

SYMPOSIUM ON TECHNOLOGICAL REQUIREMENTS FOR FUTURE SPACE ASTRONOMY AND
SOLAR-SYSTEM SCIENCE MISSIONS (A7)
Space-Agencies Long-Term Views (1)

Author: Dr. Ivo Ferreira
ESA, The Netherlands, ivo.ferreira@esa.int

Dr. Mark Ayre
ESA, The Netherlands, mark.ayre@esa.int

Dr. Marcos Bavdaz
European Space Agency (ESA), The Netherlands, marcos.bavdaz@esa.int

Dr. Eric Wille
ESA, The Netherlands, eric.wille@esa.int

Mr. Martin Linder
European Space Agency (ESA), The Netherlands, martin.linder@esa.int

Dr. David Lumb
ESA, The Netherlands, david.lumb@esa.int

Dr. Tim Oosterbroek
ESTEC, European Space Agency, The Netherlands, toosterb@rssd.esa.int

Dr. SEBASTIAAN FRANSEN
European Space Agency (ESA), The Netherlands, Sebastiaan.Fransen@esa.int

ATHENA: MISSION AND SPACECRAFT DESIGN FOR A NEXT GENERATION X-RAY
TELESCOPE.

Abstract

ATHENA, Europe's next generation x-ray telescope, has recently been selected for the 'L2' slot in ESA's Cosmic Vision Programme, with a mandate to address the 'Hot and Energetic Universe' Cosmic Vision science theme. The mission is currently in the Assessment/Definition Phase (A/B1), with a view to formal adoption after a successful System Requirements Review. This paper will describe the reference mission architecture and spacecraft design produced during Phase 0 by the ESA Concurrent Design Facility (CDF), in response to the challenging technical requirements and programmatic boundary conditions.

The main requirements and their mapping to resulting design choices will be presented, at both mission and spacecraft level. An overview of the spacecraft design down to subsystem level will then be presented (including the telescope and instruments), touching upon the critically-enabling technologies where appropriate. Particular emphasis will be placed on the design choices made in response to the angular resolution requirements of the telescope (5" Half-Energy Width for a point-source), the astrometry (3" Absolute Knowledge Error) and related pointing requirements, and the requirement to rapidly respond to the majority of Target-of-Opportunity requests (within 4 hours from receipt of the request for 80% of instances).

Finally, a programmatic overview will be given of the on-going Assessment Phase, within the overall process of achieving mission adoption in 2019/2020.