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**Title**                      ATHENA Italian Management Plan

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|       |            |                 |                       |
|       |            |                 |                       |

## Abbreviations and acronyms

| Item   | Meaning                            |
|--------|------------------------------------|
| AIT    | Assembly Integration and Test      |
| APO    | ATHENA Project Office              |
| ASI    | Agenzia Spaziale Italiana          |
| ASW    | Application Software               |
| CADM   | Configuration and Data Management  |
| CNR    | Consiglio Nazionale delle Ricerche |
| CPO    | Central Project Office             |
| CryoAC | Cryogenic Anticoincidence          |
| FA     | Funding Agency                     |
| FEE    | Front End Electronics              |
| FPA    | Focal Plane Assembly               |
| GSE    | Ground Segment                     |
| ICU    | Instrument Control Unit            |
| INAF   | Istituto Nazionale di Astrofisica  |

|       |                                  |
|-------|----------------------------------|
| LPO   | Local Project Office             |
| MP    | Management Plan                  |
| OBS   | Organization Breakdown Structure |
| PA    | Product Assurance                |
| PBS   | Product Breakdown Structure      |
| PS    | Project Scientist                |
| SM    | System Manager                   |
| UniGE | University of Genova             |
| UniPA | University of Palermo            |
| WBEE  | Warm Back End Electronics        |
| WBS   | Work Breakdown Structure         |
| WEE   | Warm Electronics                 |
| X-IFU | X-ray Integral Field Unit        |

## Applicable Documents

| [AD#] | Doc. Reference                                 | Issue | Title                        |
|-------|------------------------------------------------|-------|------------------------------|
| [AD1] | Athena Science Requirement Document            | 2.1   | SRE-S/ATH72015701, Issue 2.1 |
| [AD2] | Experiment Interface Document – Part A (EID-A) |       | ESA.ATHENA-ESTEC-SYS-IF0001  |

## Reference Documents

| [RD#] | Doc. Reference            | Issue | Title                                                          |
|-------|---------------------------|-------|----------------------------------------------------------------|
| [RD1] | ECSS-M-ST-10C             |       | Space project management - Project planning and implementation |
| [RD2] | XIFU-INAF-SYS-PL-0001-r02 | 1     | X-IFU Italian Management Plan                                  |

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# 1 Introduction

## 1.1 Scope

The scope of this management plan (MP) is to describe the management of the Italian team in the ATHENA space mission and to clarify roles and responsibilities within the Italian team.

Objective of this document is to provide a structured and consistent approach to the Italian management of the ATHENA project to be compliant with the ESA programmatic development.

This MP considers all the project management activities that are addressed by the ESA standard ECSS-M-ST-10C "Space project management" in the framework of the Italian Collaboration in the ATHENA mission.

The Funding Agency (FA) responsible for the national contribution to the mission is the Italian Space Agency (ASI).

## 1.2 Applicability

This document is applicable in the framework of the Italian participation in the ATHENA ESA mission.

# 2 ATHENA Italian Team Activities

The Italian contribution to the ATHENA mission is primarily dedicated to the X-IFU, with Co-PI (INAF) and leadership of elements with high scientific impact: the reduction of the instrument background (INAF), the CryoAC (INAF, UniGe, CNR-IFN), the thermal filters (UniPa and INAF), the Instrument Control Unit (INAF), and the Science Innovation Center (INAF, ASI) which is a valuable part of the ground segment. In addition to the strong scientific co-investigation, also highlighted by the chairmanship (INAF) of the XIFU science team (XSAT), further contribution is on calibrations (INAF).

Participation in the WFI (INAF) has been focused on optical filters and background simulations, in synergy with the X-IFU.

INAF covers a leading role on the mission environment definition, addressing the ESA selection of the orbit (L1 vs L2), and producing requirements for the particle monitor.

ESA is responsible for the optics with the support of dedicated WG (co-chair: OAB). For the integration phase, two facilities are under construction (Beatrix and VERTEX) within an industrial contract under INAF control.

# 3 ATHENA Italian Team Organization

The Italian team of the ATHENA mission is led by Luigi Piro, the ATHENA Italian Science Leader and Co-PI of X-IFU. The lead of the team is the liaison with ASI. The Italian institutions directed involved in the project are:

- INAF
- CNR
- University of Genova (UniGe)

- University of Palermo (UniPa)

### 3.1 Team Organization Structure

As shown in the previous section, the Italian team is involved in several activities widely distributed in the ATHENA project.

Notwithstanding the wide coverage area, all the activities are characterized by the following crucial commonalities: (1) the national scientific and programmatic coordination carried out by the Italian Science Leader, (2) the funding provided by ASI.

Taking into account these commonalities, all the Italian project activities are coordinated by a Central Project Office (CPO) which is in charge of controlling and supporting all the Instrument Project Offices (IPOs) and relative Local Project Offices (LPOs).

The LPOs are in charge of developing the items under national responsibility.

Figure 1 shows the Organization Breakdown Structure (OBS).

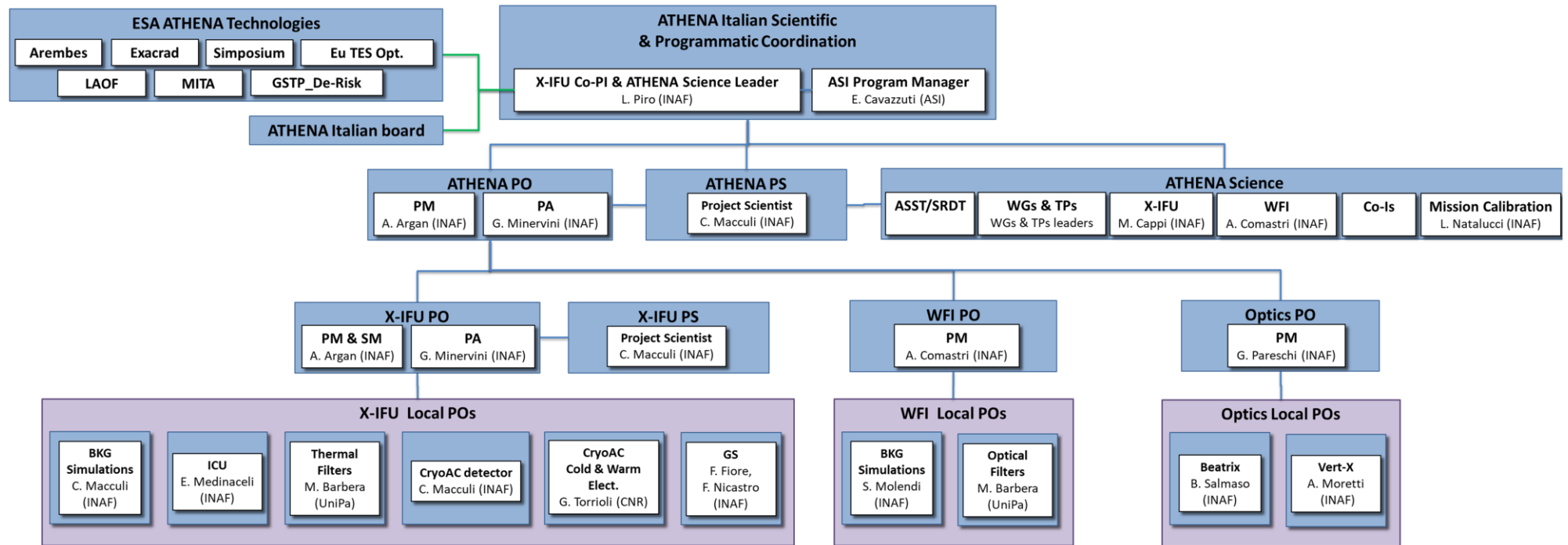


Figure 1: the Organization Breakdown Structure (OBS) of the Italian team activities in the X-IFU Consortium

## 3.2 Key persons

The Mission Italian Key-Persons (MI-KP) are members of the Italian team having specific roles in the frame of the project.

### 3.2.1 Science Leader

The Italian team of the ATHENA mission is led by the Italian Science Leader and Co-Principal Investigator (Co-PI) of the XIFU instrument, Luigi Piro (INAF). His role and responsibilities are summarized below.

The Science Leader shall:

- be, together with ASI Program Manager, fully responsible for the Italian participation to the mission and for program and delivery of flight/ground subsystems/units/equipment to ESA and/or the Instrument consortia
- verify the correct implementation of scientific and programmatic requirements with the support of the CPO Manager, the Project scientist and the Science team during all the development of the program
- verify that the scientific objectives be satisfied and provide the final approval for the compliance to requirements giving formal evidence of the fulfilment to ASI Program Manager
- approve the delivery of the formal documentation
- represent the Italian ATHENA Team at all the mission formal meetings
- The Science Leader can ask advise regarding programmatic and scientific matters to the Athena Italian Board, composed by the responsables of Italian contribution to the mission, and by representatives of the key scientific institutes of the Athena consortium.

### 3.2.2 ASI Program Manager

The ASI Program Manager shall manage funding and contracts with involved Italian Institutes and Industries.

The ASI Program Manager share with the ATHENA Italian Science Leader the final responsibility towards the ATHENA consortia and ESA for the delivery of the flight/ground subsystems/units/equipment.

### 3.2.3 ESA ATHENA Technologies

ESA has funded eight projects related to the ATHENA mission to sustain the development of the most critical technologies involved in the ATHENA project.

The eight project mentioned above are:

- AREMBES
- EXACRAD
- SIMPOSIUM
- OPTITES
- LAOF
- LAOF-CCN

- MITA
- GSTP\_De-Risk

### 3.2.3.1 AREMBES

The AREMBES (Athena Radiation Environment Models and X-Ray Background Effects Simulator, ESA Contract No. 4000116655/16/NL/BW) is aimed at developing (1) a software simulator based on Geant4, capable of addressing all the background issues that the ATHENA mission will experience during its lifetime, (2) an improved environment models for the L2 vs L1 orbit radiation .

The Italian responsible of the AREMBES is Dr. Claudio Macculi

The Italian members of the AREMBES project are reported in Table 1.

*Table 1: the AREMBES team members.*

| Name                                                     | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claudio Macculi<br>(INAF/IAPS Roma)                      | <ul style="list-style-type: none"> <li>• Project Manager of the main project</li> <li>• Project manager of CCN1 (Contract Change Notice 1)</li> <li>• Project Manager of CCN2 (Contract Change Notice 2)</li> <li>• WP leader: WP0 “Project Management” (for all 3 contracts)</li> </ul>                                                                                                                                                                                                                                                                                                      |
| Andrea Argan<br>(INAF HQ)                                | <ul style="list-style-type: none"> <li>• Project office team member</li> <li>• Head of the Project control</li> <li>• WP leader: WP8 “Update and Maintenance”</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Monia Rossi<br>(INAF/IAPS Roma)                          | <ul style="list-style-type: none"> <li>• Project officer team member</li> <li>• Support to the Coordinator for legal, financial and administrative aspects, and for overall management activities</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                  |
| Diana Martella<br>(INAF/IAPS Roma recently moved to ASI) | <ul style="list-style-type: none"> <li>• Project officer team member</li> <li>• Support to the Coordinator for legal, financial and administrative aspects, and for overall management activities</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                  |
| Silvano Molendi<br>(INAF/IASF Milano)                    | <ul style="list-style-type: none"> <li>• Project Scientist</li> <li>• WP leader: WP1 “Radiation Effects and Experience from Previous X-Ray Missions and Consolidation of Requirements”</li> <li>• WP leader: WP CCN1: 1 “L1 particle environment characterization”</li> <li>• Task leader: Task 1.1 “Effects of particles as measured by previous X-ray missions”</li> <li>• Task leader: Task 8.2 “Radiation Effects and Experience from Previous X-Ray Missions and Consolidation of Requirements Update”</li> <li>• Task leader: Task CCN2: 0.2 “SPL outreach and MAR feedback”</li> </ul> |
| Simone Lotti<br>(INAF/IAPS Roma)                         | <ul style="list-style-type: none"> <li>• Deputy Project Scientist</li> <li>• WP leader: WP3 “Analysis and Improvement of Radiation Transport and Effects Models”</li> <li>• Task leader: Task 3.4 “EM interaction extensive testing”</li> <li>• Task leader: Task 7.5 “X-IFU comparison”</li> </ul>                                                                                                                                                                                                                                                                                           |

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | <ul style="list-style-type: none"> <li>WP leader: WP CCN1: 2 “Simulation of L1 effect on Athena by Geant4”</li> <li>Task leader: Task CCN1: 2.1 “X-IFU cross-check L1 vs L2”</li> <li>Task leader: Task CCN2: 1.4 “Effects on x-ray detectors”</li> <li>Task leader: Task CCN2: 2.2 “High energy physics”</li> </ul>                                                                             |
| Monica Laurenza<br>(INAF/IAPS Roma) | <ul style="list-style-type: none"> <li>Task leader: Task 2.2 “Influence of Solar Energetic Particles (SEP) events in the L2 environment”</li> <li>Task leader: Task CCN1: 1.1 “Energetic particles environment”</li> </ul>                                                                                                                                                                       |
| Teresa Mineo<br>(INAF/IAFS Palermo) | <ul style="list-style-type: none"> <li>Task leader: Task 3.2 “Low-angle protons interactions testing and validation by ray-tracing technique”</li> <li>Task leader: Task 8.5 “Update on low angle surface process”</li> </ul>                                                                                                                                                                    |
| Valentina Fioretti<br>(INAF/OAS)    | <ul style="list-style-type: none"> <li>Task leader: Task CCN2: 1.5 “Effects on X-ray optics”</li> <li>Task Leader: Task CCN2: 2.1 “Low energy Physics”</li> <li>Task leader: Task 7.2 “Magnetic diverter and Silicon Pore Optics”</li> </ul>                                                                                                                                                     |
| Andrea Bulgarelli<br>(INAF/OAS)     | <ul style="list-style-type: none"> <li>WP leader: WP7 “Validation of the Simulator”</li> <li>Task leader: Task 5.1 “System Requirement Definition and ATHENA event filter and data format”</li> <li>Task leader: Task 3.3 “Low-angle protons interactions extensive testing by Geant4”</li> <li>Task Leader: Task 7.2 “Magnetic diverter, Silicon Pore Optics, Scientific Validation”</li> </ul> |

### 3.2.3.2 EXACRAD

EXACRAD was an ESA funded activity with Italian lead. It closed in the spring of 2021

The activity was centered on making key measurements of the interaction of particles such as protons and electrons with X-ray detectors and the materials surrounding them.

The Italian responsible of the EXACRAD is Dr. S. Molendi (INAF).

The Italian members of the EXACRAD project are reported in Table 2.

Table 2: the EXACRAD team members.

| Name                        | Function               |
|-----------------------------|------------------------|
| Silvano Molendi<br>(INAF)   | EXACRAD Italian PI     |
| Simone Lotti<br>(INAF)      | Project Scientist      |
| Fabio Gastaldello<br>(INAF) | Vice Project Scientist |

### 3.2.3.3 SIMPOSIUM

The SIMPOSIUM (Silicon Pore Optics SIMulation) project is aimed to develop an open source, user-friendly Silicon Pore Optics (SPO) simulation tool capable to predict in detail the ATHENA optical response taking into account the optical configuration, mirrors module deformations, misalignment, stray-light and diffraction effects across the whole field of view.

The Italian participation is focused on the management, the coordination of the team (INAF and DTU) and on the development of SW tools, in particular of the diffractive effects simulator (SWORDS SoftWare for Diffraction Simulation of silicon pore optics) based on physical optics laws.

The Italian responsible of the SIMPOSIUM is Giorgia Sironi (Technologist at INAF-Osservatorio Astronomico di Brera)

The Italian members of the SIMPOSIUM project are reported in Table 3.

*Table 3: The SIMPOSIUM team members*

| Name                            | Function                                                   |
|---------------------------------|------------------------------------------------------------|
| Giorgia Sironi<br>(INAF)        | SIMPOSIUM PI.<br>WP 3000 4000 responsible                  |
| Alberto Moretti<br>(INAF)       | WP 1000 responsible                                        |
| Giampiero Tagliaferri<br>(INAF) | WP 4000 support                                            |
| Rachele Millul<br>(INAF)        | WP 4000 support                                            |
| Dino Fugazza<br>(INAF)          | WP 1000 3000 support                                       |
| Giovanni Pareschi<br>(INAF)     | WP 1000 3000 support                                       |
| Daniele Spiga<br>(INAF)         | WP 1000 3000 support<br>Former responsible of the contract |

### 3.2.3.4 OPTITES

The OPTITES (Optimization of a European Transition Edge Sensor Array ESA Contract No. 4000114932/15/NL/BW) is aimed at developing an European TES array. The Italian participation is focused on the CryoAC technologies.

The Italian responsables of the OPTITES is Dr. Claudio Macculi (INAF) and Prof. Flavio Gatti (UniGE).

The Italian members of the OPTITES project are reported in Table 4.

Table 4: The OPTITES team members.

| Name                                                         | Function                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claudio Macculi<br>(INAF/IAPS Roma)                          | <ul style="list-style-type: none"> <li>WP leader: WP7 “Upgrade of CryoAC sensor design Maturity”</li> <li>Task leader: Task 7.1 “Prepare work plan”</li> <li>Task leader: Task 8.1 “Prepare work plan”</li> <li>Task leader: Task CCN2: 3b “Detailed design of Cryogenic Anticoincidence system”</li> </ul>                             |
| Matteo D’Andrea<br>(INAF/IAPS Roma)                          | <ul style="list-style-type: none"> <li>Task leader: Task 7.4 “Validation of test set-up”</li> <li>Task leader: Task 7.5 “Performance test”</li> <li>Task leader: Task 8.5 “Modification and re-shaping of test setup + definition of test procedures”</li> <li>Task leader: Task 8.7 “Support integrated array tests @ SRON”</li> </ul> |
| Flavio Gatti<br>(Genova University, Physics dpt.)            | <ul style="list-style-type: none"> <li>WP leader: WP8 “CryoAC array development”</li> <li>Task leader: Task 8.3 “Detailed design of CryoAC system”</li> <li>Task leader: Task CCN2: 5b “Cryogenic Anticoincidence system Fabrication and Performance characterization”</li> </ul>                                                       |
| Lorenzo Ferrari Barusso<br>(Genova University, Physics dpt.) | <ul style="list-style-type: none"> <li>Task leader: Task 7.3 “Single pixel fabrication”</li> <li>Task leader: Task 8.4 “Array fabrication”</li> </ul>                                                                                                                                                                                   |

### 3.2.3.5 LAOF

The LAOF is aimed at investigating new technologies of thin filters for x-ray detectors in space.

The following technologies have been investigated: silicon nitride supported by Si mesh, polyimide supported by polyimide meshes, carbon nanotube pellicles supported by metal meshes.

The Italian participation is focused on the design and characterisation of filter breadboards aiming at a potential application on Athena.

The Italian responsible of the LAOF is Prof. Marco Barbera (UniPa).

### 3.2.3.6 MITA

The MITA is aimed at testing the effects of micro meteorite impacts on thin filters with particle mass range and fluence expected on the Athena mission.

The Italian participation is focused on design and procurement of filter breadboards as well as on carrying on the bombardment tests and analysing the results.

The Italian responsible of the MITA is Dr. Ugo Lo Cicero (INAF).

### 3.2.3.7 GSTP\_De-Risk

The GSTP\_De-Risk is aimed at investigating the use of carbon yarn based meshes to support carbon nanotube filters.

The Italian participation is focused on the design and characterization of filter breadboards aiming at a potential application on Athena.

The Italian responsible of the GSTP\_De-Risk is Prof. Marco Barbera (UniPa).

### 3.2.4 ATHENA Italian Board

The ATHENA Italian Board is composed of all the Italian key-person involved in the ATHENA mission at science and project level.

The ATHENA Italian Board cover an advisory role with respect to the ATHENA Italian Science Leader.

The Italian members of the ATHENA Italian Board are listed here below.

- Chair: L. Piro (INAF)
- G. Pareschi (INAF), G. Torrioli (CNR), F. Nicastro (INAF), T. Mineo (INAF), M. Barbera (UniPA), A. Argan (INAF), A. Comastri (INAF), S. Molendi (INAF), F. Fiore (INAF), G. Matt (UniRoma3), E. Medinaceli (INAF), C. Macculi (INAF), S. Etori (INAF), S. Ligorì (INAF), M. Cappi (INAF), F. Gatti (UniGE), S. Sciortino (INAF), R. Della Ceca (INAF).

### 3.2.5 ATHENA Project Office

The APO is responsible for managing and controlling the implementation of the scientific and programmatic tasks in charge of the Italian teams, and supports the ATHENA Italian Science Leader in the verification of their correct programmatic and scientific implementation.

#### 3.2.5.1 ATHENA Project Manager

The Project Manager (PM) of the ATHENA Italian team is Dr. Andrea Argan (INAF).

The deputy PM is Dr. Gabriele Minervini (INAF).

The PM has the responsibility for managing, at central level, the project during its phases to achieve the functional and performance requirements within the approved schedule and budget. The PM directs all the top-level Management activities of the project supported by the Italian team managers. The PM works closely with the ATHENA Italian Science Leader in all aspects of the project that might significantly affect the scientific performance of the Italian contributions, including cost budget, and calls and chairs the internal reviews.

The PM with the ATHENA Science Leader manages the programmatic interface with Italian Space Agency (ASI). In this context, the project activities and relevant cost plan are defined and the funding plan and the allocation of resources are agreed.

### 3.2.5.2 ATHENA PA Manager

The Product Assurance Manager figure is covered by Dr. Gabriele Minervini (INAF).

The PA Manager is responsible for the coordination of the PA activities carried out by the teams managed by the ATHENA Italian Science Leader. He has to establish and control an effective PA Plan covering Quality Assurance, Reliability, Safety, Materials, EEE Components, Configuration Management.

### 3.2.6 ATHENA Project Scientist

The Project Scientist (PS) in the Italian team of ATHENA is Dr. Claudio Macculi (INAF).

The ATHENA PS is an expert consultant of the ATHENA Italian Science Leader for the performances of the Italian scientific contribution to the mission. His major task is to support the ATHENA Italian Science Leader in the day by day verification of the coherence between the project solutions and the scientific foreseen requirements.

In the Italian team the ATHENA PS also supports the ATHENA Italian Science Leader in defining and monitoring the scientific requirements of the project.

### 3.2.7 ATHENA Science Teams

The ATHENA Science Team is composed of all the Italian scientists involved in the development of the mission and organized in the following groups:

- Athena Science Study Team
- Working Groups and Topical Panels
- X-IFU Science team
- WFI Science team
- Co-Is
- Mission Calibration team

#### 3.2.7.1 Athena Science Study Team

The Athena Science Study Team (ASST) is an ESA-appointed body in charge of advising ESA on the science goals, requirements and all the matter that impact the science-return of Athena. The ASST has organized a community-based structure, based on Science Working Group and Topical Panels, to involve and get feedback from the Athena scientific community. In the ad-interim phase of Athena reformulation, an ad-hoc body, named Science Redefinition Team (SRDT), has been set up by ESA. At the adoption, a new Athena (Science) Study Team will be appointed by ESA. The Italian members are reported here below.

- ASST: L. Piro (INAF), M. Cappi (INAF);
- SRDT: E. Troja (UniRoma2), F. Gastaldello (INAF), D. Spiga (INAF)

### 3.2.7.2 Working Groups and Topical Panels

Science and Mission Working Groups and Topical Panels are part of the community structure created by the ASST to support the science activities throughout specific science studies, simulations, trade-offs.

The Italian members of the Working Groups and of the Topical Panels, including the Italian leads, are reported below.

- Working Group Leads: S. Etti (INAF), M. Cappi (INAF), G. Pareschi (INAF), L. Piro (INAF)
- Topical Panels Leads: A. Comastri (INAF), G. Matt (UniRoma3), S. Sciortino (INAF), L. Piro (INAF), S. Molendi (INAF), F. Fiore (INAF), E. Troja (UniRoma2)

### 3.2.7.3 X-IFU Science Team

The X-IFU Science Advisory team (XSAT) is a body of the XIFU consortium in charge of advising the PI and Co-PIs on science-related matters and to carry out science trade-off analysis.

XSAT is led by Dr. Massimo Cappi (INAF), and includes other Italian scientists as reported below.

- XSAT: M. Cappi (INAF), S. Etti (INAF), P. Mazzotta (UniRoma2), F. Nicastro (INAF), S. Sciortino (INAF)

Participation to these activities is carried out at Italian level by all the scientists involved in the development of the X-IFU instrument.

### 3.2.7.4 WFI Science Team

The WFI Science team is composed by all the Italian scientists involved in the development of the WFI instrument. The WFI team is led by Dr. Andrea Comastri (INAF).

The members of the WFI Science team are reported in Table 5.

*Table 5: the WFI Science team members.*

| Name                       | Function             |
|----------------------------|----------------------|
| Andrea Comastri<br>(INAF)  | WFI Science Leader   |
| Giorgio Lanzuisi<br>(INAF) | Simulation Scientist |
| Fabio Vito<br>(INAF)       | Simulation Scientist |

### 3.2.7.5 Co-Is

The only consortium in the ATHENA mission including Co-Is is the X-IFU one.

The Italian Co-Is of the X-IFU consortium are reported below.

- Italian Co-Is: F. Fiore (INAF), C. Macculi (INAF), S. Molendi (INAF), M. Barbera (UniPA), F. Gatti (UniGE).

### 3.2.7.6 Mission Calibrations

In charge of assessing and improving the uncertainties in the calibrations of Mirrors+instruments and estimating the effect on science results.

The Italian leader of the Mission Calibration is Dr. L. Natalucci (INAF).

### 3.2.8 X-IFU Project Office

The X-IFU PO is in charge of managing and controlling the implementation of the scientific and programmatic requirements by X-IFU Local PO, and supports the X-IFU Co-PI in the verification of their correct programmatic and scientific implementation.

#### 3.2.8.1 X-IFU Project Manager

The X-IFU Project Manager (PM) of the Italian team of X-IFU is Dr. Andrea Argan (INAF).

The deputy X-IFU PM is Dr. Gabriele Minervini (INAF).

The X-IFU PM has day by day responsibility for managing, at Central PO level, the project during its phases to achieve the functional and performance requirements within the approved schedule and budget. The PM directs all the top-level Management activities of the project supported by the Local POs managers. The PM works closely with the X-IFU Co-PI in all aspects of the project that might significantly affect the scientific performance of the Instrument, including cost budget, and calls and chairs the internal review.

#### 3.2.8.2 X-IFU Risk Manager

The X-IFU Risk Manager of the Italian team of X-IFU is Dr. Gabriele Minervini (INAF).

The X-IFU Risk Manager is responsible of the identification and management of all the risk associated to the Italian activities of the X-IFU project. The X-IFU Risk Manager is responsible of the development of the risk register and of its maintenance.

### **3.2.8.3 X-IFU Configuration Manager**

The X-IFU Configuration Manager of the Italian team of X-IFU is Dr. Gabriele Minervini (INAF).

The CADM Manager is responsible for establishing and administering the configuration and data management requirements through co-ordination between the Institutes and the Industrial Contractors. In this capacity it is responsible for establishing new and revised plans and procedures which identify the Configuration Management requirements of this plan to the appropriate supporting elements and for assuring that they are fulfilled in a satisfactory manner.

### **3.2.8.4 X-IFU System Manager**

The X-IFU System Manager (SM) of the Italian team of X-IFU is Dr. Andrea Argan (INAF).

The SM is the responsible at X-IFU PO level for the correct achievement of the System Requirements.

The SM is the leader of the system team and is responsible for the implementation and execution of all system engineering processes. The SM is also the supervisor of the subsystems design development and testing activities. The SM collaborates with the System Managers at Local PO level in order to guarantee the compliance between the system requirements and the related flight model performances. He is the chairman of all the system technical meeting/review.

### **3.2.8.5 X-IFU PA Manager**

The X-IFU Product Assurance Manager figure is covered by Dr. Gabriele Minervini (INAF).

The PA Manager is responsible for the coordination of the PA activities for the whole Italian contribution to the X-IFU project. He has to establish and control an effective PA Plan covering Quality Assurance, Reliability, Safety, Materials, EEE Components.

### **3.2.9 X-IFU Project Scientist**

The X-IFU Project Scientist (PS) in the Italian team of X-IFU is Dr. Claudio Macculi (INAF).

The PS is an expert consultant of the X-IFU Co-PI for the instrument scientific performances. His major task is to support the Co-PI in the day by day verification of the coherence between the project solutions and the scientific foreseen requirements.

In the X-IFU Italian team the PS also supports the X-IFU Co-PI in defining and monitoring the scientific requirements of the project.

### 3.2.10 X-IFU Sub-Systems responsibilities

#### 3.2.10.1 CryoAC detector

The CryoAC detector assembly is under the responsibility of Dr. Claudio Macculi (INAF).

Professor Flavio Gatti (UniGe) is the sub-system scientist and responsible for the procurement and manufacturing of the CryoAC detector.

The members of the CryoAC detector team and their relative responsibilities/roles are listed in Table 6.

*Table 6: the CryoAC detector team members*

| Name                                                         | Function                                                                                      |
|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Claudio Macculi<br>(INAF/IAPS Roma)                          | Responsible for the CryoAC detector assembly                                                  |
| Flavio Gatti<br>(Genova University, Physics dpt.)            | Responsible for the Design and Manufacturing of the CryoAC detector, and Instrument scientist |
| Matteo D'Andrea<br>(INAF/IAPS Roma)                          | Instrument scientist                                                                          |
| Mauro Fiorini<br>(INAF/IASF Milano)                          | Calibration Engineer                                                                          |
| Michela Uslenghi<br>(INAF/IASF Milano)                       | Calibration Scientist                                                                         |
| Giovanni Gallucci<br>(Genova University, Physics dpt.)       | Key Contact person for industrial contract                                                    |
| Manuela Rigano<br>(Genova University, Physics dpt.)          | Local PM/PA and Project controller for the CryoAC production                                  |
| Lorenzo Ferrari Barusso<br>(Genova University, Physics dpt.) | Expert in manufacturing and Instrument scientist                                              |
| Edvige Celasco<br>(Genova University, Physics dpt.)          | Expert in material analysis                                                                   |
| Daniele Grosso<br>(Genova University, Physics dpt.)          | Expert in STM simulation                                                                      |
| Guido Torrioli<br>(CNR/IFN Roma)                             | Expert in SQUID electronics                                                                   |

#### 3.2.10.2 CryoAC Cold FEE

The project of the Cold Front End electronics is under the responsibility of Dr. Guido Torrioli (CNR).

The members of the CryoAC Cold FEE team and their relative responsibilities/roles are listed in Table 7.

### 3.2.10.3 CryoAC Warm Electronics

Dr. Guido Torrioli (CNR) is also in charge for the realization of the Warm Electronics logic and design.

The members of the CryoAC Warm Electronics team and their relative responsibilities/roles are listed in Table 7.

Table 7: the CryoAC Cold FEE and Warm Electronics team members.

| Name                                | Function                                                                        |
|-------------------------------------|---------------------------------------------------------------------------------|
| Guido Torrioli<br>(CNR/IFN Roma)    | Responsible for the realization of the Cold & Warm Electronics logic and design |
| Fabio Chiarello<br>(CNR/IFN Roma)   | Expert in development of algorithm for trigger logic                            |
| Andrea Argan<br>(INAF HQ)           | Expert in design for space electronics                                          |
| Claudio Macculi<br>(INAF/IAPS Roma) | Detector scientist                                                              |
| Matteo D'Andrea<br>(INAF/IAPS Roma) | Detector scientist                                                              |

### 3.2.10.4 ICU

The Management of the ICU project is under the responsibility of Dr. Eduardo Medinaceli Villegas (INAF).

The System Management of the ICU is under the responsibility of Dr. Sebastiano Liori (INAF).

The ICU Project Manager is supported by an Advisor Project Manager, Dr. Luca Valenziano (INAF, former ICU Project Manager).

The members of the ICU team and their relative responsibilities/roles are listed in Table 8.

Table 8: the ICU team members.

| Name               | Function                          |
|--------------------|-----------------------------------|
| Eduardo Medinaceli | ICU Project Manager               |
| Luca Valenziano    | ICU Advisor Project Manager       |
| Sebastiano Liori   | ICU System Manager                |
| Natalia Auricchio  | ICU Project Assurance Manager     |
| Mauro Dadina       | ICU Instrument Scientist          |
| Francesca Sortino  | ICU Configuration Control Manager |
| Leonardo Corcione  | ICU-ASW AIT Manager               |
| Donata Bonino      | ICU-ASW Architecture              |
| Vito Capobianco    | ICU-ASW Engineer                  |

### 3.2.10.5 Thermal Filters

The Management of the X-IFU Thermal Filters project is under the responsibility of Dr. Marco Barbera (UniPa).

The System Management of the X-IFU Thermal Filters is under the responsibility of Dr. Ugo Lo Cicero (INAF).

Dr. Michela Todaro is the local Project Manager, local Risk Manager and local PA Manager of the X-IFU Thermal Filters.

The members of the X-IFU Thermal Filters team and their relative responsibilities/roles are listed in Table 9.

Table 9: the X-IFU Thermal Filters team members.

| Name              | Function                                                                      |
|-------------------|-------------------------------------------------------------------------------|
| Marco Barbera     | X-IFU Thermal Filters Responsible                                             |
| Ugo Lo Cicero     | System Manager                                                                |
| Fabio D'Anca      | Mechanical Engineer                                                           |
| Luisa Sciortino   | Material Scientist                                                            |
| Michela Todaro    | Local Project Manager, local Risk Manager and local Product Assurance Manager |
| Salvatore Varisco | Laboratory Technician                                                         |
| Roberto Candia    | Laboratory Technician                                                         |
| Gaspare Di Cicca  | Laboratory Technician                                                         |

### 3.2.10.6 X-IFU Background Simulations

The background simulations are in charge of the Italian team of X-IFU. Dr. Claudio Macculi (INAF) is the responsible of these studies and of the results.

Dr. Simone Lotti (INAF) is the Instrument Expert in charge of the GEANT4 simulations for the estimation of the background experienced by the X-IFU.

The members of the X-IFU Background Simulation team and their relative responsibilities/roles are listed in Table 10.

Table 10: the X-IFU Background Simulations team members.

| Name                                  | Function                                                                          |
|---------------------------------------|-----------------------------------------------------------------------------------|
| Claudio Macculi<br>(INAF/IAPS Roma)   | Responsible for the particle background simulation of the Athena X-IFU instrument |
| Silvano Molendi<br>(INAF/IAFS Milano) | Particle background scientist                                                     |
| Simone Lotti<br>(INAF/IAPS Roma)      | X-IFU Instrument expert for Geant4 simulation                                     |
| Teresa Mineo<br>(INAF/IAFS Palermo)   | Expert in low energy ray-tracing                                                  |

|                                     |                                                           |
|-------------------------------------|-----------------------------------------------------------|
| Valentina Fioretti<br>(INAF/OAS)    | Optics and magnetic diverter expert for Geant4 simulation |
| Monica Laurenza<br>(INAF/IAPS Roma) | Expert in space particle environment                      |

### 3.2.10.7 X-IFU Ground Segment

The Italian contribution to the X-IFU Ground Segment is under the responsibility of Dr. Fabrizio Fiore and Dr. Fabrizio Nicastro (INAF).

The members of the X-IFU Ground Segment team and their relative responsibilities/roles are listed in Table 11.

*Table 11: the X-IFU Ground Segment team members.*

| Name               | Function                                          |
|--------------------|---------------------------------------------------|
| Fabrizio Fiore     | Scientific coordinator                            |
| Fabrizio Nicastro  | Scientific coordinator                            |
| Simonetta Puccetti | SSDC manager                                      |
| Enrico Piconcelli  | Advanced tools - ideation/ prototyping            |
| Alfredo Luminari   | Advanced tools - ideation/developing prototyping/ |
| Giuseppe Di Lillo  | Advanced tools - ideation/developing/ prototyping |

### 3.2.11 WFI Project Office

The WFI PO is in charge of managing and controlling the implementation of the scientific and programmatic requirements by WFI Local PO.

#### 3.2.11.1 WFI Project Manager

The WFI Project Manager (PM) of the Italian team of WFI is Dr. Andrea Comastri (INAF).

The WFI PM has day by day responsibility for managing, at Central PO level, the project during its phases to achieve the functional and performance requirements within the approved schedule and budget. The PM directs all the top-level Management activities of the project supported by the Local POs managers. The PM works closely with the ATHENA Italian Science Leader in all aspects of the project that might significantly affect the scientific performance of the Instrument, including cost budget, and calls and chairs the internal review.

## 3.2.12 WFI Subsystems

### 3.2.12.1 WFI Optical Filters

The Management of the WFI Optical Filters project is under the responsibility of Dr. Marco Barbera (UniPa).

The System Management of the WFI Optical Filters is under the responsibility of Dr. Ugo Lo Cicero (INAF).

Dr. Michela Todaro is the local Project Manager, local Risk Manager and local PA Manager of the WFI Optical Filters.

The members of the WFI Optical Filters team and their relative responsibilities/roles are listed in Table 12.

*Table 12: the WFI Optical Filters team members.*

| Name              | Function                                                                      |
|-------------------|-------------------------------------------------------------------------------|
| Marco Barbera     | WFI Optical Filters Responsible                                               |
| Ugo Lo Cicero     | System Manager                                                                |
| Fabio D'Anca      | Mechanical Engineer                                                           |
| Luisa Sciortino   | Material Scientist                                                            |
| Michela Todaro    | Local Project Manager, local Risk Manager and local Product Assurance Manager |
| Salvatore Varisco | Laboratory Technician                                                         |
| Roberto Candia    | Laboratory Technician                                                         |
| Gaspare Di Cicca  | Laboratory Technician                                                         |

### 3.2.12.2 WFI Background Simulations

The background simulations are in charge of the Italian team of WFI. Dr. Silvano Molendi (INAF) is the responsible of these studies and of the results.

The members of the WFI Background Simulations team and their relative responsibilities/roles are listed in Table 13.

*Table 13: the WFI Background simulations team members.*

| Name                           | Function              |
|--------------------------------|-----------------------|
| Silvano Molendi<br>(INAF)      | WFI Background Leader |
| Fabio Gastaldello<br>(INAF)    | Background Scientist  |
| Simona Ghizzardi<br>(INAF)     | Background Scientist  |
| Mariachiara Rossetti<br>(INAF) | Background Scientist  |

### 3.2.13 Optics Project Office

The Optics PO is in charge of managing and controlling the implementation of the scientific and programmatic requirements by Optics Local PO, and supports the ATHENA Italian Science Leader in the verification of their correct programmatic and scientific implementation.

#### 3.2.13.1 Optics Project Manager

The Optics Project Manager (PM) of the Italian team of Optics is Dr. Giovanni Pareschi (INAF).

The Optics PM has day by day responsibility for managing, at Central PO level, the project during its phases to achieve the functional and performance requirements within the approved schedule and budget. The PM directs all the top-level Management activities of the project supported by the Local POs managers. The PM works closely with the ATHENA Italian Science Leader in all aspects of the project that might significantly affect the scientific performance of the Instrument, including cost budget, and calls and chairs the internal review.

### 3.2.14 Optics Subsystems

#### 3.2.14.1 Beatrix

The Management of the Beatrix project is under the responsibility of Dr. Bianca Salmaso (INAF).

The members of the Beatrix team and their relative responsibilities/roles are listed in Table 14.

Table 14: the Beatrix team members.

| Name                                | Function                                                   |
|-------------------------------------|------------------------------------------------------------|
| Gianpiero Tagliaferri (INAF-OAB)    | Project Leader                                             |
| Giovanni Pareschi (INAF-OAB)        | Deputy Project Leader                                      |
| Bianca Salmaso (INAF-OAB)           | Program manager & System Engineer                          |
| Stefano Basso (INAF-OAB)            | AIT & AIV Executive Manager                                |
| Daniele Spiga (INAF-OAB)            | Optical Design and calibration                             |
| Mauro Ghigo (INAF-OAB)              | Vacuum System, Polishing and figuring and control software |
| Gabriele Vecchi (INAF-OAB)          | Polishing and figuring                                     |
| Giorgia Sironi (INAF-OAB)           | Metrology                                                  |
| Vincenzo Cotroneo (INAF-OAB)        | Figuring                                                   |
| Davide Sisana (POLIMI)              | PhD student                                                |
| Andrea Bianco (INAF-OAB)            | Clean environment                                          |
| Rachele Millul (INAF-OAB)           | Project Controller                                         |
| Roberto Moncalvi (INAF-OAB)         | Contracts Officer                                          |
| Claudio Ferrari (IMEM-CNR)          | Crystals                                                   |
| Andrea Zappettini (IMEM-CNR)        | Crystals                                                   |
| Vadim Burwitz (MPE)                 | Validation                                                 |
| Manuel Sanchez del Rio (ESRF)       | Crystals                                                   |
| Michela Uslenghi (INAF-IASF)        | Detectors                                                  |
| Mauro Fiorini (INAF-IASF)           | Electronics                                                |
| Finn Christensen (DTU)              | External advisor                                           |
| Desiree Della Monica Ferreira (DTU) | Coating                                                    |
| Sonny Massahi (DTU)                 | Coating                                                    |

### 3.2.14.2 Vert-X

The Management of the Vert-X project is under the responsibility of Dr. Alberto Moretti (INAF).

The members of the Vert-X team and their relative responsibilities/roles are listed in Table 15.

*Table 15: the Vert-x team members.*

| Name                        | Function                       |
|-----------------------------|--------------------------------|
| Alberto Moretti<br>(INAF)   | PM and Facility Science Leader |
| Stefano Basso<br>(INAF)     | Responsible of integration     |
| Daniele Spiga<br>(INAF)     | Responsible of test            |
| Giorgia Sironi<br>(INAF)    | System engineer                |
| Giovanni Pareschi<br>(INAF) | Senior Advisor                 |

## 4 Product Breakdown Structure (PBS)

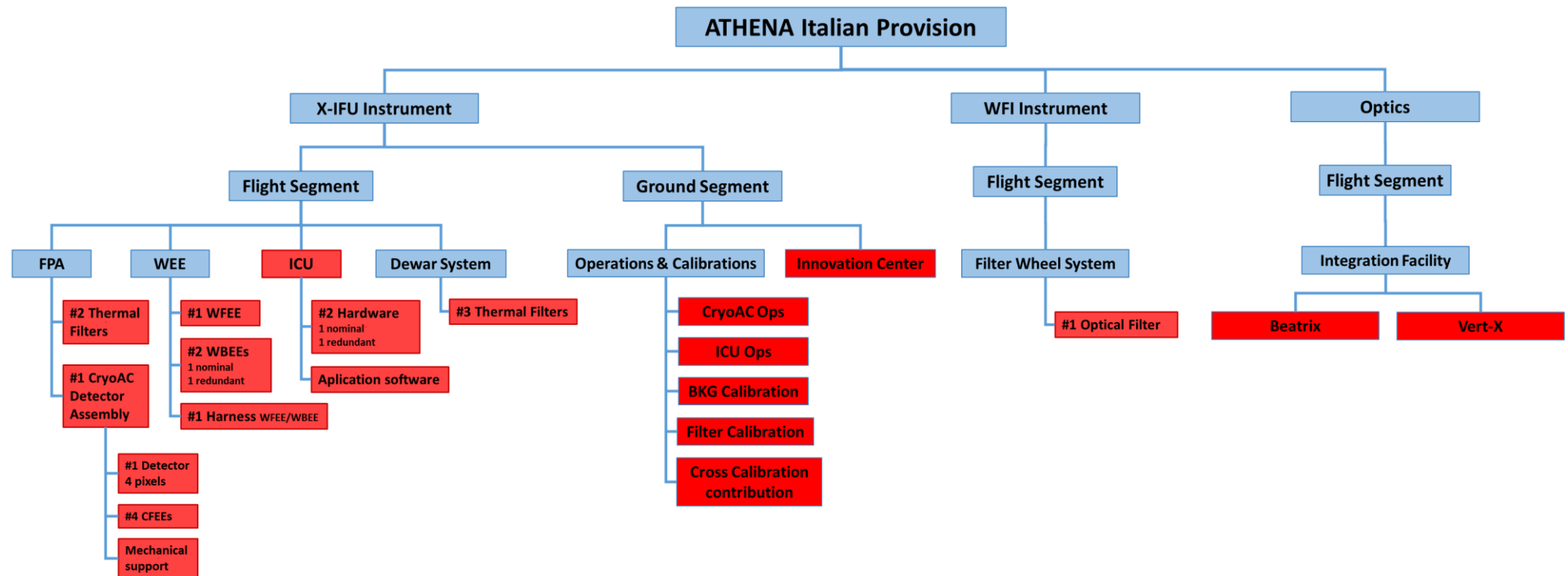


Figure 2: the Product Breakdown Structure (PBS) of the Italian team activities in the X-IFU Consortium. Red boxes: items under the Italian responsibility.

## 5 Work Breakdown Structure (WBS)

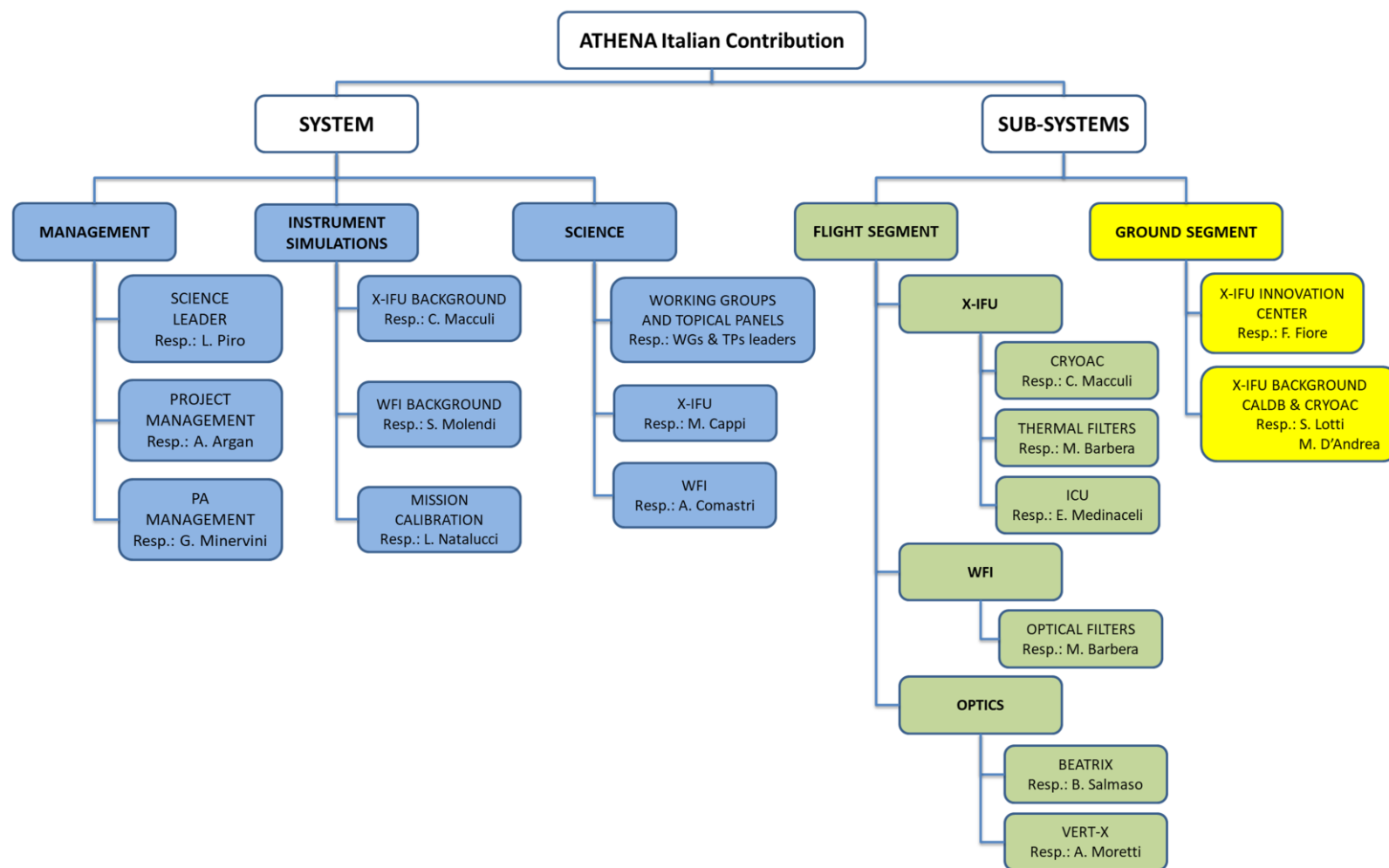


Figure 3: the Work Breakdown Structure (WBS) of the Italian team activities in the ATHENA Mission

## 6 Schedule and Management Control

INAF will take the full responsibility for provision of all schedule data.

The ATHENA master schedule is defined and maintained by ESA, at the current level of content and detail, of the main activities and milestones.

A coherent set of schedule techniques will be used to allow easy transferring and integration of schedule files in the overall project bar chart and ensure common control, analysis methodology and reporting.

## 7 Cost Management

The objective of Cost Management is to ensure a rapid assessment of proposed payment profiles, of actual expenditures, and of risks and deviations. Furthermore, it facilitates the prediction of potential deviations, and the definition and implementation of corrective actions to avoid cost overruns. It also provides the forecasting of future incomes and expenses to support budget and cash flow planning and ensures the visibility on the current project commitments.

In conjunction with Schedule Management, it provides the means to harmonize the schedule planning and the cost plans for accurate time phasing of costs and resources.

## 8 Configuration Management

The Italian Project Managers will contribute to define the Configuration and Data Management (CADM) program and procedures that will be applied to the development of the items under the Italian responsibility.

The CADM program, applied during the different project phases, will include rules and procedures for:

- Identification revision and control of the Project documentation
- Systematic management of Project data and control of documents distribution and delivery
- Progressive review and release of all drawings and Project documentation in accordance with the Project Requirements and established baseline
- Change control and processing of the change documentation
- Maintenance, throughout the Project life cycle, of the configuration status accounting for each Configuration Item and all configured parts that are under Italian responsibility
- Support for document preparation, identification and control
- Data and document receipt and registration
- Data maintenance, storage, retrieval distribution and exchange.

## 8.1 Documentation Management

The Documentation Management, applied to the development of the items under the Italian responsibility, establishes and operates a centralized documentation system which provides the organization and procedures for receiving, identification, control, releasing, recording, distribution, maintenance and storage of all documentation issued and used during the life cycle of the program.

The system includes:

- the identification and releasing of the program documentation
- the correct recording, maintenance of the information and their accessibility
- the distribution of all documentation in timely manner
- maintenance of files of the program documentation such as plans, specifications, procedures, reports, etc, in limited access archives.

For the X-IFU Italian contribution, the CADM Plan has been defined by the X-IFU Italian Management Plan document (XIFU-INAF-SYS-PL-0001-r02) [RD2]

For all the ATHENA documents produced by the Italian contribution, the rules reported below will be applied.

A Document Number combined with an Issue Number will be used for tagging the ATHENA documents prepared by the Italian team as the unique identifier. The Document Number shall be “category” based and each section of the number shall be separated with the “-” character.

Document Number shall be built up in the following way:

| Position | Code   | Description/ Example                                    |
|----------|--------|---------------------------------------------------------|
| 1-6      | ATHENA | Advanced Telescope for High Energy Astrophysics (fixed) |
| 5-8      | iiii   | Institutes (INAF, CNRF, UNPA, UNGE)                     |
| 9-11     | yyy    | Document Category                                       |
| 12-13    | tt     | Document Type code (e.g. TN=Tech. Note)                 |
| 14-17    | xxxx   | Sequential number                                       |
| 18-19    | ikk    | Issue number                                            |

Therefore, a full example of the Document Number will be:  
ATHENA-iiii-yyy-tt-xxxx-ikk

“iiii” identifies the Italian institutes responsible of the document:

|      |                                                                          |
|------|--------------------------------------------------------------------------|
| INAF | Istituto Nazionale di Astrofisica                                        |
| CNRF | Consiglio Nazionale delle Ricerche istituto di Fotonica e nanotecnologie |
| UNPA | University of Palermo                                                    |
| UNGE | University of Genova                                                     |

“yyy” identifies the Document Category:

|     |                           |
|-----|---------------------------|
| MNG | Management                |
| SYS | System                    |
| GND | Ground Segment            |
| CRA | Cryogenic AntiCoincidence |
| THF | Thermal Filters           |

ICU     Instrument Control Unit  
CFE     Cold Front Ends  
WFE     Warm Front Ends  
WBE     Warm Back Ends  
WEE     Warm Electronics  
BKG     Background

“tt” identifies the type of the Document Code:

CP     Change Proposal  
CR     Change Request  
CS     Configuration Status List  
DC     Document Change Notice  
DP     Data Package  
DS     Design Specification  
DV     Development and Verification Plan  
DW     Drawing/Diagram  
EI     EI - Experiment Interface Document  
HM     Hardware/Software Matrix  
HO     Handout/Presentation  
IS     Interface Specification / ICD  
LI     List (materials, components, parts, processes)  
MD     Model (3D model/ mechanical model/ mathematical model/ CAD model)  
MN     Minutes of Meeting  
NC     Non-Conformance Report  
PA     Product Assurance  
PL     Plan  
PO     Proposal  
PR     Procedure  
PT     Product Tree  
RD     Request for Deviation  
RP     Report  
RS     Requirement Specifications  
RW     Request for Waiver  
SC     Schedule  
SS     Scientific Specifications  
SW     Statement of work  
TN     Technical Note  
TP     Test Procedure  
TR     Test Reports  
TS     Test Specification  
VP     Verification Plan  
VR     Verification Report  
WB     Work Breakdown Structure

“xxxx” identifies the Sequential number:

0001-9999

For each type of Document Code, 9999 document numbers can be assigned.

“ikk” identifies the issue number:

i01-i99

## 9 Risk Management

The Italian Risk Managers will implement a Risk Management Process to manage and control the risk associated to the X-IFU Instrument project in accordance with the ESA standard ECSS-M-ST-80C

The objective of the risk management is to identify all risks and to keep them within defined and acceptable boundaries.

The process will be defined in the Risk Management Plan, accompanied by the first iteration of the risk register identifying the main risks that threaten the successful completion of the Implementation Phase, in particular where it affects the technology readiness, the development schedule and cost.

In all the Local Project Offices, the responsibility for the identification and management of risk is taken over by the Project Managers who supervise the application of the correct methodology and take in charge the maintenance of the risk register.

The Risk Management is a systematic process that will be applied since the beginning and along the whole life cycle of the project.

The identified risks will be analyzed in order to evaluate alternative solutions and ensure awareness at all level and elements of the project. The Risk Managers will control risks and establish plans for contingencies, to be managed at designated levels of hierarchy. The risks will be monitored and contingency plans put into action.

## 10 Appendix - Project Key-Person CVs

- **Luigi Piro**

|                                                                                                                                                                            |                                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Dr. Luigi PIRO</b></p> <p>INAF-IAPS</p> <p>Via del Fosso del Cavaliere 100, Rome, Italy</p> <p>Tel: +39 06 49934007</p> <p>Fax:</p> <p>Email: luigi.piro@inaf.it</p> | <p><b>Role in the Italian participation in the ATHENA project</b></p> <p><b>ATHENA Italian Science Leader</b></p> <p><b>X-IFU Co-PI</b></p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|

### Experience/Education

Degree in Physics, University of Rome La Sapienza, Italy.

Key scientific field: high energy astronomy, with particular regard to AGNs, GRBs and multi-messenger astronomy, and the development of novel detectors based on X-ray superconducting transition (TES microcalorimeters). My other original results include high-z GRBs, the use of GRBs as beacons for WHIM studies, ultralong GRBs, afterglows from on axis and off-axis jets, the discovery of the X-ray counterpart of GW170817 and studies of the counterparts to GW mergers.

Published 280 refereed papers (h-index 62) with a total of about 20.000 citations

Given 80 invited reviews in international conferences

Organized 55 scientific international conferences in the field.

1998: awarded with the Bruno Rossi Prize by the American Astronomical Society

2002: the Descartes Prize of the European Commission.

### Previous Project Participations / Responsibilities

Coordinator of a H2020 infrastructure program on high energy astrophysics (AHEAD2020, previously AHEAD)

Project Scientist for the Italian Space Agency of the Italian-Dutch X-ray satellite BeppoSAX

### Professional Appointments and Affiliations

Since 2002 - Director of Research at INAF

1989-1991: As visiting scientist in Japan, I discovered the reflection component in AGN with the GINGA satellite.

Invited in several advisory boards by ESA, NASA, ASI, JAXA and CAS.

- **Andrea Argan**

|                                                                                                                                                                                           |                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Dr. Andrea ARGAN</b></p><br><p>INAF-Headquarter</p> <p>Viale del Parco Mellini 84, 00136 Rome, Italy</p> <p>Tel: +39 06 35533290</p> <p>Fax:</p> <p>Email: andrea.argan@inaf.it</p> | <p><b>Role in the Italian participation in the ATHENA project</b></p><br><br><p style="text-align: center;"><b>ATHENA Italian Project Manager</b></p> <p style="text-align: center;"><b>X-IFU Italian Project and System Manager</b></p> |
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| <b>Experience/Education</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <p>Degree in Electronic Engineering, University of Naples, Italy (110/110 cum laude).</p> <p>Fellowship on Particle Accelerator Technologies, Istituto Nazionale di Fisica Nucleare (INFN), Laboratori Nazionali di Frascati (LNF).</p>                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Previous Project Participations / Responsibilities</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <p>Project manager of the Italian participation to the ATHENA mission</p> <p>Payload Manager of the AGILE satellite</p> <p>AIV Manager of the AGILE satellite</p> <p>Responsible for the Payload Data Handling Unit on the AGILE satellite</p> <p>Instrument Manager of the SIMBOL-X mission</p> <p>System Manager of the NHXM mission</p> <p>Member of the LOFT System Team</p>                                                                                                                                                                                                                                             |
| <b>Professional Appointments and Affiliations</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <p>March 2000 - Feb. 2002: Research grant, Consorzio Interuniversitario per la Fisica Spaziale (CIFS), Italy.</p> <p>March 2002 - Nov. 2004: Research staff member at the Istituto Fisica Cosmica, CNR, Milan.</p> <p>Dec. 2004 - Apr. 2008: First Technologist, staff member at the Istituto di Astrofisica Spaziale e Fisica Cosmica (IASF), CNR (INAF since Jan 2005), Rome.</p> <p>Since May 2008: First Technologist, permanent staff member at the Project Department (now Scientific Directorate), INAF-Headquarter, Rome.</p> <p>Since 2018, responsible for the Chief Engineering Office – Space-based projects</p> |

• **Marco Barbera**

|                                                                                                                                                                                                                                           |                                                                                                                                                                                     |
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| <p><b>Prof. Marco Barbera</b></p> <p>Università degli Studi di Palermo (UNIPA)</p> <p>Dipartimento di Fisica e Chimica</p> <p>Via Archirafi 36, 90123 Palermo, Italy</p> <p>Tel: +39 091 233613</p> <p>E-mail: marco.barbera@unipa.it</p> | <p><b>Role in the Italian participation in the ATHENA project</b></p> <p><b>Responsible for the X-IFU Thermal Filters</b></p> <p><b>Responsible for the WFI Optical Filters</b></p> |
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| Experience/Education                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| 1995 - PhD. in Physics, Università degli Studi di Palermo, Italy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 1991 - M.S. degree in Physics, Università degli Studi di Palermo, Italy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Previous Project Participations / Responsibilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>- Responsible for the design, development and calibration of the thermal filters of the X-Ray Integral Field Unit (X-IFU), and the optical blocking filter of the Wide Field Imager (WFI) detectors on board ATHENA.</li> <li>- Responsible of the Research Unit UNIPA-DiFC in the project H2020-INFRAIA-2014-2015 entitled "Integrated Activities for the High Energy Astrophysics Domain (AHEAD)" (No. 654215).</li> <li>- Responsible of the Research Unit UNIPA-DiFC in the project TECNO-INAF 2012 entitled: "Improvement of the angular resolution of glass/plastic thin-foil X-ray mirrors for large area telescopes via active control (AXYOM)".</li> <li>- Responsible for the design of the optical filters of the experiment LAD on-board the LOFT mission (selected by ESA for the M3 mission feasibility study within Cosmic Vision, down selected in the final round).</li> <li>- Responsible of the Research Unit UNIPA-DiFC in the project FP7-SPACE-2010-1 entitled "Cryogenic Electronics for Space Applications and Research (CESAR)" (No. 263455).</li> <li>- Responsible at the XACT facility INAF-OAPA for the calibration program of the detector named Lunar Orbital X-ray Fluorescence Imaging Spectrometer (LOXIA) of the Chinese Mission Chang'E-1 (in orbit from October 2007 to March 2009).</li> <li>- Responsible at the XACT facility INAF-OAPA for the calibration program of the filters of the X-ray Telescope (XRT) on board the Hinode solar mission (in orbit since September 2006).</li> <li>- Responsible of the Research Unit INAF-OAPA in PRIN-MIUR 2004 project entitled "Development and characterization of optics for X-Ray Astronomy with single and multilayer reflective coatings".</li> <li>- Scientific coordinator of a project for the upgrade of XACT facility at INAF-OAPA funded by PON 2000-2006 "Ricerca Scientifica, Sviluppo Tecnologico ed Alta Formazione", Asse II, Misura II, azione 1.</li> <li>- Co-I of research programs funded by NASA for the development and application of Germanium NTD microcalorimeters (NRA00-OSS-01, NRA01-OSS-01), and for the development of optical grazing incidence X-ray optics (NRA00-OSS-01, NRA01-HEA-01).</li> <li>- Co-I of two biennial programs PRIN-MIUR 1999 and PRIN-MIUR 2001 for the development and application of cryogenic X-ray microcalorimeters.</li> <li>- Responsible for the design and implementation of a Adiabatic Demagnetization Refrigerator (ADR) at INAF-OAPA to start a development and testing program of cryogenic X-ray microcalorimeters.</li> <li>- Collaborator in the design and construction of the X-ray Astronomy Calibration and Testing (XACT)</li> </ul> |

facility at INAF - Osservatorio Astronomico di Palermo G.S. Vaiana (OAPA), Palermo, Italy

**Professional Appointments and Affiliations**

- Since Dec. 2004 Associate professor of Astronomy and Astrophysics at UNIPA, Palermo, Italy
- Sept. 1997 - Sept. 1998 Visiting Scientist at the Center for Astrophysics, Cambridge (MA), USA.  
Participation to the development of Ge NTD X-ray micro-calorimeters.
- March 1997 - May 1997 Visiting Scientist at the Marshall Space Flight Center, Huntsville (AL), USA.  
Participation in the end-to-end calibration of the Chandra space observatory.
- Jul. 1995 - Dec. 2004 Research Astronomer at INAF - Osservatorio Astronomico di Palermo G.S. Vaiana, Palermo, Italy
- Dec. 1993 - June 1994 Research fellow at the Center for Astrophysics, Cambridge (MA), USA  
Member of the High Resolution Camera instrument team of the Chandra space observatory

- **Massimo Cappi**

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| <p><b>Dr. Massimo Cappi</b></p> <p>INAF-Headquarter</p> <p>Viale del Parco Mellini 84, 00136 Rome, Italy</p> <p>Tel: +39 3383375563</p> <p>Fax:</p> <p>Email: massimo.cappi@inaf.it</p> | <p><b>Role in the Italian participation in the ATHENA project</b></p> <p><b>Chair of the X-IFU Science Advisory Team (XSAT)</b></p> <p><b>Chair of the Athena Science Working Group 2<br/>(Energetic Universe)</b></p> |
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| Experience/Education                                                                                                                                                                                 |
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| 1998: Ph.D., Astrophysics, University of Saitama, Faculty of Science and Engineering, Japan                                                                                                          |
| 1993: Laurea Doctoral degree (110/110 with honours) in Astronomy, University of Bologna, Faculty of Astronomy                                                                                        |
| Previous Project Participations / Responsibilities                                                                                                                                                   |
| Previous ESA-appointed member of the ASST                                                                                                                                                            |
| Previous member of XMM ESA-appointed User's group, and member of the EPIC consortium                                                                                                                 |
| Member of the ESA Astronomy Working Group (since 2019)                                                                                                                                               |
| Member of Time Allocation Committees for Chandra, XMM-Newton, and Suzaku (regularly since 2007).                                                                                                     |
| PI and Co-I in numerous (>100) observation proposals (for ASCA, XMM, Chandra, Suzaku, BeppoSAX, Integral, TNG, VLT, Loiano, ecc.)                                                                    |
| Professional Appointments and Affiliations                                                                                                                                                           |
| INAF Science Directorate/Head of the High Energy Division (UTG III) (since September 2017)                                                                                                           |
| Permanent Associate Researcher at the INAF/Observatory for Astrophysics and Space Research (OAS), Bologna (Research fellow since 1997)                                                               |
| Smithsonian Visiting Scientist, Harvard- Smithsonian Center for Astrophysics, USA (June 1999-Dec. 1999)                                                                                              |
| European Union & Science and Technology Agency (STA) of Japan Post-Doctoral Fellow at The Institute of Physical and Chemical Research (RIKEN), X-ray Astronomy Group, Japan, (April 1994-April 1996) |
| European TMP Fellow at the MPE, Garching bei München, Germany, (January-March 1994)                                                                                                                  |

- **Andrea Comastri**

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| <p><b>Dr. Andrea COMASTRI</b></p> <p>INAF-Osservatorio di Astrofisica e Scienza dello Spazio di Bologna</p> <p>Via Gobetti 93/3, 40129 Bologna, Italy</p> <p>Tel: +39 051 6357357</p> <p>Mob: +39 340 5889236</p> <p>Email: andrea.comastri@inaf.it</p> | <p><b>Role in the Italian participation in the ATHENA project</b></p> <p><b>ATHENA WFI Team Italian Representative</b></p> <p><b>Chair Topical Panel Science Working Group 2.1:</b></p> <p><b>X-ray Surveys and high-redshift AGN</b></p> |
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| <b>Experience/Education</b>                                                                                                                                                                                                                                                                            |
| <p>Degree in Astronomy , Bologna University, Italy (110/110 cum laude).</p> <p>PhD in Astrophysics, Bologna University</p> <p>Post Doc Fellowship at MPE Germany. Visiting Scientist at CfA Cambridge (USA), Riken (Japan), Caltech (USA), MPE (Germany)</p>                                           |
| <b>Previous Project Participations / Responsibilities</b>                                                                                                                                                                                                                                              |
| <p>Member of the ATHENA WFI Science Team and Consortium Board</p> <p>Italian representative of the WFI consortium in ATHENA.</p> <p>Chair of the ATHENA Science Working Group on X-ray Surveys and high-z AGN.</p> <p>Member of the NASA/NuStar Science Team.</p> <p>Member of the XMM User Group.</p> |
| <b>Professional Appointments and Affiliations</b>                                                                                                                                                                                                                                                      |
| <p><b><u>2018-Date: Director INAF–Astrophysics and Space Science Observatory of Bologna (OAS)</u></b></p>                                                                                                                                                                                              |
| <p><u>2016-Date: Senior Astronomer at INAF</u></p>                                                                                                                                                                                                                                                     |
| <p><b><u>2015-2017: Director INAF-Bologna Astronomical Observatory (OABO)</u></b></p>                                                                                                                                                                                                                  |
| <p><u>2003-2016 Associate Astronomer INAF Bologna Observatory</u></p>                                                                                                                                                                                                                                  |
| <p><u>1994-2003 Astronomer INAF Bologna Observatory</u></p>                                                                                                                                                                                                                                            |

## • Sebastiano Ligori

| Dr. Sebastiano Ligori                                                                                                                                                                                                              | Role in the Italian participation in the ATHENA project |
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| <p>INAF-Oss. Astrofisico di Torino</p> <p>Via Osservatorio 20, 10025 Pino Torinese</p> <p>Tel: +39 0118101964</p> <p>Fax: +390118101930</p> <p>Email: <a href="mailto:sebastiano.ligori@inaf.it">sebastiano.ligori@inaf.it</a></p> | <p><b>X-IFU ICU System Manager</b></p>                  |

### Experience/Education

Master degree (1992 - Vote: 109/110) in Physics at Turin University

Ph.D. in Astronomy (1996) "Circumstellar environments observed by means of stellar coronagraphy"

Research astronomer at OA Torino

### Previous Project Participations / Responsibilities

Data reduction of IR astronomical images

Stellar coronagraphy with the STScI/OATo coronagraph at Calar Alto

Detector specialist at Max Planck Institut for Astronomy for the Mid-IR Interferometric instrument (MIDI) at the VLT Interferometer

Member of the Scientific Council of the European Optical Interferometry Initiative

ICU Application SW responsible for the NISP instrument of the Euclid mission

### Professional Appointments and Affiliations

- 1996 –1998 – Network Manager, Cluster Reply S.r.l.
- 1998-2004 – Researcher at Max Planck Institut for Astronomy, Heidelberg, Germany
- 2004 - present: INAF – Osservatorio di Torino

## • Ugo Lo Cicero

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| <p><b>Dr. Ugo Lo Cicero</b></p> <p>INAF – Osservatorio Astronomico di Palermo</p> <p>Tel: +39 091233621</p> <p>Fax:</p> <p>Email: <a href="mailto:ugo.locicero@inaf.it">ugo.locicero@inaf.it</a></p> | <p><b>Role in the Italian participation in the ATHENA project</b></p> <p><b>X-IFU Thermal Filters System Manager</b></p> <p><b>WFI Optical Filters System Manager</b></p> |
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| Experience/Education                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| <p>Ph.D. in Electronic and Telecommunication Engineering, Università degli Studi di Palermo, Italy.</p> <p>Visiting Ph.D. student at Harvard/Smithsonian Center for Astrophysics, Cambridge (MA), USA.</p> <p>Master's Degree in Electronic Engineering, Università degli Studi di Palermo, Italy (110/110 cum laude).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Previous Project Participations / Responsibilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <ul style="list-style-type: none"> <li>• Responsible for the "LAD filters study" work-package within the ASI-INAF contract 2018-19-HH.0 supporting the Phase A activities of the eXTP Chinese-European space mission.</li> <li>• Athena X-IFU instrument consortium member and participation to management, design, development, and characterization activities of the Thermal Filters team.</li> <li>• Responsible for the Microtechnologies laboratory and the Cryogenics laboratory at INAF – Osservatorio astronomico di Palermo.</li> <li>• Project office and project management support for ASI-INAF contract I/022/12/0 for EChO Mission Assessment Phase.</li> <li>• Participation to the Tecno-INAF project AXIOM (Improvement of the angular resolution of glass/plastic thin-foil mirrors for large area X-ray telescopes via active control).</li> <li>• Participation to analysis, characterization and testing activities of the ASI contract N. I/032/10/0 "XMM-Newton/EPIC on-board maintenance".</li> <li>• Participation to the FP7-SPACE-2010-1 project "Cryogenic Electronics for Space Applications and Research (CESAR)".</li> <li>• Participation to the PO FESR Sicilia 2007/2013 4.1.1.1 project FAE - Fotovoltaico ad Alta Efficienza (High efficiency photovoltaics).</li> <li>• Participation to the Tecno-INAF project "Read-out electronics for NTD germanium X-ray microcalorimeter arrays".</li> </ul> |
| Professional Appointments and Affiliations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <p>Since November 2009 – Technologist, permanent staff member at INAF – Osservatorio astronomico di Palermo.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

• **Simone Lotti**

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| <p><b>Dr. Simone Lotti</b></p><br><br><p>INAF-Rome</p> <p>Via Fosso del Cavaliere 100, Rome, Italy</p> <p>Tel: +39 0649934690</p> <p>Fax:</p> <p>Email: <a href="mailto:simone.lotti@inaf.it">simone.lotti@inaf.it</a></p> | <p><b>Role in the Italian participation in the ATHENA project</b></p><br><br><br><br><br><p style="text-align: center;"><b>X-IFU Italian Instrument expert</b></p> |
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**Experience/Education**

Master degree (2009/07/16 - Vote: 110/110) in Astronomy and Astrophysics at Università degli Studi di Roma "La Sapienza".

Astronomy Ph.D. (2013/01/21) - XXV Astronomy Ph.D. in "La Sapienza" in Roma

Title: "Performance estimates and design optimization of space-based instruments for X-Ray astrophysics"

Researcher at INAF/IAPS Roma

**Previous Project Participations / Responsibilities**

X-IFU instrument expert, in charge of the GEANT4 simulations for the estimation of the background experienced by the X-IFU.

AHEAD Work Package 7.2 leader

AHEAD 2020 Work Packages 9.3a, 9.3c member

AHEAD 2020 Work Packages 13 e 14 leader

AREMBES Deputy project scientist, Work Packages 3, 3.4 e 7.5 coordinator, WP 8 member

EXACRAD Project scientist, Work Packages 6.2, 8.2 e 9.2 leader, Work Package 1 member

Athena X-IFU Performance Working Group member

Athena X-IFU Calibration Team member

Athena X-IFU Consortium member

Athena Mission Working Group 5.2 (Background) member

Athena Mission Working Group 5.3 (Inter-calibrations) member

NuSTAR science team member

NuSTAR Galactic plane survey team member

NuSTAR Galactic binaries team member

MAINSTREAM project (characterizing the background of present and future X-Ray missions) member  
PNRR project “NATIONAL CENTRE FOR HPC, BIG DATA AND QUANTUM COMPUTING”, Spoke 2, WP6 member

#### **Professional Appointments and Affiliations**

- 1/6/2010 –31/5/2012 - INAF: Research Grant
- 2/7/2012 –1/7/2013 - INAF: Research Fellowship
- 4/11/2013 – 3/11/2014 - INAF: Research Grant
- 2/3/2015 – 29/11/2018 - INAF: Researcher
- 30/11/2018 – 1/1/2023 – INAF: Permanent staff

• **Claudio Macculi**

| Dr. Claudio Macculi                                                                                                                           | Role in the Italian participation in the ATHENA project                                                                           |
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| <p>INAF-Rome</p> <p>Via Fosso del cavaliere 100, Rome, Italy</p> <p>Tel: +39 0649934658</p> <p>Fax:</p> <p>Email: claudio.macculi@inaf.it</p> | <p><b>ATHENA Italian Project Scientist</b></p> <p><b>X-IFU Italian Project Scientist</b></p> <p><b>CryoAC Project Manager</b></p> |

**Experience/Education**

- 2003: PhD in Physics at the Bologna University "Alma Mater Studiorum"
- 1999: Degree in Physics at the Roma University "La Sapienza"

**Previous Project Participations / Responsibilities**

**Since 2006 at INAF/IAPS Roma:**

- Testing activity on X-ray TES cryogenic microcalorimeters
- Testing activity on cryogenic readout electronics for TES array
- Responsible for the x-ray cryogenic lab activity at INAF/IAPS Roma
- WP leader in ESA and ASI project related to space missions as IXO/ATHENA, SPICA and in Research and Development projects on detector and readout electronics topics
- Project Manager of the AREMBES project (ESA competitive tender)
- Appointed member of the ATHENA X-IFU System Team (coordination of the related anticoincidence detector and particle background topics activity)
- Project Scientist of the cryogenic anticoincidence TES-based for the ATHENA X-IFU
- Member of the Working Group, appointed by the INAF/IAPS institute director, for the Technology Transfer activity of the Research Area of Roma Tor Vergata
- Guest Editor for Experimental Astronomy
- Referee for international research projects

**From 2000 to 2006 at INAF/IASF Bologna (now INAF/OAS Bologna)**

Study, design and development of space missions:

- Contribution to SPORt programme (microwave polarimetry) selected by ESA and approved by ASI to be lodged at the International Space Station. Role: thermal analysis (warm and cryogenic environment), and testing on instrument breadboard (at Alenia Aerospazio Divisione Spazio oggi TAS-I, Torino) and on cryocooler (Mechanical Systems Laboratori at ESA-ESTEC)

Experiments on board of stratospheric Balloons:

- design, development and test of a 32 GHz polarimeter called "BaR-SPORt", experiment approved by ASI
- sub-systems testing in thermo-vacuum chamber (solar panels, and telemetry system)
- Contribution to a proposal towards ASI, and design and test of a platform to manage a solar cell power module and telemetry system in real-time

Microwaves:

- Development and validation of a radiation-matter interaction model between polarized and unpolarized radiation and isotropic dielectrics (Applied Optics publication)

Cryogenics:

- Thermal design and test of a cryostat to cool down to 60 K a microwave polarimeter

- **Author and Co-author of papers on peer reviewed international journals, conference proceedings, technical reports delivered to ESA and ASI**
  - **Referee for International Journal of Infrared and Millimeter Waves, and Journal of low Temperature Physics.**
- Talks on TES detector, cryogenics, microwave optics at national and international conferences.**

#### **Professional Appointments and Affiliations**

January 2000 – January 2006 Research fellowship at CNR/ITeSRE Bologna, INAF/IASF Bologna

June 2006 – April 2008 Research fellowship at INAF/IASF Roma (now INAF/IAPS)

May 2008 – December 2012 – Staff member at INAF/IASF Roma, then INAF/IAPS.

January 2013 – Permanent staff member at INAF/IAPS

## • Eduardo Medinaceli Villegas

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| <b>Dr. Eduardo Medinaceli Villegas</b><br><br>INAF-Bologna<br>Via Piero Gobetti 101, 40129 Bologna<br>Tel: +39 051 639 8698<br>Fax:<br>Email: eduardo.medinaceli@inaf.it | <b>Role in the Italian participation in the ATHENA project</b><br><br><p style="text-align: center;"><b>X-IFU ICU Project Manager</b></p> |
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### Experience/Education

Master degree (2002) in Physics at University UMSA, La Paz, Bolivia

Ph.D. in Physics (2008) - University of Bologna

Research Fellowship at INFN – Sez. di Bologna e Sez. di Padova

Researcher at INAF/OAS Bologna

### Previous Project Participations / Responsibilities

ESA Euclid Mission (2016-currently): Since 2019 manager for the Data Processing Unit's Application Software of the NISP instrument; since 2021 part of the NISP on-board software support team, instrument expertise support team, instrument health assessment team, instrument Detector Team, and Instrument Operations Team.

Germanium Detector Array – GERDA (2014-2015), neutrino experiment: study of the performances of the Germanium detector type Broad Energy Germanium or Point Contact in the background rejection using a Compton spectrometer.

**Oscillation Project with Emulsion-tRacking Apparatus – OPERA (2009-2013)**, neutrino experiment: co-responsible of the scientific activities of the consortium Bologna-Padova.

Cosmic Rays studies – SLIM and CAKE experiments (2005-2008): Astroparticle Physics with Nuclear Track Detectors.

### Professional Appointments and Affiliations

- 2021 – in itinere – Researcher at INAF - Osservatorio di Astrofisica e Scienza dello Spazio
- 2016 - 2020 – Research fellowship at INAF – OAPd e OAS
- 2009 - 2015 – Research fellowship at INFN – Sezioni di Bologna e Padova
- 2004 - 2008 – University of Bologna, Physics Department

• **Gabriele Minervini**

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| <p><b>Dr. Gabriele Minervini</b></p><br><p>INAF-Headquarter</p> <p>Viale del Parco Mellini 84, 00136 Rome, Italy</p> <p>Tel: +39 0649934656</p> <p>Fax:</p> <p>Email: gabriele.minervini@inaf.it</p> | <p><b>Role in the Italian participation in the ATHENA project</b></p><br><br><p><b>ATHENA Italian deputy Project Manager</b></p> <p><b>ATHENA Italian Product Assurance Manager</b></p> <p><b>X-IFU Italian deputy Project Manager</b></p> <p><b>X-IFU Italian Risk Manager</b></p> <p><b>X-IFU Italian Configuration Manager</b></p> <p><b>X-IFU Italian Project Controller</b></p> |
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**Experience/Education**

PhD in Engineer at the International University UNINETTUNO.

II Level Master in professional studies in "Science and Technology of Space" at the University of Rome "Tor Vergata".

Degree in Physics at the University of Napoli "Federico II".

**Previous Project Participations / Responsibilities**

OHB: System Engineer for the PRISMA mission.

INAF and CIFS: researcher in the AGILE satellite team.

INAF: Deputy Project Manager, Product Assurance Manager, Risk Manager, Configuration Manager, Project Controller of the Italian participation in the X-IFU consortium of the ATHENA mission.

INAF: Product Assurance Manager of the Italian participation in the eXTP mission.

INAF: Product Assurance Manager in the CUSP mission.

INAF: Project Manager in the SWEATERS project.

**Professional Appointments and Affiliations**

- 06/2015 - 12/2015 – OHB: internship
- 01/2016 - 06/2016 – INAF: internship
- 05/2016 – 11/2016 – CIFS: researcher
- 11/2016 – 05/2019 – INAF: research fellowship
- 05/2019 – 02/2022 – INAF : research grant
- 02/2022 – in itinere – INAF : Technologist, permanent staff at INAF HQ

• **Lorenzo Natalucci**

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| <p><b>Dr. Lorenzo Natalucci</b></p> <p>INAF-Istituto di Astrofisica e Planetologia Spaziali</p> <p>Via del Fosso del Cavaliere, 100 Rome, Italy</p> <p>Tel: +39 06 45488 4461</p> <p>Fax:</p> <p>Email: Lorenzo.natalucci@inaf.it</p> | <p><b>Role in the Italian participation in the ATHENA project</b></p> <p><b>Member of X-IFU Calibration team</b></p> <p><b>Validation of Athena Scientific requirements</b></p> |
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**Experience/Education**

Degree in Physics, University of Bologna, Italy (110/110).

Fellowships of CNR, Ministry of Education, and ESA to work at CNR/Bologna and CESR Toulouse.

**Previous Project Participations / Responsibilities**

Project scientist of the AHEAD and AHEAD2020 infrastructure programs (EU/Horizon2020)

P.I. of the ASI/INAF agreement for INTEGRAL mission support

P.I. of the ASI/INAF agreement for the support of the Italian teams participating to the EU/HEMERA balloon program

Member of the Nustar Science Team

Member of the INTEGRAL Multi-messenger Team

Panel Chair for the INTEGRAL Time Allocation Committee

Member of ESA review panel for the INTEGRAL Science Ground Segment

INTEGRAL/IBIS Software Manager

Lead proposer of the GRINTA mission, pre-selected (phase-1) at the ESA 2021 Fast mission call

Member and WG Chair of the IACHEC (International Consortium for High Energy Calibration)

Co-investigator of NASA mission proposals EXIST, POLSTAR, Xenia; and of ESA mission proposals GRI, EDGE. P.I. of ASI funded studies for EXIST and GRI.

**Professional Appointments and Affiliations**

Sept 1994-Aug 2001: Research grants, CNR and INAF.

Sept 2001-Lug 2017: Research staff member at INAF/Tor Vergata, Rome.

Aug 17- present: First researcher at INAF/IAPS, Rome.

• **Fabrizio Nicastro**

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| <p><b>Dr. Fabrizio Nicastro</b></p><br><br><p>INAF-OAR</p> <p>Via Frascati 33, 00078 Monte Porzio Catone (RM), Italy</p> <p>Tel: +39 06 94286-478</p> <p>Fax:</p> <p>Email: <a href="mailto:fabrizio.nicastro@inaf.it">fabrizio.nicastro@inaf.it</a></p> | <p><b>Role in the Italian participation in the ATHENA project</b></p><br><br><br><br><br><br><br><br><br><br><p style="text-align: center;"><b>Scientific Coordinator of the Athena GS</b></p> |
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| <b>Experience/Education</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p>PhD in Astrophysics, University of Rome “La Sapienza”, Italy (1999)</p> <p>“Laurea” Degree in Physics, University of Rome “La Sapienza”, Italy (110/110; 1995).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Previous Project Participations / Responsibilities</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <p>Member of the XIFU Consortium of the Athena mission</p> <p>Member of the XIFU-Science Advisory Team of the Athena mission</p> <p>Member of two Science Working Groups of the Athena mission</p> <p>PI of the ESA-Voyage-2050 White paper on HiReX (a very high-resolution X-ray grating concept)</p> <p>Co-I of the proposed NASA-Midex concept Whim-Ex</p> <p>PI of a science team to “hunt for the Universe missing baryons” since 2002 and PI of two discovery papers on the issues published by Nature in 2005 and 2018 and one Science review paper in 2008</p> <p>PI of numerous accepted XMM-Newton and Chandra Large and Very-Large observing proposal</p> |
| <b>Professional Appointments and Affiliations</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <p>Since 2022: Affiliation with the University of Xiamen, Xiamen, China</p> <p>Since 2006: Researcher at the INAF-OAR</p> <p>2006-2016: Research-Associate at the Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA</p> <p>1998-2006: Astrophysicist (Grade 14) at the Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA</p> <p>2004-2005: Associate Professor (“Titular-B”) at the Universidad Nacional Autonoma de Mexico, Mexico City</p> <p>2014-2015: Visiting scientist at the University of Crete, Heraklion, Greece</p> <p>2008-2011: Visiting senior scientist at the University of Crete, Heraklion, Greece</p>                 |

- **Bianca Salmaso**

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| <p><b>Dr. Bianca SALMASO</b></p> <p>INAF-OAB</p> <p>Via Emilio Bianchi 46, 23807 Merate, Lc, Italy</p> <p>Tel: +39 02 72320428</p> <p>Fax:</p> <p>Email: bianca.salmaso@inaf.it</p> | <p><b>Role in the Italian participation in the ATHENA project</b></p> <p><b>BEaTriX</b></p> <p><b>Project Manager and System Engineer</b></p> |
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| <p><b>Experience/Education</b></p> <p>PhD in Astronomy and Astrophysics, Insubria University, Italy</p> <p>Master Degree in Physics, Milano University, Italy, 110/100 cum laude</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p><b>Previous Project Participations / Responsibilities</b></p> <p>Deputy Project manager for the ESA project “The Back-up IXO (former XEUS) optics Technology, Phase 1”, ESA contract # 22545 (INAF-OAB)</p> <p>Responsible of the WP 10.2, within the WP10 “X-ray Optics Joint Research Activity (JRA)”, AHEAD2020 (Integrated Activities for the High Energy Astrophysics Domain), grant agreement no. 871158 (INAF-OAB)</p> <p>Responsible of the WP 1400 “Ottiche”, accordo attuativo ASI-ATHENA no. 2019-27-HH.0 (INAF-OAB)</p> <p>Member of the WP 4000 “Public Outreach and Education”, TAO-X (Tecnologie Avanzate per Ottiche in raggi X), accordo attuativo ASI no. 2019-24-HH.0 (INAF-OAB)</p> <p>Responsible of the hot slumping technology (INAF-OAB)</p> <p>Member of the ATHENA Telescope Working Group</p> <p>Responsible of the photolithographic process of power Bi-CMOS (STMicroelectronics, Agrate, Italy)</p> |
| <p><b>Professional Appointments and Affiliations</b></p> <p>Since 2018, Technologist, permanent staff member, Istituto Nazionale di Astrofisica (INAF), Osservatorio Astronomico Brera (OAB), Merate, Italy</p> <p>From 2013 to 2017: Research grant, Istituto Nazionale di Astrofisica (INAF), Osservatorio Astronomico Brera (OAB), Merate, Italy</p> <p>From 2009 to 2012: Scholarship, Istituto Nazionale di Astrofisica (INAF), Osservatorio Astronomico Brera (OAB), Merate, Italy</p> <p>From 1994 to 2003: Litho Process Engineer, ST Microelectronics, Agrate Brianza (MB), Italy</p>                                                                                                                                                                                                                                                                                                                                       |

• **Michela Todaro**

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| <p><b>Dr. Michela Todaro</b></p><br><br><p>INAF – Osservatorio Astronomico di Palermo</p> <p>Tel:</p> <p>E-mail: <a href="mailto:michela.todaro@inaf.it">michela.todaro@inaf.it</a></p> | <p><b>Role in the Italian participation in the ATHENA project</b></p><br><br><p><b>X-IFU Thermal Filters local Project Manager, local Product Assurance Manager and local Risk Manager</b></p> <p><b>WFI Optical Filters local Project Manager, local Product Assurance Manager and local Risk Manager</b></p> |
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| <p><b>Experience/Education</b></p> <p>2013 – Master's Degree in Physics, Università degli Studi di Palermo</p> <p>2018 – PhD. in Material Science and Nanotechnology, Università degli Studi di Catania e Università degli Studi di Palermo</p> <p><b>Previous Project Participations / Responsibilities</b></p> <ul style="list-style-type: none"> <li>- Participation to calibration and testing of thermal and optical blocking filters for the X-IFU and WFI instrument of Athena space mission</li> <li>- Fellowship within the ASTROSMART project. “Remote sensing by aerostatic balloons” profile.</li> </ul> <p><b>Professional Appointments and Affiliations</b></p> <ul style="list-style-type: none"> <li>- Associated to INAF since 2018</li> <li>- Since December 2022 – Technologist at INAF – Osservatorio Astronomico di Palermo.</li> </ul> |
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- **Guido Torrioli**

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| <p><b>Dr. Guido Torrioli</b></p> <p>CNR-IFN Rome</p> <p>Via Fosso del cavaliere 100 Rome (Italy)</p> <p>Tel: +39 0641522229 +39 06415221</p> <p>Fax: +39 0641522220</p> <p>Email: guido.torrioli@ifn.cnr.it</p> | <p><b>Role in the Italian participation in the ATHENA project</b></p> <p><b>Responsible of the CryoAC CFEE and WFEE</b></p> |
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| Experience/Education                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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| <p>“Laurea” degree in Physics (former university regulations)</p>                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Previous Project Participations / Responsibilities                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p>X-IFU X-ray Integral Field Unit for the ATHENA mission</p> <p>XXVI PNRA expedition to Antarctica for Cosmological Observations from Concordia COCHISE telescope</p> <p>ROG Experiment (INFN) for the detection of Gravitational Waves with resonant bars and SQUIDs amplifier</p> <p>MQC Experiment (INFN) for the detection of Macroscopic Quantum Coherence with SQUIDs</p> <p>BIOMAGNETISM for the detection of magnetic fields produced by living organisms with SQUIDs</p> |
| Professional Appointments and Affiliations                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <p>2002- to date Senior Researcher CNR</p> <p>1988- 2001 Researcher CNR</p>                                                                                                                                                                                                                                                                                                                                                                                                        |

• **Luca Valenziano**

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| <p><b>Dr. Luca Valenziano</b></p><br><p>INAF-Bologna</p> <p>Via Piero Gobetti 101, 40129 Bologna</p> <p>Tel: +39 0516398700</p> <p>Fax:</p> <p>Email: luca.valenziano@inaf.it</p> | <p><b>Role in the Italian participation in the ATHENA project</b></p><br><br><br><br><br><p><b>X-IFU ICU Advisor Project Manager</b></p> |
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**Experience/Education**

Master degree (1992 - Vote: 110/110) in Astronomy and Astrophysics at Università degli Studi di Roma "La Sapienza".

Ph.D. in physics (1995) -

Senior Researcher at INAF/OAS Bologna

**Previous Project Participations / Responsibilities**

ESA Planck LFI: team leader for the development of cryogenic on-board calibrator

ESA Euclid Mission: Project Manager for the NISP instrument (2008-2011); Project Manager for Italian contribution to NISP (Warm electronics, on-board SW, Cryogenic GRISM wheel); Scientific responsible for INAF for the global Italian contribution to Euclid;

ELT HIRES instrument (High Resolution Spectrograph) Phase A Project Manager

**Professional Appointments and Affiliations**

- 1993 –1995 – Perugia University, Physics Department
- 1994-1996 – PNRA: Progetto Nazionale di ricerche in Antartide
- 1996-present: INAF – Osservatorio di Astrofisica e Scienza dello Spazio
- 2016-present: INAF – chief Officer for multilateral collaborations