of the Mozambican participants to attend future JEDI workshops in South Africa as well as to organize further outreach activities in Mozambique.

Workshop Participant Survey:

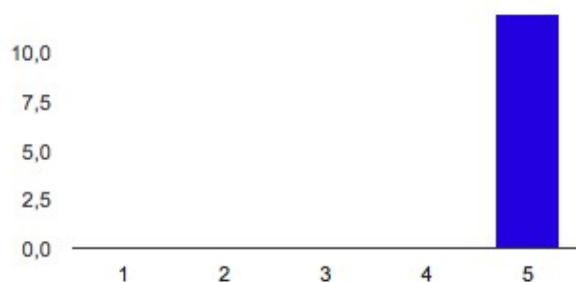
An online forms was created and the participants were asked to give their feedback about the workshop. The answers to the questionnaire are available in:

https://docs.google.com/forms/d/16uX7PMUQBtP_gAUHAq0W3WXDoyNpYIEk2oLvziFAoY8/viewanalytics#responses

The findings from google analytics are shown below:

Responses range from 1 (strongly disagree) to 5 (strongly agree).

Os tutores demonstraram ter conhecimentos em Python.

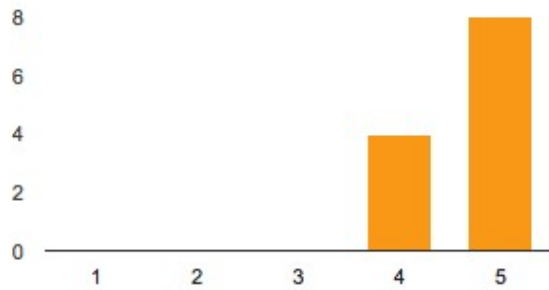


Discordo profundamente:	1	0	0%
	2	0	0%
	3	0	0%
	4	0	0%
Concordo absolutamente:	5	12	100%

-Python Workshop

>The tutors demonstrated thorough knowledge of Python.

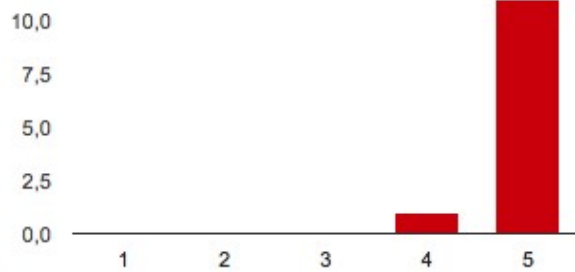
Os tutores apresentaram o curso de forma bem estruturada.



Discordo profundamente:	1	0	0%
	2	0	0%
	3	0	0%
	4	4	33.3%
Concordo absolutamente:	5	8	66.7%

>The tutors presented the course in a well structured way.

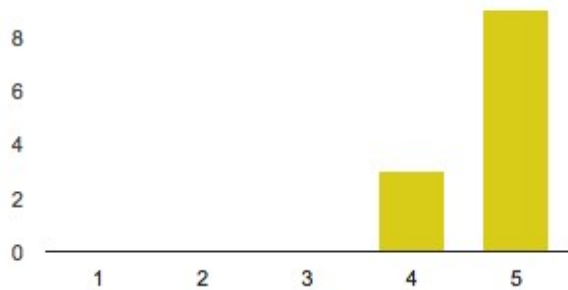
Os tutores estavam bem preparados para as aulas.



Discordo profundamente:	1	0	0%
	2	0	0%
	3	0	0%
	4	1	8.3%
Concordo absolutamente:	5	11	91.7%

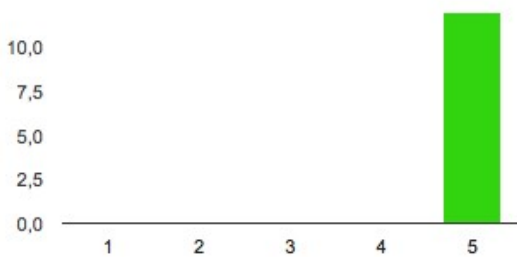
>The tutors were well prepared for the workshop.

Os tutores explicaram bem os conceitos.



Discordo profundamente:	1	0	0%
	2	0	0%
	3	0	0%
	4	3	25%
Concordo absolutamente:	5	9	75%

Os tutores criaram um bom ambiente onde os participantes podiam fazer perguntas sem se sentirem intimidados.

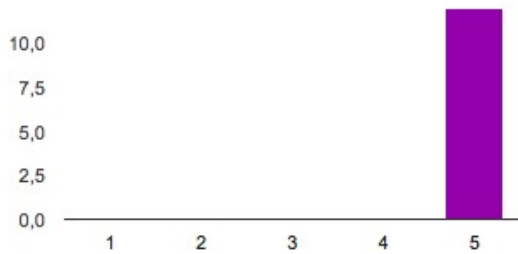


Discordo profundamente:	1	0	0%
	2	0	0%
	3	0	0%
	4	0	0%
Concordo absolutamente:	5	12	100%

>The tutors explained well the concepts.

>The tutors created a good environment where the participants could make any question without feeling intimidated.

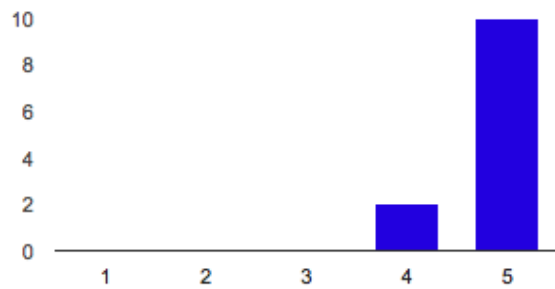
Os tutores trataram os participantes com o respeito e dignidade.



Discordo profundamente:	1	0	0%
	2	0	0%
	3	0	0%
	4	0	0%
Concordo absolutamente:	5	12	100%

>The tutors were respectful with the participants.

Os tutores demonstraram ter conhecimentos em Astronomia e Astrofísica.

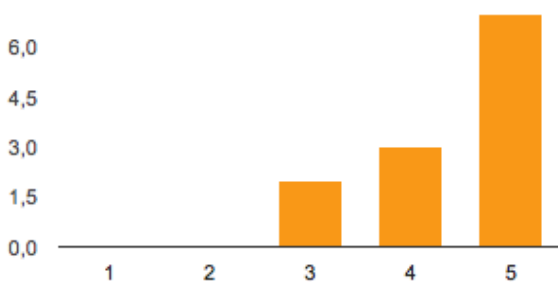


Discordo profundamente:	1	0	0%
	2	0	0%
	3	0	0%
	4	2	16.7%
Concordo absolutamente:	5	10	83.3%

- JEDI in Bilene

The tutors demonstrated thorough knowledge in Astronomy and Astrophysics.

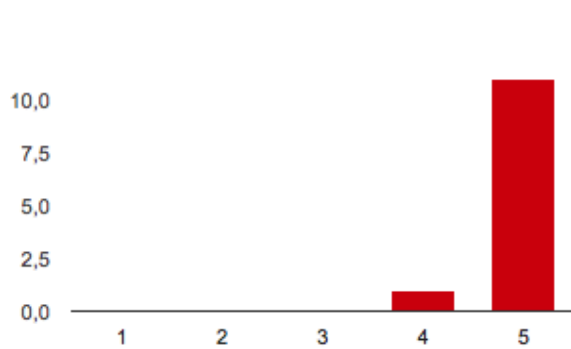
Os tutores apresentaram os projetos de forma bem estruturada.



Discordo profundamente:	1	0	0%
	2	0	0%
	3	2	16.7%
	4	3	25%
Concordo absolutamente:	5	7	58.3%

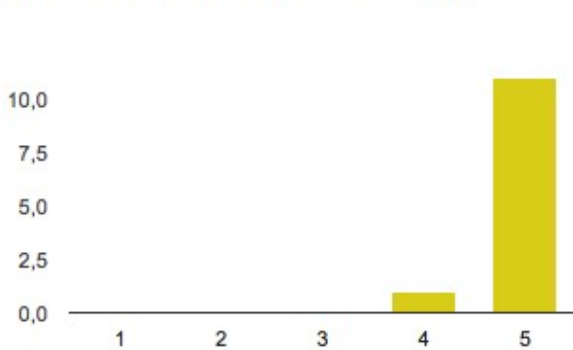
The tutors presented the project in a well structured way.

Os tutores estavam bem preparados para os projectos desenvolvidos no JEDI.



Discordo profundamente:	1	0	0%
	2	0	0%
	3	0	0%
	4	1	8.3%
Concordo absolutamente:	5	11	91.7%

Os tutores explicaram bem os conceitos.



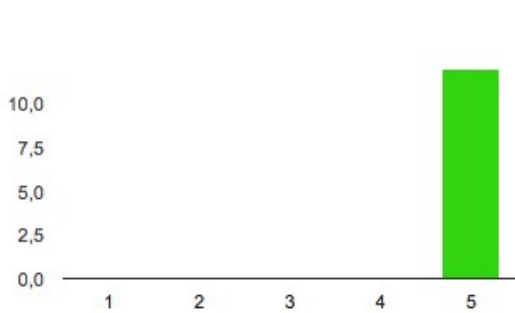
Discordo profundamente:	1	0	0%
	2	0	0%
	3	0	0%
	4	1	8.3%
Concordo absolutamente:	5	11	91.7%

>The tutors were well prepared for the JEDI projects.

>The tutors explained properly all concepts needed.

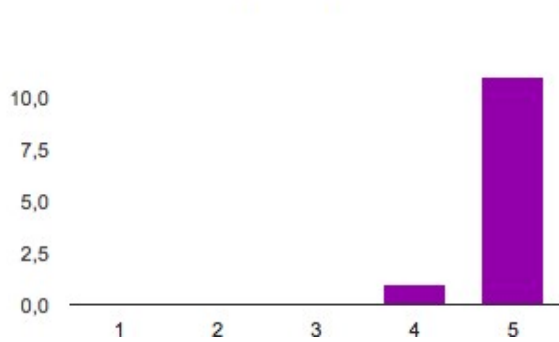
>The tutors created a good environment where the participants could make any question without feeling intimidated.

Os tutores criaram um bom ambiente onde os participantes podiam fazer perguntas sem se sentirem intimidados.



Discordo profundamente:	1	0	0%
	2	0	0%
	3	0	0%
	4	0	0%
Concordo absolutamente:	5	12	100%

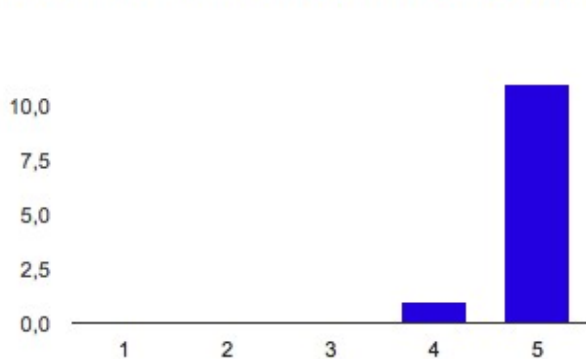
Os tutores trataram os participantes com o respeito e dignidade.



Discordo profundamente:	1	0	0%
	2	0	0%
	3	0	0%
	4	1	8.3%
Concordo absolutamente:	5	11	91.7%

>The tutors were respectful with the participants.

Quero aprender mais Astronomia e Astrofísica.

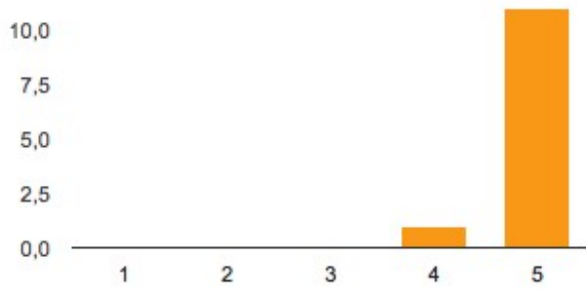


Discordo profundamente:	1	0	0%
	2	0	0%
	3	0	0%
	4	1	8.3%
Concordo absolutamente:	5	11	91.7%

- General questionnaire

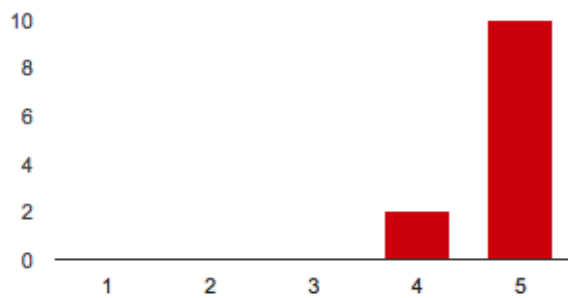
>I want to learn more Astronomy and Astrophysics.

A Astronomia é importante no nosso dia-a-dia.



Discordo profundamente:	1	0	0%
	2	0	0%
	3	0	0%
	4	1	8.3%
Concordo absolutamente:	5	11	91.7%

Participar neste workshop motivou-me para estudar Astronomia e Astrofísica no futuro.

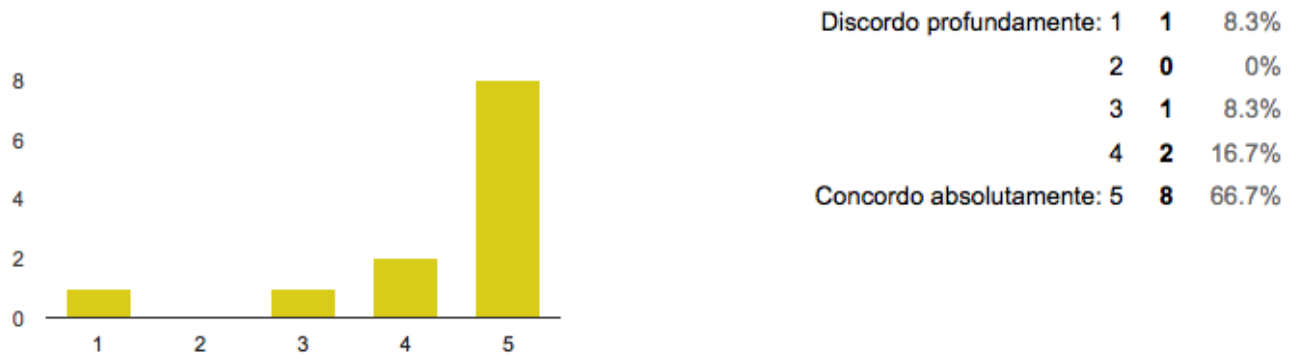


Discordo profundamente:	1	0	0%
	2	0	0%
	3	0	0%
	4	2	16.7%
Concordo absolutamente:	5	10	83.3%

>Astronomy is important in our day-to-day life.

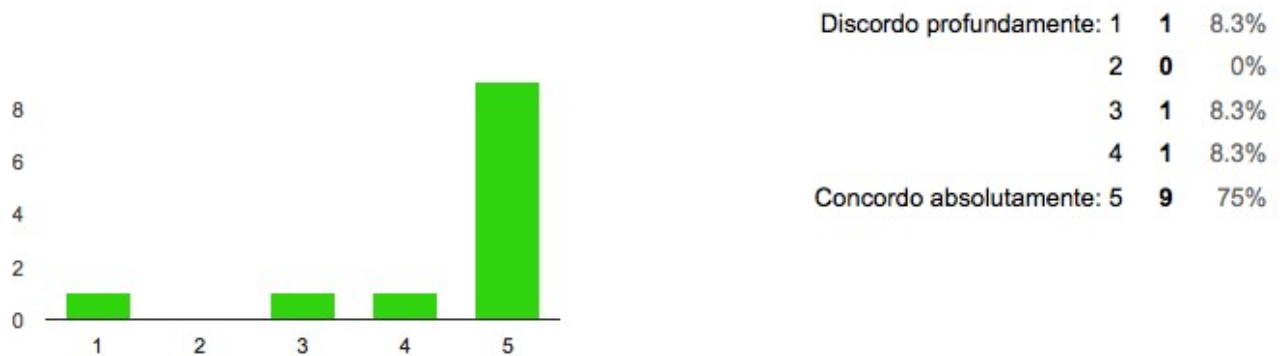
>Participation in this workshop motivated me to learn more Astronomy and Astrophysics in the future.

Participar neste workshop motivou-me para estudar Física e Matemática no futuro.



>Participation in this workshop motivated me to learn more Physics and Mathematics in the future.

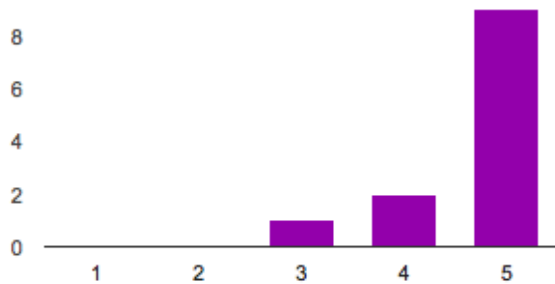
Participar neste workshop mudou a minha opinião sobre quão importante Física é.



>Participating in this workshop changed my opinion about the importance of Physics.

>Participating in this workshop changed the way I perceive reality.

Participar neste workshop mudou a minha forma de pensar sobre a realidade que nos rodeia.



Discordo profundamente:	1	0	0%
	2	0	0%
	3	1	8.3%
	4	2	16.7%
Concordo absolutamente:	5	9	75%

Further feedback from participants:

As a reply to the question: "What did you like more?"

"De como os aspectos inerentes à Ciência no seu todo foram abordados, de como é feita a investigação, e não só, de como a Astrofísica é importante para explicar muitos fenómenos ao nosso redor. Foi brilhante como vocês nos fizeram sentir à vontade e nos faziam pensar cientificamente. Nos faziam buscar os conceitos e nos faziam formular as ideias e pensamentos. A convivência no seu todo, não havia separação, todos nós sentíamos-nos envolvidos a pensar, discutir, trabalhar, conviver e partilhar. Duma forma resumida gostei de como vocês nos fizeram sentir como uma família de cientistas com um único objectivo de mudar a maneira de como nós víamos as coisas."

English translation:

How the inherent aspects of Science as a whole were addressed, how the investigation is done, not only that but also, how Astrophysics is important to explain many phenomena around us. It was brilliant how you made us feel at ease and made us think scientifically. They made us seek the concepts and made us formulate ideas and thoughts. The coexistence as a whole, there was no separation, we all felt that we belonged when thinking, discussing, working, living and sharing. In a nutshell, I liked how you made us feel like a family of scientists with a single goal of changing the way we looked at things.

Concluding remarks

The JEDI-Mz organising committee strongly feels that this workshop had a positive outcome. We would like to thank the IAU/OAD, SKA-A, UEM, UP and everyone who have made this project a success.