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The X-ray Integral Field Unit for the second large class ESA mission Athena

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The Athena mission is the second large mission of ESA with an expected launch date of 2028. The data will be gathered by a very large mirror (2 m2) with a 5 arcsec resolution. Athena will have two instruments: the Wide Field Imager combines a large field of view (40 x 40 arcmin2) with Si-class energy resolution and the X-ray Integral Field Unit (X-IFU) which enables high spectral resolution over a 5'equivalent diameter field of view. This instrument employs calorimeters which are read-out by Transition Edge Sensors (TES) which operate around ˜100 mK. In its baseline configuration, it is made of a monolithic array of 3840 single pixels with a spectral resolution of 2.5 eV. The data will be read-out using Frequency Domain Multiplexing and the cooling system will enable an operational lifetime of more than 5 years. In this paper, we will present the top-level instrument performance and associated science drivers. In addition we will demonstrate the unique capability of this instrument for some relevant science cases.

The X-IFU will be provided by an international consortium led by France, The Netherlands and Italy, with ESA member state contributions from Belgium, Finland, Germany, United Kingdom, Poland, Spain, Switzerland together with the United States and Japan.

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