Report from the event supported by RadioNet

TITLE	*ALMA DATA PROCESSING WORKSHOP*
DATE:	*5-7 DECEMBER 2017*
LOCATION:	*LISBON (PORTUGAL)*
MEETING WEBPAGE:	*HTTP://WWW.IASTRO.PT/RESEARCH/CONFERENCES/ALMA2017/*
HOST INSTITUTE:	*PORTUGUESE ALMA CENTRE OF EXPERTISE (IA-FCUL)*
RADIONET BENEFICIARY / NO:	*TO BE FILLED BY MANAGEMENT*

Report:

1. SCIENTIFIC SUMMARY

The huge increase of data available within the ALMA archive, has improved enormously the possibility for the scientific community to exploit the potentials of this facility. The number of publications per year since the Cycle 0 is growing constantly, at a rate comparable to others well known telescopes, such as the VLT at ESO, as shown in Fig. 1.
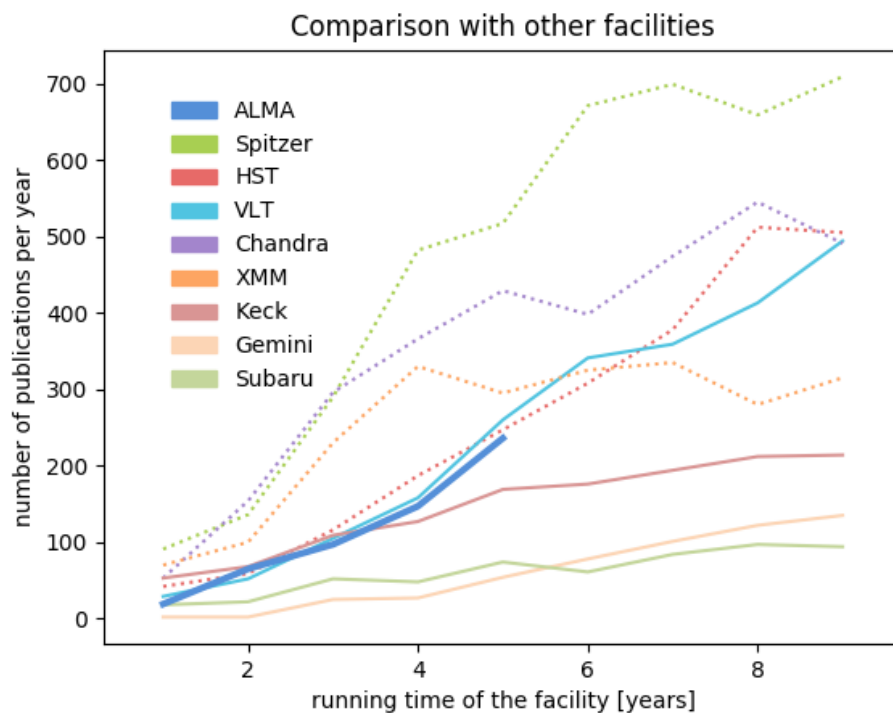

Fig. 1: Number of publications per year since the running time of the facility (Credits: Felix Stoehr, ESO)

More than 70% of the data has been publicly downloaded, and the publication related to the archival data increased from 9% on June 2015 up to 14% on September 2016. This, joint to new radio facilities under construction all over the world, such as MeerKat, ASKAP, and JVLA, suggests a promising future for the investigation of this part of the electromagnetic spectrum, and in particular then for the interferometric community.

However, there are still many issues related to the non-friendly nature of interferometric data, which need different processes to be transformed in scientific useful data. This, in some way, hamper a full exploitation of the enormous potential of the ALMA database, with still wide space for fruitful investigations for many researchers. For these reasons, the Portuguese ALMA CENTER of Expertise (PACE) on behalf of the Institute of Astronomy and Space Sciences, in collaboration with the ESO, organized an "ALMA Data Processing Workshop" held in Lisbon on 5th, 6th, and 7th of December (website: http://www.iastro.pt/research/conferences/alma2017/).

The goal of the workshop was to bring together all the community which were planning to use ALMA data in the future, and join them together for different hands-on sessions. The organizers, together with expert

invited speakers from the ARC nodes of UK and Netherlands, guided the participants from raw to reduced data, in two days and half of full work. Moreover, we included the possibility for researchers with their own data, to ask support and interactively reduce their data, increasing in this way the impact of the workshop for their science.

The workshop environment was very informal, with a large fraction of time devoted to discussion, analysis, examples, and disclosure of tips and/or suggestions to solve different problems.

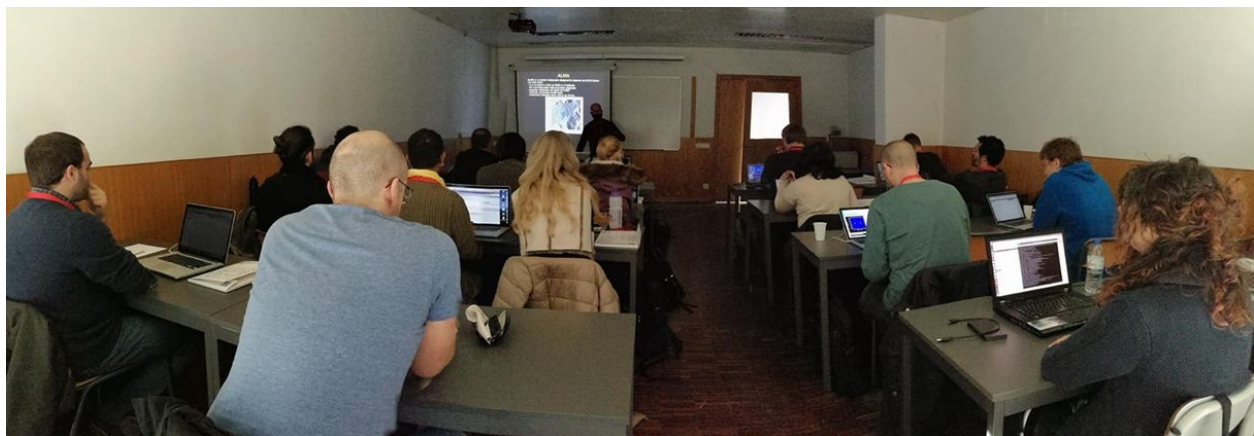
Fig. 2 – Ciro Pappalardo in the opening session

Fig. 3- Panomaric View of the workshop

After the two and half day, during the wrap-up session, we discussed the problems related to each single case, and we summarize the main steps performed during the workshop. The participants, with an high fraction of beginners, were able to complete the processes and extract fits file images from the raw data we gave them on the first day. Obviously this is only a starting point, but we believe that the examples chosen by the SOC of the workshop covered important issues related to the data analysis, and surely will help them in their future studies.

2. AGENDA OF THE EVENT

The speakers of the event were:
1 – Ciro Pappalardo (Lead Scientist of the Portuguese ALMA Center of Expertise)
2 – George Bendo (Invited speaker from the UK ARC node)
3 – Ciriaco Goddi (Invited speaker from the Netherlands ARC node)
The workshop program is attached below:

5th December - afternoon session

13:30 - 14:00	Logistics - Welcome
14:00 - 15:00	Introduction to interferometry
15:00 - 15:30	Coffee Break
15:30 - 16:00	Introduction to ALMA + Alma Observing Tool
16:00 - 16:30	Introduction to VLBI
16:30 - 17:00	ALMA Scientific Case I: How it was done: An explanatory Science case

6th December

09:30 - 10:00	ALMA Scientific Case II - How it was done: An explanatory Science case
10:00 - 10:45	Hands-on Session: Calibration
10:45 - 11:15	Coffee Break
11:15 - 12:30	Hands-on Session: Calibration
12:30 - 13:30	Lunch
13:30 - 15:00	Hands-on Session: Calibration
15:00 - 15:30	Coffee Break
15:30 - 17:00	Hands-on Session: Calibration

7th December

09:30 - 10:00	Wrap-up of calibration session
10:00 - 10:45	Imaging Principles
10:45 - 11:15	Coffee Break
11:15 - 12:30	Hands-on Session: Imaging
12:30 - 13:30	Lunch
13:30 - 15:00	Hands-on Session: Imaging
15:00 - 15:30	Coffee Break
15:30 - 16.30	Hands-on Session: Imaging
16:30 - 17:00	Wrap-up of the workshop

3. PARTICIPANTS

A total of 19 astronomers attended the workshop, coming from ten different countries: Pakistan, Greece, Turkey, Croatia, Netherlands, Ireland, Italy, UK, Spain, and of course Portugal. As expected, the most represented communities were Portugal and Spain, for logistics reasons. 37% of the participants were female, and more than half of the participants were PhD or Master students.

Beyond the participants, the organizers invited two expert speakers from the ARC node of the UK, Dr. George Bendo, and from Netherlands, Dr. Ciriaco Goddi, which work as ALMA data analysts in their respective ALMA nodes.

An important aspect to underline is that almost 63% of the participants were not experts in interferometry, and approached the topic for the first time. This is very positive, as the main goals of the workshop was exactly to attract young scientists towards the use of interferometric data.

List of supported tutors:
- George Bendo (UK Arc Node)
- Ciriaco Goddi (Netherlands Arc Node)

List of supported participants:
- William Person (SRON – Phd Student from UK)
- Michele Ginolfi (INAF-Rome – PhD Student from Italy)
- David Glass (UCLAN – PhD Student from UK)
- Jaime Avalos (Leipzig Univ./Universidad de Concepcion - Master Student from Spain)
- Nikki Zabel (Cardiff University – PhD Student from Netherlands)

Below the list of participants with their signature and nationality:

ALMA Data Processing workshop
RadioNet funded workshop helping the ALMA users community
05-07 December 2017, FCUL, Lisboa, Portugal

Name	Surname	Affiliation	Position	Nationality	Signature
Aonghus	Mullins	Max Planck Institute for Extraterrestrial Physics, Garching	POSTDOC	IRISH	
Basmah	Riaz	MPE	Postdoc	Pakistani	
David	Glass	University of Central Lancashire, UK	PhD	UK	
Emmanuel	Caux	IRAP-CNRS/UPS Toulouse, France			
Gale-Sides	Kingsley	University of Cambridge	Post Doc	British	
Iris	Breda	IA-Porto	PhD student	Pt	TBreda
Israel	Matute	IA-Lisbon	Postdoc	Spanish	
Jaime	Avalos	Leipzig University / Universidad de Concepcion	Master Student	Spanish	
Jean Michel	Gomes	IA-Porto			
Josep	Marti	Universidad de Jaen	PROFESSOR	SPAIN	
Koraljka	Muzic	CENTRA/FCUL	Postdoc	CROATIA	
Loretta	Dunne	Cardiff University			
Maciej	Koprowski	University of Hertfordshire			
Michele	Ginolfi	INAF-Rome	PhD student	IT	
Nanda	Kumar	IA-Porto	Principal Investigator	Portuguese	
Nikki	Zabel	Cardiff University	PhD Student	Dutch	Zabel
Pedro	Palmeirim	IA-Porto	Post Doc	Portugal	
Polychronis	Papaderos	Instituto de Astrofísica e Ciências do Espaço			
SARA	PEREZ SANCHEZ	IAstro-University of Lisbon	PhD Student	SPANISH	
Sheona	Urquhart	The Open University, UK	Faculty	UK	
Silvio	Lorenzoni	IA-Lisbon			
Sim	Brownson	University of Cambridge	PhD Student	British	
Stergios	Amarantidis	Institute of Astrophysics and Space Sciences, Lisbon	PhD Student	Greece	
Sümeyye	Suri	University of Cologne	PhD Student	Turkish	
William	Pearson	SRON	PhD Student	UK	

http://www.iastro.pt/research/conferences/alma2017/

Fig. 4 - Partecipants list

4. RADIONET FINANCIAL CONTRIBUTION

We used RadioNet support to pay the full stay of two invited speakers, which helped to manage the hands-on sessions, and we offered a fellow for the accommodation to 5 young PhD students from Germany, UK, and Italy. With the available support we also paid the costs relate to the event, such as the coffee-breaks and the hall-rent.
Below the list of supported participants:

Sheet1

Name	Surname	Institution	Nationality	Reasons for the support
George	Bendo	UK-ARC node	USA	Invited speaker – UK ARC Node
Ciriaco	Goddi	NL-ARC node	Italy	Invited speaker – NL ARC Node
William	Pearson	SRON(NL)	UK	Participants
Michele	Ginolfi	INAF-Rome	Italy	Participants
David	Glass	UCLAN(UK)	UK	Participants
Jaime	Avalos	Leipzig University / Universidad de Concepcion	Spain	Participants
Nikki	Zabel	Cardiff University	Netherlands	Participants

Fig. 5 – List of supported people

5. PUBLICATIONS

The presentations and some pictures of the workshop are posted on the web site:

http://www.iastro.pt/research/conferences/alma2017/