ATHENA COMMUNITY NEWSLETTER #1

June 2016

ATHENA

Contents

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The Athena X-ray Observatory

Editorial Board: L. Piro & R. Smith

*Front Cover image credit to MPE and Athena Team

Welcome

It is now 2 years since ESA's Science Programme Committee selected Athena (the Advanced Telescope for High ENergy Astrophysics), as the second Large-class mission of the Cosmic Vision 2015-2035 programme due for launch in 2028.

K. Nandra (ASST Lead Scientist) and X. Barcons (ACO Lead) on behalf of the Athena Science Study Team (ASST)

Athena addresses the Hot and Energetic Universe science theme recommended by a Senior Survey Committee appointed by ESA in 2013, and proposed by a vibrant community that had been developing the scientific drivers for the next generation high-energy astrophysics facility for almost 20 years. The Athena X-ray observatory concept was the result of a massive effort from this same set of scientists. In July 2014 ESA appointed the Athena Science Study Team (ASST) to provide scientific oversight on mission studies and to serve as a focal point for the interests of the community at large. In order to keep this broader community informed about the progress of the project, we are delighted to release the first issue of the Athena Community Newsletter.

Athena will be a truly transformational tool for astronomers. Its core science, formulated in the Hot and Energetic Universe theme, seeks to address the key questions of how hot gas structures in the Universe form and evolve, and how black holes grow and shape the Universe. Beyond that, as an observatory, Athena will reveal new insight into all astronomical environments where high-energy processes take place, from the Solar System to the edge of the Universe. A glimpse of the amazing science that Athena will deliver and of the forefront technologies it will utilise will be the subject of short articles in this newsletter and elsewhere known as Athena Nuggets. You will find the first nugget in this Newsletter, related to the search for the earliest growing supermassive black holes. Stay tuned in the social media for more Athena Nuggets.

Athena will be an essential part of the family of large observatories across the electromagnetic spectrum that will address the most pressing questions in astronomy by the end of next decade, including ALMA, the ELTs, SKA and CTA among others. Scientific synergies between Athena and these facilities are numerous and extremely promising. We report on page 7 about the on-going ESO-Athena synergy exercise, focusing on the synergies with optical/IR telescopes and sub/mm facilities.

The Athena mission study, led by ESA with guidance from the ASST, is progressing extremely well. Following an internal ESA study (Phase 0) in 2014, Athena entered Phase A in 2015, expected to last until late 2017. Phase A activities include studies at ESA, by industrial partners and by the two instrument proto-consortia, and comprise both conceptual design and technology development activities. In April 2016 ESA started a Mission Consolidation Review (MCR) for Athena, which has provided a snapshot of the mission status and highlighted the main topics for study and further development during Phase A. An update of the Phase A study at this point in time is presented on pages 4 and 5. Updates on the two instruments WFI and X-IFU are also provided on pages 3 and 4.

At the community level, the ASST has setup the Athena Community Office (ACO) to provide assistance in communications and organisation (contact details in the previous page). The ACO will assist the ASST in organising activities and collecting input from its Working Groups and Topical Panels (see page 2), in providing editorial support for top-level documents, maintaining a document repository for the community input and to develop communication (both internal and external) and outreach activities in support of the Athena community at large. The ACO is led by IFCA (CSIC-UC) with support from MPE, IRAP and University of Geneva.

This Athena Community Newsletter, published every 6 months, is one of the main ways that will be used to keep everyone informed about on-going activities, news and updates. Other channels also operated by the ACO will be the web portal and social networks.

We hope you enjoy reading the Newsletter.

Pass it on to your colleagues!

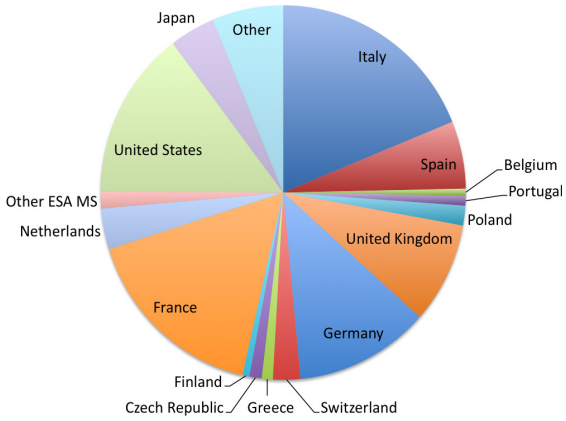
The Athena Community

A growing worldwide community of more than 800 scientists supports Athena

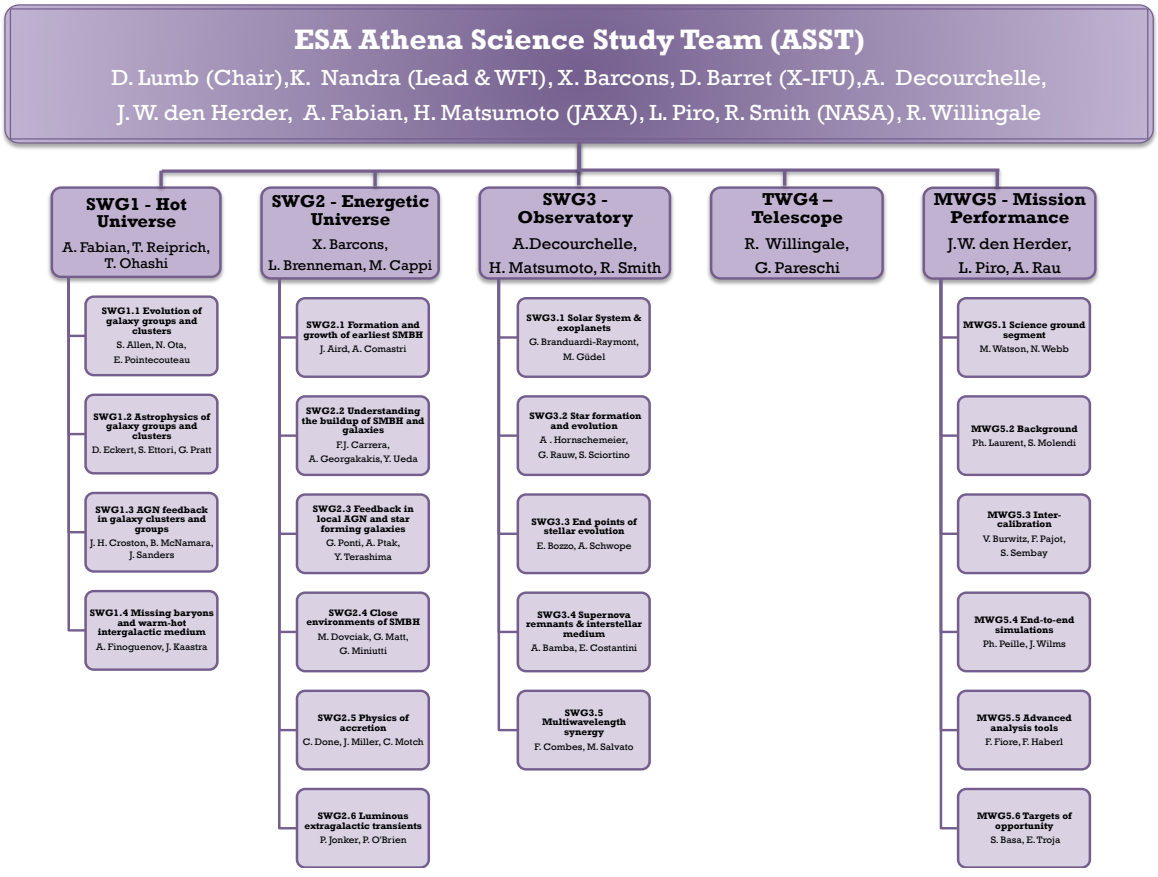
X. Barcons (ACO lead), on behalf of the ASST

The Athena community is an immense resource containing most of the critical scientific and technical knowledge needed to bring Athena to success. The Athena Community has been recruited via two calls, one in early 2015 and a second one late that year. The distribution by country of the current Athena community is shown is show in the graph. The ASST may issue further invitations in the future.

Athena Community work is organised through the structure shown below. There are 5 Working Groups (WGs) reporting to the ASST organised in terms of Topical Panels, focusing on specific scientific or performance aspects. Terms of reference for each WG and Topical Panel can be found on the Athena Community support web portal http://www.the-athena-x-ray-observatory.eu/, under the Community tag.



The ASST established the Athena Community Office (ACO) in order to obtain support in performing its tasks assigned by ESA, and most specially in the ASST role as "focal point for the interests of the broad scientific community". The ACO assists the ASST in organising and collecting support from the community, maintains membership lists and a document repository, assists in the edition of high level documents and runs communication (both internal and external) activities and outreach, including maintaining the web portal, producing and distributing a six-monthly Newsletter, and maintaining presence in social media. Communication is by definition a two-way street, so if there are issues that you would like to convey, please, drop us a line to aco@ifca.unican.es.



News from the Instruments

News from WFI

Arne Rau (WFI Project Scientist) and Kirpal Nandra (WFI Principal Investigator)

The Wide Field Imager (WFI) will provide 0.2-15 keV imaging over a large field of view, simultaneously with spectrally and time-resolved photon counting. It will enable breakthrough science in many astrophysical areas. Our understanding of the formation and growth of the first supermassive black holes will be shaped by discovering hundreds of active galactic nuclei at an epoch when the Universe had just ~5% of its current age (redshift z=6-8). Large samples of supermassive black holes obscured by large columns of gas and dust will teach us how major black hole growth events were related to galaxy build-up at an epoch when the Universe was most active (z~1-4). WFI wide-angle searches will uncover the first galaxy groups at z~2 and provide insight into their formation and growth. Constraints on the thermodynamical properties of the baryons in the outskirts of clusters of galaxies will decipher the role of non-gravitational processes in large-scale structure evolution.

To enable these demanding goals, the WFI combine a 40' x 40' field of view, composed of four identical quadrants of DEPFET active pixel sensors, with a pixel size properly sampling the angular resolution of 5'' (HEW) on-axis provided by the Athena mirror system. In addition, the WFI will offer an excellent high-count rate capability to, e.g., measure the spins of stellar mass black holes and the accretion geometries in bright Galactic binary systems. To do so, the WFI will operate a second, smaller DEPFET detector out of focus and with a very high time resolution of 80μs.

The WFI proto-consortium is led by MPE Garching in collaboration with partners in Germany, the United Kingdom, Poland, Austria, Denmark, Italy, and France. Contributions from the United States, Switzerland, Portugal, and Greece are under discussion. The heart of the camera, the specialized DEPFET active pixel sensors, are developed together with and fabricated at the Semiconductor Lab of the Max Planck Society.

Further information is available at: http://www.mpe.mpg.de/ATHENA-WFI

News from X-IFU

Didier Barret (X-IFU Principal Investigator), Thien Lam Trong (X-IFU Project Manager).

The X-IFU consortium delivered its Mission Consolidation Review data package on April 18th, 2016. This resulted from a large effort from many members of the X-IFU Consortium, most certainly CNES, which led the whole exercise. The X-IFU data package was reviewed extensively by the MCR panel. Requests for clarifications and actions to consolidate the overall X-IFU design were formulated. Emphasis should be put on consolidating the mass budget of the X-IFU, which requires reviewing the thermal, mechanical and electronics design of the instrument. Closing the design loop is expected to take place before the end of this year. At mission level ,CNES is working with ESA and the two industrial Primes (Airbus Defense and Space & Thales Alenia Space) to define a first sketch of the payload accommodation on the Focal Plane Module, where both the WFI and X-IFU are located.

The X-IFU phase A activities are ramping up with many instrument and system level tradeoffs to be instructed (e.g. monolithic versus hybrid Transition Edge Sensor array). In parallel, technology developments needed to reach a target Technology Readiness Level of 5 at mission adoption are also receiving high priority, all across the X-IFU consortium (TES, Focal Plane Assembly, cold front end electronics, warm readout electronics, thermal/optical blocking filters, aperture assembly, cryo-coolers…). Among those activities, a large effort will be put in the Detector Cooling System: a Core Technology Program (CTP) contract issued by ESA to develop and characterize a 50 mK cryogenic chain with which functional testing of a TES array will be performed. This activity is led by CNES, and CEA, with IRAP, INTA, SRON, JAXA, AIR LIQUIDE & RAL as partners.

The Fourth X-IFU Consortium meeting took place at Utrecht from May 23rd to May 25th, 2016. More than 120 X-IFU consortium members joined the meeting, whose main objective were to present the current X-IFU baseline configuration, and review

all the on-going activities of the phase A. One of the highlight of the meeting was a special "Hitomi" session, in which the Japan and US team leads, also part of the X-IFU consortium gave a complete overview of the Soft X-ray Spectrometer (SXS) as operating so smoothly in flight. The first SXS results on the Perseus cluster as presented demonstrate plainly the transformational character of high spectral resolution X-ray data, giving the X-IFU consortium even more motivation to face up the challenge of building a very ambitious X-IFU.

The X-IFU consortium is led by France (IRAP & CNES), Netherlands (SRON), Italy (IAPS), and involves six other member states (Belgium, Finland, Germany, Poland, Spain, Switzerland) and two international partners (United States and Japan).

Further information is available at: *http://x-ifu.irap.omp.eu. Twitter: https://twitter.com/AthenaXIFU*

Athena: Phase A Progress

Following the selection of Athena by the ESA Science Program Committee (SPC) the mission has entered the Phase A study.

Kirpal Nandra & Didier Barret, on behalf of the Athena Science Study Team

A number of important activities are ongoing during Phase A, including:

- System-level studies of the mission, including a spacecraft conceptual design
- Development of the instrument concepts by the instrument consortia
- Technology developments for the telescope, instruments and any spacecraft elements as required
- Discussions and preliminary agreements with international partners regarding their contributions to the mission

Phase A for Athena formally began in July 2015 and will end with the so-called Preliminary Requirements Review scheduled for November 2017. The Athena Phase A has been slightly unusual in that there has recently also been a mid-term assessment, the so-called Mission Consolidation Review (MCR). This article provides a progress report on the system-level activities for Athena, including the MCR.

System Level Studies

The spacecraft and system-level Phase A studies for Athena are being undertaken by two competing industrial consortia, one led by Airbus Defence and Space (ADS) and the other by Thales Alenia Space (TAS). Both studies have resulted in sound concepts for the Athena mission, and led to some important design choices.

An early tradeoff by ESA in their Concurrent Design Facility (CDF) study suggested that switching between the two instruments might be better achieved by tilting the mirror, rather than the instruments themselves. This has been confirmed in the industrial Phase A studies and is now the baseline assumption, and both industrial contractors have developed designs for this Movable Mirror Array (MMA).

It is also known that by the time of the expected Athena launch in 2028, the largest available European launch vehicle (Ariane 5) will have been superseded by the next generation Ariane 6. Although the Ariane 6 capabilities are being currently defined, the preliminary information available is very encouraging. It is expected that the largest version of Ariane 6 (version 64) will be at least as capable as Ariane 5 ECA, and will feature a sufficiently large fairing to accommodate the spacecraft with its 12m focal length telescope. A large (~3.9m diameter) spacecraft adapter should also be available, which is needed to accommodate the large Athena mirror, but also solves a great number of other technical issues regardless of the mirror size (e.g. shifting up the spacecraft center of gravity).

During the CDF study, the ESA team evaluated a concept with a mirror with an effective area of approximately 1.4m^2, smaller than that envisaged

in the Athena proposal ($2m^2$). One of the tasks of the industrial teams has been to compare these two configurations, and assess their feasibility. A critical part of any spacecraft design study is to estimate the mass, and its compatibility with the launch vehicle. The industrial studies have shown the smaller CDF mirror is compliant with current (conservative) assumptions about the A64 capability, with a healthy margin. The larger proposed mirror leaves insufficient mass margin based on the current design estimates, and further work is required to see how the overall mass can be reduced by optimising the spacecraft and instrument designs. Several options have been clearly identified to perform this activity.

The system studies have also made important progress in designing the spacecraft structure, service module, attitude control, power and communication systems etc. with few if any major issues identified. Further consolidation of these designs is expected as Phase A progresses.

The Mission Consolidation Review (MCR)

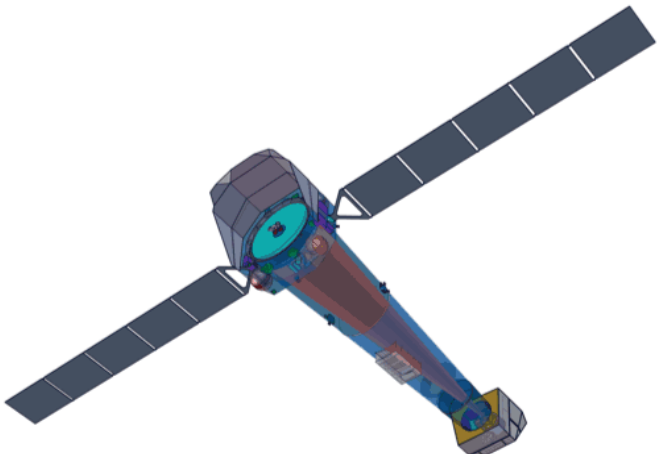
The MCR was undertaken by ESA in the middle of Phase A, with the intention to define a mission "baseline" for the rest of the study phase (particularly in terms of achievable mirror effective area), assess preparedness for the Instrument AO, and to check the mission feasibility and cost. The MCR took a broad view of the Athena mission to provide a snapshot of where the Phase A studies stand, and a clear identification of the critical areas which need to be addressed in the remainder of the Phase A process.

The technical assessment of the MCR panel summarized the main findings from the industrial studies, as discussed above. One of the main recommendation of the MCR panel was to consolidate the design of the Athena Focal Plane Module (FPM), which accommodates both instruments (WFI and X-IFU). It was concluded that it would be preferable to hand over responsibility for the FPM to the instrument teams, providing a clearer management and procurement scheme, and simpler interfaces while reducing significantly the cost of Athena to ESA. A similar approach is being followed for the PLATO mission. The MCR assessed that the Athena optics development is progressing adequately and going in the right direction, although the current performance (~10") does not yet meet the 5" Athena requirement at system level. Improving the plate stacking process was identified as the key activity to pursue. The overall schedule for Athena was considered credible by the MCR, and is mostly driven by the payload (especially X-IFU cryogenic chain)

The MCR also performed a detailed cost analysis of the mission. Their cost estimate with the current responsibility set exceeds the cost-cap set by the SPC for the ESA contribution by around 25%. The MCR suggested several ways in which this could be addressed, mostly centring around the optimisation of the share of responsibilities between ESA, the Primes and the instrument consortia and efficient use of the non-ESA contributions. Their conclusion was that the costs could be brought within the cost limit provided that the panel's recommendations can be followed and implemented. Another important finding was that the delta cost between the small and large mirror configuration is not very significant, and that the decision on the size of the mirror should be deferred until other issues clarify.

The way forward recommended by the panel was to have a further 6 month consolidation phase for the mission, allowing the project to explore the proposed solutions and clear up a number of remaining uncertainties. This consolidation period would lead to a further "delta" review, and pending sufficient progress, the definition of a mission baseline and release of the instrument AO.

The ASST (together with its working groups and Topical Panels) and the instrument proto-consortia will be active in supporting the implementation of the MCR panel recommendations, with the common goal of maximising Athena's scientific capabilities within the technical and cost constraints.



A conceptual design for the Athena spacecraft derived from the ESA CDF study, designed to be accommodated in an Ariane 5 launcher. The Moveable Mirror Array (MMA) is located at the top with the focal plane instruments to the bottom, surrounded by radiators to maintain appropriate thermal control. A fixed optical bench provides the 12m focal length. The spacecraft design has been examined in more detail by the industrial consortia performing the ESA Phase A studies.

Baby black holes at the cosmic dawn of the energetic Universe

Andrea Comastri (INAF/Osservatorio Astronomico di Bologna), Giorgio Lanzuisi (Dipartimento di Fisica e Astronomia, U di Bologna), James Aird (Institute of Astronomy, U of Cambridge)

Accreting black holes with masses several billions larger than that of the Sun when the age of the Universe was about one twentieth of the current one, are routinely discovered by optical surveys. This very observational fact raises several profound questions such as: How did the turbulent gas in the early Universe manage to quickly cool and form seed black holes? How did these seed black holes acquire mass at a rate seemingly exceeding the limits imposed by accretion physics?

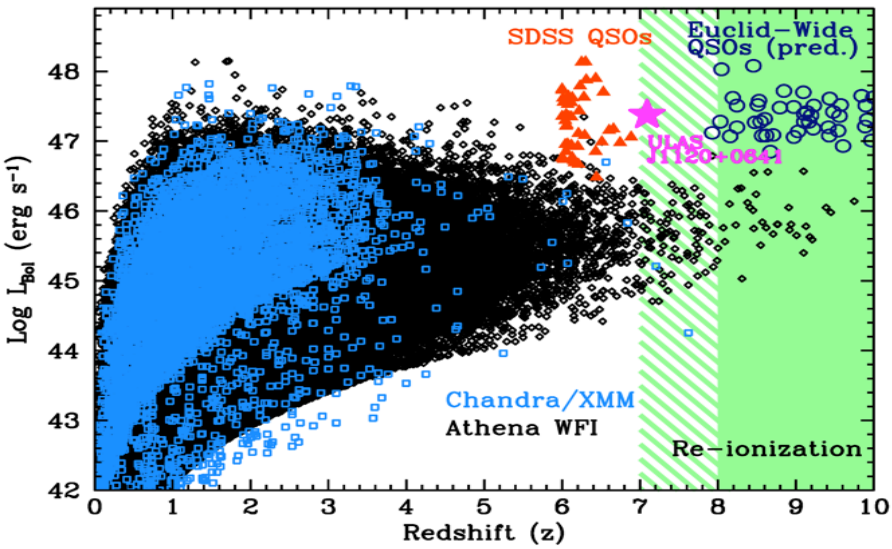
Even more puzzling is the relation between the mass of the central black hole and that of the host galaxy and whether it was established at the birth, or is the consequence of some unknown process at work since the early phases.

Large optical and near-IR surveys have identified massive black holes in the early Universe ($z > 6$), but are inevitably biased towards the most luminous Quasars. X-ray surveys with the current state of the art facilities Chandra and XMM-Newton yielded only a handful of X-ray selected Active Galactic Nuclei (AGN) close to $z\sim6$.

To shed new light into the birth and early evolution of the first luminous objects in the Universe we need to uncover the bulk of the population of young accreting black holes at $z > 6$. They are much more difficult to detect than the big monster Quasars hosting billion solar mass black holes.

Also, they remain elusive because the majority of the accretion energy -- which can easily exceed several billion times the Sun's luminosity -- is absorbed by thick layers of dust and gas and, hence, escapes direct optical detection, but not in X-rays. Uncovering and studying the physics and the evolution of young and obscured black holes is one of the main objectives of Athena surveys.

Athena, with its unprecedented X-ray sensitivity and wide field of view will profoundly change the current picture. The Athena Wide Field Imager will push the current limits to redshifts as high as 8-10 and reveal typical, moderate-luminosity, obscured AGN, placing vital constraints on the mechanisms driving the initial formation and early growth of black holes during this key epoch. The Athena multi-tiered surveys will also probe the epoch of Re-ionization when the first light at the cosmic dawn started to break down the neutral hydrogen in the intergalactic space into protons and electrons. Energetic X-ray photons will provide deep insights on the formation of the first accreting black holes and their interplay with the rapidly evolving surroundings.



Predictions for the redshifts and luminosities of ~600,000 AGN that will be identified with a multilayered 1-year Athena WFI survey, including >400 sources at $z > 6$, compared to current Chandra and XMM-Newton surveys. Athena will identify AGN that are ~2 orders of magnitude fainter than current optical and near-IR surveys (e.g. SDSS) pushing the redshift limits much beyond that of the current record holder at z~7.1. Athena will discover more than 120 moderate luminosity AGN at z>7 and well within the Re-ionization epoch, which according to the most recent measurements, is found to lie in the redshift range ~7.5-9.5. The X-ray sources will provide an essential complement to the luminous Quasars that will be identified by Euclid.

ESO-Athena synergy exercise: status report

Athena will be part of a unique set of astronomical observatories in the late 2020s. Synergies among them need to be identified and developed. The first ones to be explored will be between Athena and ESO's facilities.

P. Padovani (ESO, EAST chair), S. Martínez-Núñez (ACO) and X. Barcons (ACO Lead)

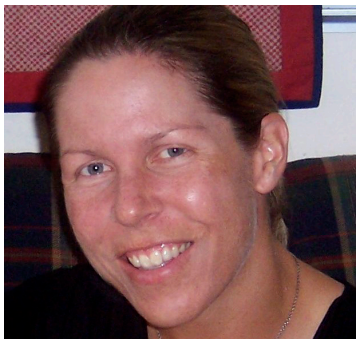
ESA's Athena Science Study Team (ASST) and ESO have jointly set up the ESO-Athena Synergy Team (EAST) to work out in detail synergies between Athena and ESO's facilities available by the time Athena operates. These facilities include ESO's E-ELT and VLT as well as other 8-10m class telescopes on the one hand, and ALMA and other sub/mm interferometers and single-dish telescopes on the other hand.

The EAST was asked to deliver Synergy White Papers identifying and developing these synergies. These scientific synergies come in different flavours, including the needs for data from other facilities to achieve Athena's science objectives, the symmetric case as well as genuine added-value science achievable only by putting together observations by Athena and other facilities, benefiting the overall science output. In broad terms, synergy areas include: early groups/clusters and their evolution, the structure of the intra-cluster medium, the warm/hot intergalactic medium, accretion physics, super-massive black hole accretion & growth history, AGN outflows and feedback, high-z GRBs, Young stellar objects, low-mass stars, massive stars, interstellar medium, Supernovae and exoplanets.

The EAST comprises experts covering X-ray, optical/NIR and sub/mm observational wavelengths, and it is composed by: Françoise Combes (OPM), María Díaz-Trigo (ESO), Stefano Ettori (INAF/OABO), Evanthia Hatziminaoglou (ESO), Peter Jonker (SRON), Paolo Padovani (ESO, chair), Mara Salvato (MPE) and Serena Viti (UCL). The Athena Community Office is assisting in this exercise and it is the main interface between the EAST and the Athena activities. Support by ESO, ESA, and MPE is being provided.

The EAST kicked-off its activities in March 2016 by identifying synergy themes and preparing an ESO-Athena Synergy Workshop that will bring in essential community input to the process. Participants from the community developing the specific synergy themes have been identified and invited to the workshop, which will be hosted by ESO in Garching (Germany) on 14-16 September 2016. For further information about this workshop, please visit "http://venus.ifca.unican.es/EASW2016". The EAST will distill the outcome of the Workshop and prepare the Synergy White papers, with expected delivery date of March 2017.

Athena Community People



Laura Brenneman

I am an astrophysicist at the Smithsonian Astrophysical Observatory (Cambridge, MA, USA). I study the X-ray properties of supermassive black hole systems in AGN and have leadership roles in designing future X-ray missions for NASA and other international space agencies. I have been a pioneer in the field of determining how fast black holes spin and published over 40 articles in scholarly journals on my research, including a short book on measuring the angular momenta of black holes (Springer, 2013).

I am currently a co-leader of Athena's "Energetic Universe" science working group, charged with overseeing the development of the science objectives and observing plan for the study of the formation, growth and evolution of moderate- to high-redshift AGN, feedback from local AGN and star-forming galaxies, the immediate environments of supermassive black holes, the physics of accretion in stellar-mass binary systems, and luminous extragalactic transients.

lbrenneman@cfa.harvard.edu

Andy Fabian

I am an X-ray astronomer based at the Institute of Astronomy in the University of Cambridge UK. Currently I am the Acting Director of the Institute and run a research group funded by an ERC Advanced Grant. Over the years I have worked on data from most X-ray satellites and observed most classes of X-ray source. Lately, my interest has centred on how accreting black holes work, heating and cooling within the cores of clusters and how black holes control their surroundings. Most recently I have worked on the Hitomi SXS calorimeter observation of the Perseus cluster, which has given a direct indication of what will be possible with the much more powerful Athena XIFU.

I am a member of the Athena Science Study Team, a Fellow of the Royal Society and a Foreign Associate of the US National Academy of Sciences.

acf@ast.cam.ac.uk

Etienne Pointecouteau

I am a researcher at IRAP (Toulouse, France). I have been involved in the preparation and/or the exploitation of infrared, millimetre and X-ray experiments (ISO, Pronaos, XMM, Planck, SPICA, NIKA).

My research focus on clusters of galaxies to understand the formation and the evolution of large scale structures. The high throughput and the high spectral resolution of Athena will provide me with a unique mean to pursue this goal, through the study of the dynamics and the chemical composition of the hot intra-cluster gas.

I am co-chairing the Athena Topical Panel on the evolution of groups and clusters of galaxies. I am a co-I of the X-IFU instrument and a member of its science advisory team. At IRAP, I work in close collaboration with the X-IFU PI, the instrument scientist and the team developing the readout electronics for the detector.

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Jörn Wilms

I did my PhD (1998) and habilitation (2002) in Ruediger Staubert's X-ray astronomy group in Tuebingen (D). From 2004 until 2006 I was a lecturer in astronomy and astrophysics at the University of Warwick.

Since 2006 I have been a professor for astronomy and astrophysics at the University of Erlangen-Nuremberg.

I am mainly interested in Athena observations of X-ray binaries and Active Galaxies (relativistic lines, reflection, SED studies), but also in spectroscopic studies of photoionized plasmas and the ISM in general. As a member of the eROSITA consortium I am also looking forward to follow up observations of eROSITA discovered sources.

Within the Athena team I am responsible for the group of people developing the end to end simulation software for the WFI and the X-IFU detectors.

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COSPAR Event: The Hot and Energetic Universe with the Large X-ray Observatory Athena. Istanbul (Turkey)

L. Piro (INAF, IAPS. Main Scientific Organizer) & A.C. Fabian (Institute of Astronomy, University of Cambridge. Deputy Organizer)

Sunday 31st July 2016	Monday 1st August 2016
9:30 Athena Mission Status (D. Lumb)	9:30 Understanding the build-up of supermassive black holes and galaxies (F. Carrera, A. Georgakakis & Y. Ueda)
10:00 Athena Science Status (A. Fabian)	9:50 Can supermassive black holes influence the evolution of galaxies ? (F. Tombesi)
10:30 The Athena Mirror (E. Wille)	10:10 Physics of Accretion (C. Done)
11:30 High resolution imaging X-ray spectroscopy: the X-IFU instrument on Athena (F. Pajot)	10:30 X-ray Binary Populations and their Role as a Feedback Mechanism in Cosmological Scales (T. Fragos et al.)
11:55 The Wide Field Imager for Athena (A. Rau)	10:45 Activities for the High Energy Astrophysics Domain (AHEAD) (G. Mountrichas & I. Georgantopoulos)
12:20 Athena Mission performance (L. Piro)	11:30 Athena prospects for the study of the end points of stellar evolution (E. Bozzo & A. Schwope)
12:45 Hydrodynamical cosmological simulations and optimization of Athena's observational strategies (E. Rasia et al.)	11:50 The astrophysics of supernova remnants and the interstellar medium (B. Williams)
14:00 The evolution of galaxy groups and clusters (P. Mazzotta)	12:10 Science enabled by ATHENA: Solar system targets and exoplanets (G. Branduardi-Raymont)
14:20 AGN feedback in galaxy clusters and groups (M. Hardcastle)	12:30 Spectral characterization of hot subdwarf stars with ATHENA+ (N. La Palombara & S. Mereghetti)
14:40 Astrophysics of galaxy clusters (S. Ettori)	12:45 Athena's Constraints on the Dense Matter Equation of State from Quiescent Low Mass X-ray Binaries (S. Guillot)
15:00 Studying high redshift galaxy groups with the Athena Wide-Field-Imager (F. Pacaud et al.)	
15:15 High-Energy activity in the central molecular zone: present X-ray view, future observations and Athena prospects (A. Goldwurm & R. Terrier)	
17:00 The light up and early evolution of high redshift Supermassive Black Holes (A. Comastri et al.)	
17:20 Studying transient events with Athena (P. O'Brien)	
17:40 The close environment of Supermassive Black Holes (G. Matt)	
18:00 A model for testing strong gravity via X-ray reflection spectroscopy (C. Bambi et al.)	

AHEAD Announcement of Opportunity Cycle 2

The AHEAD (Integrated Activities for High Energy Astrophysics) project solicits proposals for its program of transnational visits. This program offers access free-of-cost to some of the best European test and calibration facilities, training/mentoring on X-ray data analysis and visits of scientists/engineers at all expertise levels.

Submission Deadlines: 30 June 2016, 17:00 CET

For further information: http://ahead.iaps.inaf.it/?page_id=365

Athena in Conferences 2016

Past conferences (in 2016) where Athena has been present

- XMM-Newton: the next decade, ESAC, Madrid, Spain, 9-11 May 2016. *Athena: ESA's X-ray observatory to study the Hot and Energetic Universe in the late 2020s (X.Barcons)*
- SAIT, Italian Astronomical Society, Rome, 2-6 May 2016. *Athena (L. Piro & A. Comastri)*

Upcoming conferences where Athena will be present

- The Hot and Energetic Universe with the Large X-ray Observatory Athena. COSPAR 41th Scientific Assembly, Istanbul, Turkey, 31 July- 1 August 2016. Programme of Athena sessions on page 9.
- SPIE Astronomical telescopes and instrumentation: Ultraviolet to Gamma Ray Edinburgh, 26 June - 1 July 2016 (sessions on Athena on 30 June and 1 July 2016).
- Active Galactic Nuclei: what's in a name? ESO, Garching, 27 June- 1 July 2016. *How Super-Massive Black Holes grow and shape galaxies. The promise of the Athena X-ray Observatory (X. Barcons).*
- Spanish Astronomical Society, Bilbao, 18 - 22 July 2016. *Athena: the ESA's X-Ray observatory to study the Hot and Energetic Universe in the late 2020s (X. Barcons).*
- ESO-Athena Synergy Workshop, ESO, Garching, 14-16 September 2016. *Full programme under http://venus.ifca.unican.es/EASW2016.*

SPIE. ASTRONOMICAL TELESCOPES + INSTRUMENTATION

Edinburgh International Conference Centre
Edinburgh, United Kingdom
26 June - 1 July 2016

Session on Athena I (30 June, 13:45 - 15:35)
■ Athena: the advanced telescope for high energy astrophysics (Invited Paper, K. Nandra)
■ Athena: system studies and optics accommodation (M.R. Ayre et al.)
■ The Athena optics development (M. Bavdaz et al.)
■ Silicon pore optics for the Athena telescope (M.J. Collon et al.)
■ Mass production of silicon pore optics for Athena (E. Wille et al.)
Session on Athena II (WFI) (1 July, 9:00 - 10:15)
■ The wide-field imager instrument for Athena (N. Meidinger et al.)
■ Athena Wide Field Imager key science drivers (A. Rau et al.)
■ Studies of prototype DEPFET sensors for the wide field imager of Athena (W. Treberspurg et al.)
■ WFI electronics and on-board data processing (M. Plattner et al.)
■ Thermal analysis of the WFI on the Athena observatory (M. Fürmetz et al.)
Session on Athena III (X-IFU) (1 July, 10:45 - 12:15)
■ The Athena x-ray integral field unit (D. Barret et al.)
■ X-IFU Instrument: technical challenges and preliminary design (T. Lam Trong et al.)
■ TES pixel parameter design of the microcalorimeter array for the X-ray integral field unit on Athena (S.J. Smith et al.)
■ The focal plane assembly for the Athena x-ray integral field unit instrument (B.D. Jackson et al.)
■ Preliminary thermal architecture of the X-IFU instrument dewar (I. Charles et al.)
■ The cryogenic anti-coincidence detector for Athena X-IFU: a program overview (C. Macculi et al.)

http://spie.org/AS/conferencedetails/space-telescopes-and-instrumentation-uv-to-gamma#session-16