

BoF 01: Education and public outreach in the era of Big Data science

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Astronomical data are a very valuable resource for education and public outreach (EPO), especially in the era of Internet and Cloud Computing.

- What is the value of astronomy data in EPO?
- What are advantages and benefits of data driven EPO?
- What are best practices of data driven EPO?
- What are challenges facing data driven EPO?
- How to present astronomy to general public and schools with new technologies (es. VR)?
- There is the need for new software services and/or computing services for EPO uses?

- Curriculums and EPO-ready resources
- Best practices

Brief talks:

- Markus Demleitner: Updating GAVO's ADQL course to language version 2.1
- Marco Molinaro: Trieste NEXT Science Festival

IAUS 367

BoF 2: Data Formats

There were over 30 people in attendance; Jessica Mink chaired, Rosa Diaz scribed.

IAU Astronomical Data Representation Working Group

- Jessica Mink is chair; she and Rosa Diaz will start putting together a committee to talk about structured data formats
- We recommended to the IAU FITS SEG that arbitrary-length keywords be added to the FITS standard soon.
- Pierre Fernique (CDS) brought up problems dealing with compressed FITS images. Most compression formats are supported only by CFITSIO. This is an archival problem. Tim Jenness noted that LSST is getting 5x compression, which is making storage feasible. Jessica suggested that always be archived uncompressed for permanent access.
- Laurent Michel and Mireille Louys (Strasbourg Observatory) suggested that VO tags should be added to FITS files to facilitate publishing in VO collections and show provenance.
- Gilles Landais from CDS invited authors to better use spectra and image FITS standards.

BoF: How to escape from the Herd of White Elephants



- The roles and interactions of Users, Developers and Managers (see the paper)
- This attracted a surprisingly large crowd of more than 50 people
 - Just like the FADS sessions of yore
- It points to a *deep yearning* to hold forth
- So let's take a vote ...
 - ...to make this a yearly event again

ADASS2019 BoF#4:

*Forming a global network for communication between
astronomical observatories*

tinyurl.com/adass-bof4

Chair: Vanessa Moss



Thank you to all who attended

- Especially **speakers**: Rosly Renil/Gyula Jozsa(**MeerKAT**), Betsey Adams/Leon Oostrum/Manu Orru (**Apertif**), Roberto Pizzo (**LOFAR**), Mark Wieringa (**ATCA**), Benjamin Winkel (**Effelsberg**), Aidan Hotan (**ASKAP**), Thomas Boch (**VO-CDS**), Mark Taylor (**VO-IVOA**), Raffaele D'Abrusco (**Chandra**) and Luca Rizzi (**Keck**)
- *apologies for the telescopes/facilities not represented, there are many!*
- Thanks also to those who contributed **questions/comments** from the audience
- hopefully this is the beginning of some more discussion to come!



Key points raised

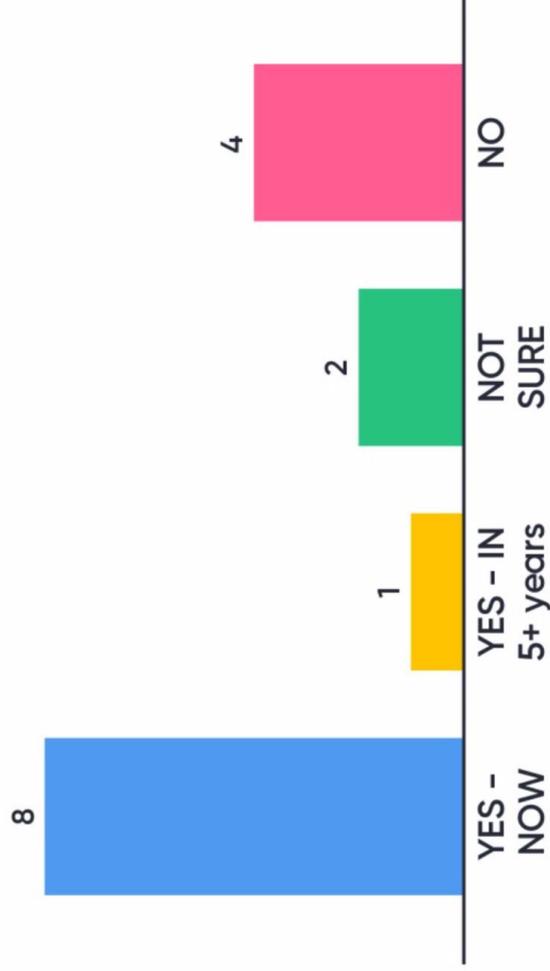
- **Successes:** nice modern tools built, good overviews, "busy weeks" to focus on solving problems, paradigm shifts in operations, institutes which bring together researchers/developers/engineers etc, building expertise in community through hands-on experience, well-designed user interfaces translating to easy use of telescopes, flexible instruments, effectiveness of pilot surveys, mixed composition teams (astronomers/developers/data stewards), service validators, projects which operate long beyond their expected time, high scientific productivity on a budget, access to data via archives
- **Challenges:** transitioning commissioning to operations, debugging complex systems, lots of in-house solutions, going operational before ready (and paying the price), dependency on experts/critical people, remote observing, training observers, persistence of old (working) software, spectrum management, optimisation of scheduling, learning to operate in service modes, 24/7 online systems, size and complexity of data + data standards, lack of support for critical services (VO), reduction in resources, changing landscapes for funding, non co-located people, cross-disciplinary interaction

Let's keep the conversation going

- **Here at ADASS:** find any of the speakers/attendees and talk to them about challenges you might have in common (quite a few)
- **After ADASS:** plan to host a discussion based on the points raised at the BoF and figure out a way to keep people connected (maintaining critical mass)
- **Ideas:** Slack for "daily" or focused communication, perhaps a **fortmonthly** telecom where each month we highlight a telescope, other ideas??

tinyurl.com/adass-bof4

Do you need/want accelerators in your daily work?



What is missing in the current accelerator landscape?

nothing
software developers
uniform language
high level libraries
wide standards
good profiler
support
maturity

What does hardware acceleration mean to you?

magic **gpu** do stupid things faster
vital
energy efficient
a is f over m

nvm

fpga

Insights

- Missing standards and uniform language => flexibility
 - OpenCL is dead
- Centralisation of accelerators (e.g. supercompute centres) leads to cost reduction
 - Supporting 2 types of CPUs cost 4 times as much as supporting 1 type
- Network bandwidth is increasing and can support significant data movement but from an energy and sustainability perspective it should still be minimized as much as possible, and would likely only work between data centres and not at end-users institutes
 - This only works with co-optimized storage arrays

Bof B.6 Teaching our students Astro Computing (~30 participants) vogelaar@astro.rug.nl, teuben@astro.umd.edu

- **Definitions**
 - **Astro computing:** Know how to use a computing device to solve astrophysical problems
 - **Teaching Astro Computing:** Teaching students knowledge and skills to support their practicals and introduce them to astronomical data science
- **Curriculum**
 - Given the amount of data related astronomy projects we should include an Astro Computing course already at undergraduate level
 - Given the amount of references to Python at ADASS conferences, it seems reasonable for a long time now to include Python in an Astro Computing course
 - To stay close to astronomical practice, an astronomer should teach and/or develop it (but not all agreed with this)
 - Difficult to get a custom made Astro Computing course in the curriculum
 - We could benefit from a public repository of Jupyter notebooks
 - This would facilitate teachers to compose a course that suits the institute's requirements
 - learn.astropy.org could be a starting point.

Building Balanced Teams summary

<http://j.mp/adass-2019-teams-bof>



- Look for exclusive behaviours and try to minimise them. This might include exclusion based on:

Gender	LGBTI+	Race	Religion
Culture	Education/Qualifications	Programming language preference	Social drinking preference
- Be mindful of our privilege and ensure that we don't miss actions impacting others
- Focus on **belonging** rather than productivity
- Accept and celebrate differences – give people the opportunity to shine!
- Create an anonymous way to provide feedback
- Ensure that meeting and work outcomes are inclusive rather than exclusive

- Web
- Data Centre

Application Oriented

- Project Oriented**
- Project data
- Project SW

- User first
- User SW

User Oriented

Interoperability
Sustainability

AAI Cloud
Standards

HPC

Data Discovery

Public Clouds

Software Discovery

Data Proximity



BoF 9: Future Governance of the ASCL

Current structure, Advisory Committee, & support & funding

Should ASCL governance change? If so, how?

Bus factor

Spreading the work

Funding

Allowing everyone to be heard

Making more people aware of ASCL