

Enhancing the integration of gamma-ray activities within AHEAD

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WP9 Progress Meeting - 14-15 November 2017, Rome

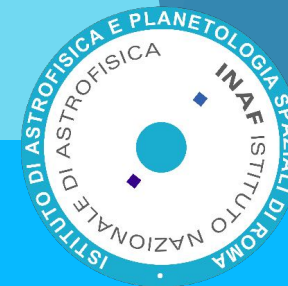


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Feedback/recommendations from MTR relevant to WP9



-The EC recognises that “**the JR4 action to coordinate the European Community working on gamma-ray astrophysics towards a joined proposal for a future ESA mission are being very fruitful**”.

-Concerning JRA4 activities related to feasibility studies of space-based instrumentation for future gamma-ray missions, I would recommend to further integrate those activities into the rest of activities of the project, more focused on X-ray astrophysics. Even if the specific research goals of the JRA4 package is well differentiated from the others, and notwithstanding the excellent progress achieved so far, there is still room for further integration and cooperation concerning, for instance, training activities, calibration activities and data analysis etc.



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AHEAD Recent Progress



- AHEAD Project start: 1 September 2015; end: 29 February 2019.
- AHEAD Goal: Development of technology and of the related research infrastructures for high energy astrophysics.
- Mid Term review achieved on 23 May 2017; outcome is a very positive report by EC
- After review, reorganisation of AHEAD activities and issue of Grant Amendment (now under revision)



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Workpackages



Work package No	Work Package Title	Lead Participant Short Name	Person-Months	Start Month	End month
WP1	AHEAD Management	INAF	60.5	1	42
WP2	NA1- General Networking. Support to Community	UNIVERSIDAD DE ALICANTE	19	1	42
WP3	NA2 -Public Outreach	NOA	77	1	42
WP4	TA1 -Access to facilities	INAF	13	1	42
WP5	TA2- Access to X-ray Data Analysis	ULEIC	23	1	42
WP6	JRA1 - Detectors for ATHENA: Innovations beyond the baseline	STICHTING SRON	155.5	1	42
WP7	JRA2 - ATHENA background simulation and scientific calibration	INAF	56	1	42
WP8	JRA 3- Characterization of optics for next generation X-ray observatories	MPG	123	1	42
WP9	JRA 4 - Assessment of gamma-ray experiments	CNRS	199.5	1	42
WP10	JRA 5 -Technology Innovation	THALES ALENIA SPACE ITALIA SPA	31	1	42
			757.5		

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Brief summary of exploited results

- ▶ **Technology development:** tradeoff studies and testing H/W components: relevant for Athena, for future implementation into a new mission design (WP6,WP7)
- ▶ **Ground facilities:** design new facilities and improve the existing ones to increase the efficiency of X-ray optics testing & calibration (WP7)
- ▶ **Instrument design and development of simulation tools:** (a) improvement in the knowledge of the instrumental background in L1/L2 orbit and update of the instrument design; (b) finalised proposal for a future gamma-ray mission; (c) development of optics simulators (WP7,WP8,WP9)
- ▶ **Build up new collaborations:** (a) large teams for joint exploitation of space and ground based observations; (b) system engineering studies in the field of technology transfer (WP2,WP10)
- ▶ **Realisation of a video for planetaria and media and exhibitional material, now used worldwide (WP3)**
- ▶ **Results of the application survey for exporting technology in other fields, including areas of societal impact (WP10)**



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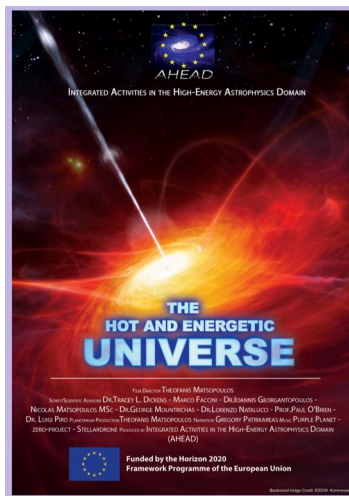


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Focus on AHEAD Networking

- Visitor program, Organisation of schools, Topical Conferences/Meetings: supporting meetings, schools and grants for visitors (WP2)
- Public Outreach: production of videos, educational material, coordination of press releases and organization of exhibitions (WP3)



Projection of the AHEAD Video "The Hot and Energetic Universe" at Researcher's Night 2017 in Frascati



The AHEAD Geant4 School (2016)



AHEAD workshop "The Power of X-ray Spectroscopy, Warsaw (2017)



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Focus on TransNational Access



- Offering TransNational Access is a core activity of the AHEAD project as part of the H2020 Infrastructures work-programme.
- Transnational Access in AHEAD is split in two different activities:

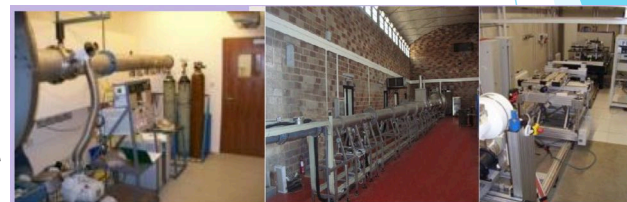
TA1) Funding team visits to **13 experimental facilities** in Europe

TA2) Funding visits to **10 research institutes** for:

Access to X-ray data analysis through archives of existing observatories like XMM-Newton, INTEGRAL, Swift, including tutorials and mentoring by experienced scientists.

Training on advanced tools: geant4, XSTAR, SPEX, etc.

- 4 AOs have been completed



X-ray Beamlines. LLTBF (Univ. of Leicester) and XACT (INAF/Palermo Observatory).

The LARIX-A hard X-ray beamline (Univ. of Ferrara).



Thermal vacuum and other test facilities. Test equipments at ERIOS (Lab. d'Astrophysique Marseille) and SERMS (Univ. of Perugia).

Plasma chamber at IAPS (INAF, Rome). High capacity shaker at the Centre Spatial de Liège (CSL)



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Institutes and Data centres for TA2



- Department of Physics and Astronomy, University of Leicester
- SRON Netherlands Institute for Space Research
- Department of Astronomy, University of Geneva
- National Institute for Astrophysics, INAF
 - Bologna: INAF-OABO, INAF-IASFBO in collaboration with the Department of Physics and Astronomy, Bologna University
 - Palermo: INAF-OAPA
 - Rome: INAF-OAR
 - Rome: INAF-IAPS
- Department of Physics and Earth Science: Università di Ferrara
- Institute of Astronomy Astrophysics, Space Applications & Remote Sensing (IAASARS), National Observatory of Athens
- AIM / Service d'Astrophysique, CEA Saclay

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AHEAD Announcements of Opportunity



Announcements of Opportunity to use AHEAD visitor program and TA programs are opened periodically with a time cadence of two per year until November 2018
The fifth AO for AHEAD (Cycle 3) will open on 20th November 2017

The AO consists of 3 separate calls for proposals:

1. **Trans-national access to ground and test facilities** (test/calibration campaigns)
2. **Visitor Program** (scientific/engineering visits to a host institute of your choice)
3. **Trans-national access to X-ray data analysis** (training or use of data archives or data analysis facilities at a specialised centre or institute)

Call 1 is always open

Deadline Calls 2-3: 5 January 2018

Visits of successful applicants are fully funded

for info visit: ahead.iaps.inaf.it

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Results of the Mid-Term Review



- Prior to the review, the AHEAD Board discussed and approved an operative strategy to optimise the project impact for the remaining periods. This implies a redistribution of budget following TA1 under-delivery.
- The Board decision concerns redistribution within (in order of priority): TA2 budget; networking activities; technology innovation (JRA5)
- The EC Committee endorsed most of the changes proposed by the AHEAD Board and raised recommendations.

Actions undergoing to accomplish recommendations:

- Reorganisation of Transnational Access (new activities by UNIFE and INAF/IAPS; funding additional visits for two successful providers)
- Strengthening of Public Outreach activities
- Strengthening of Technology Innovation WP
- **Raising integration of gamma-ray activities within AHEAD**



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Possible measures



Investigations started by a team appointed on purpose. Some of the considered options are:

- Production of **new outreach Material**:
 - 10min video including gamma-ray themes
 - poster on gravitational waves/multi-messenger astronomy, e.g. GW170817 (TBC)
- **Use of Visitor Program and TA2**. Current TA2 providers of are INAF/Bologna (BoGEMMS) and INAF/IAPS Rome (geant4 tutorials, modeling particle environment in orbit)
- Investigate possibility of **training on gamma-ray data analysis by current TA2 providers**
- Emphasize forthcoming results on **cross-calibration activities** which naturally include gamma-ray missions (e.g. INTEGRAL, Fermi) - calibration database
- **...Suggestions?**
- The final goal is submit a report to the EC with the results of the actions taken

