

ASTERICS Policy Forum (APF)

Guidelines for the 'Science Case' working groups

Denis Mourard, Saskia Matheussen July 2017

I Rationale

The rationale of Asterics is to address cross-cutting synergies and common challenges shared by astronomy ESFRI facilities and its major objectives are to support and accelerate the implementation of the ESFRI telescopes, to enhance their performance beyond the current state-of-the-art, and to see them interoperate as an integrated, multi-wavelength (MW) and multi-messenger (MM) facility. ASTRONET, as a consortium of national funding agencies, is dedicated to the coordination of European astronomy. The strategic objectives are to develop and update common long-term strategies (Science Vision and Infrastructure Roadmap) and to implement, in close collaborations with the different actors, the recommendations of these visions.

The goal of the policy forum is to study how to harmonize joint and efficient scheduling, operation and interoperability of the various MW/MM telescopes. This global question will be addressed through 4 main strategic topics: 1/ Joint time allocation, 2/ observing strategies for MM campaigns, 3/ data access and sharing, and 4/ general policies of common interest (towards next generation ESFRI RI). The study is based on the four ESFRI RI involved in ASTERICS (CTA, E-ELT, KM3NET and SKA == 4RI) but will also involve many other European astronomical facilities. Two workshops will be organized (~end of 2017, ~end of 2018, dates to be decided soon).

II Initial organization

To prepare this study, we consider an initial step (from now to ~October 2017) during which the 4RI are invited to provide their own vision of this question through a specific and well-representative science case analysis. Messages have been sent two months ago to the project scientists of the four RI:

- CTA: Jim HINTON (CTA Project Scientist), Ulrich STRAUMANN (CTA Managing director). After iterations, the CTA actions for the APF will be coordinated by **René ONG**.
- ELT: Michele CIRASUOLO (ELT Programme Scientist), Giuseppe BONO (Chair of the Project Science Team) and Paolo PADOVANI (ELT Science Office). The coordinator of this action will be **Michele CIRASUOLO**.
- KM3NET: Rosa CONIGLIONE (ARCA Science Coordination), Antoine KOUCHNER (ORCA Science Coordination) and Mauro TAIUTI (KM3NET spokesperson). **Mauro TAIUTI** will be the official contact person.
- SKA: Richard BRAUN (SKA Project Scientist) and Phil DIAMOND (SKA Director). **Richard BRAUN** will be the official contact person.

III Science cases

In preparation of the ASTERICS General Assembly AGA#4 of 20 Jun 2017, we obtained the following propositions from the 4RI representatives:

1. FROM CTA: Rene ONG

- a. MW/joint time allocation of AGNs, between, e.g. CTA, SKA and other observatories
- b. MM campaigns between CTA and other facilities - in particular, follow up of GW events, neutrino telescope triggers, etc.
- c. Galactic Center transients: given the unexplored <100 GeV short transient space, one could expect a lot of new phenomena, which will require MW (simultaneously if possible) observation
- d. **Sera Merhoff & Emma de Ona Wilhelmi**

2. FROM ELT: Michele CIRASUOLO

- a. First galaxies and epoch of reionisation: **Paolo Padovani**
- b. High-energy astrophysics in our Galaxy and AGNs: **Giuseppe Bono**
- c. Characterization of exoplanets: **Michele Cirasuolo** (TBC)

3. FROM KM3NET: Mauro TAIUTI

- a. Galactic transients: x-ray or gamma-ray binaries can be promising sources of high-energy neutrinos.
- b. Extra-galactic transients: gamma-ray bursts offer also nice opportunities to detect a signal of high-energy neutrinos.
- c. **Paschal Coyle & Damien Dormic.**

4. FROM SKA: Robert BRAUN

- a. Coordinated FRB localization and characterization (which exercises rapid response strategies) : **Evan Keana & Antonio Chrysostomou.**
- b. Correlated survey constraints on dark energy and modified gravity (which exercises large area survey coordination and data sharing): **Anna Bonaldi & Antonio Chrysostomou.**

These interactions, as well as the discussions at the AGA#4 meeting, have shown that many actions regarding MW/MM questions are already existing at different levels (ASTERICS, RI organization, EWASS...). It is thus very important for the APF to identify these actions and to gather the experience and feedbacks gained by these groups.

IV Guidelines for the 'Science Case' Working Groups

We propose the following skeleton for the report from the ten science groups defined above (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 4a, 4b). We do not expect long documents at this stage as the first Forum will also be a good opportunity to discuss into more details and confront the different approaches from the various groups.

1. Describe the main aspects of the science case. How MW/MM considerations will change the situation? Could this question be addressed by other means?
2. Which other facilities could bring unprecedented additional values to your science case?
3. Describe the specific needs for survey programs, time synchronization?
4. Which kind of VO tools will be needed for this purpose? Will you consider the use of archive data?
5. Will you need specific advances on modeling, numerical simulations?
6. What are your requests in terms of time application for the development of this program?

7. What are your requests in terms of operational constraints for your program?
8. Is there specific needs for rights on data?
9. Could you detail other actions regarding MW/MM coordination for which you are already involved?
10. Any other comments that you may want to point out for the APF Committee.

V Tentative schedule

1. Distribute guidelines to the groups (Jul)
2. Define the composition of the APF Committee with the Asterics Executive Board: representatives of the 4RI + ASTERICS WPLs + other data providers...
3. Organization of the Forum + List of invitation + Invitations (Sep)
4. Feedbacks from the groups (Oct-Nov)
5. First Policy FORUM (Jan18)
6. First exchange with the ASTERICS board and partners
7. Feb-May 2018: by the APF Committee, draft of recommendations for distribution within ASTERICS and the 4RI.
8. Jun-Sep 2018: preparation of second Policy FORUM, interactions with ASTERICS-WP and the 4RI, Asterics Board and partners
9. Dec 18: second PF
10. Final exchange with the ASTERICS board and partners
11. Mar-Apr 19: final recommendations.

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