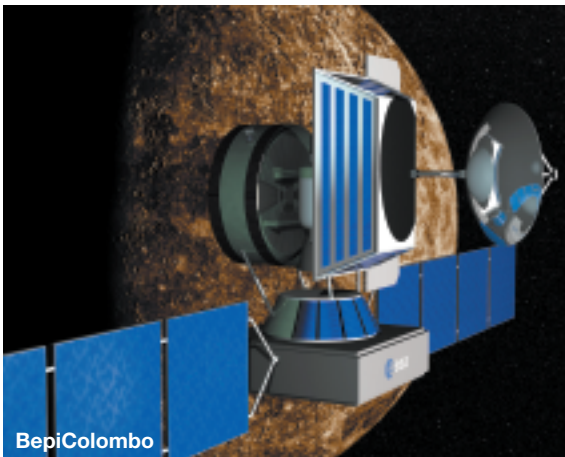
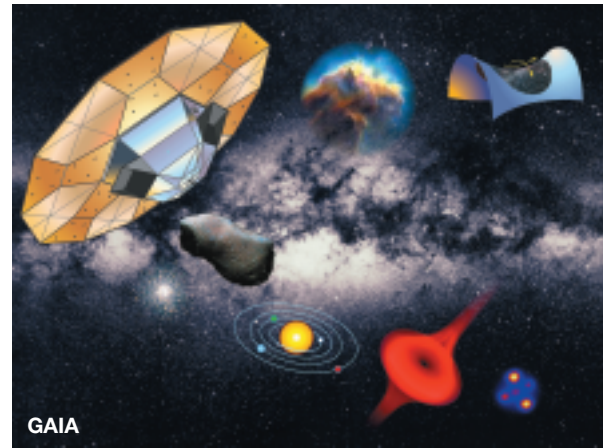


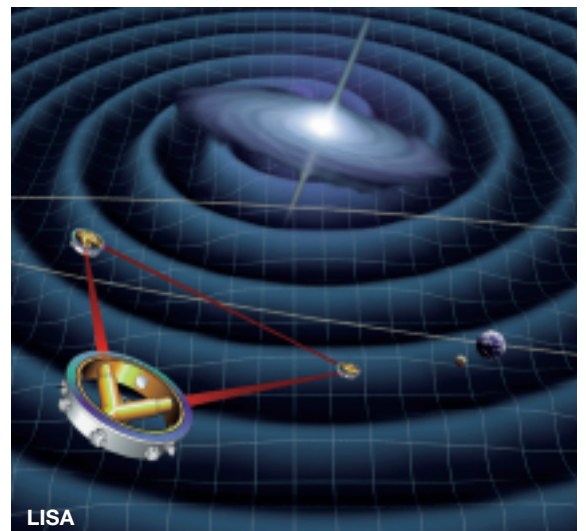
The Candidate Cornerstone Science Missions

The first four articles in this issue of the Bulletin describe the 'Cornerstone' missions that are under study in the ESA Science Programme. 'Cornerstones' are defined as being missions that are world-class, scientifically excellent, and require significant new technology development prior to implementation. The four missions presented here

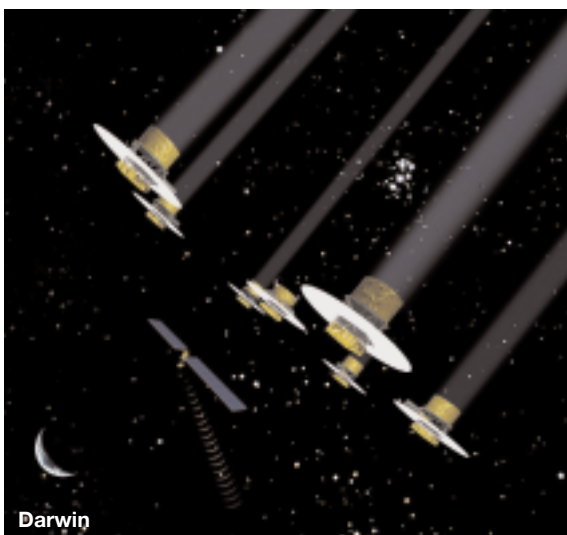


have been under study for some three years to define the mission concepts and technology needs. Two, namely BepiColombo and GAIA, have reached a sufficient point of definition to consider them as candidates for selection as the next Cornerstone mission to be launched in 2009. The other two, Darwin and LISA, still have some way to go in terms of key technology developments before either can be implemented as a full mission. Both, however, are being studied actively and have associated technology-development programmes to prepare for eventual flight projects. Part of this programme includes some pre-cursor flight testing of key

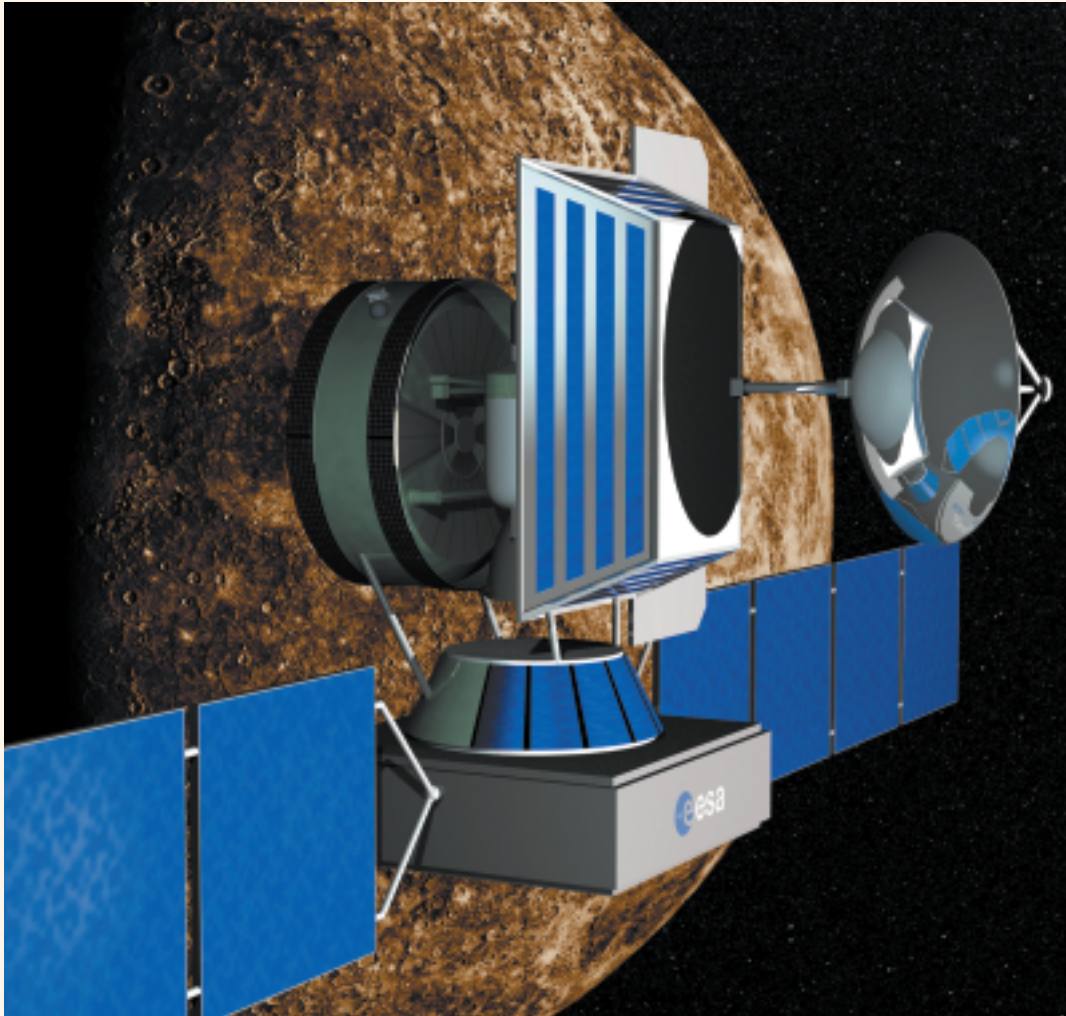
technology items. These will be tested on a dedicated flight in 2006. The concept of Cornerstones began in 1984 with the inception of the strategic plan for Space Science known as Horizon 2000. In that document, four Cornerstones were identified, namely: the Solar Terrestrial Physics Programme (STP), which included the SOHO and Cluster missions; the XMM X-ray observatory; the Rosetta cometary mission; and the Far-Infrared Space Telescope, FIRST. All of these



missions are either already flying, or will be flown by 2007. Beyond 2007, the next funding opportunity is for a launch in 2009. It is expected that either BepiColombo or GAIA will be selected in October 2000 for this launch date. Further launch opportunities will occur at three- to four-year intervals.



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The BepiColombo spacecraft (cruise configuration in the single-launch scenario) superimposed on an image of the planet Mercury collected during the Mariner-10 flyby mission (courtesy of NASA)



Giuseppe Colombo (1920-1984). The ESA Science Programme Committee (SPC) recognised the achievements of the late Giuseppe (Bepi) Colombo of the University of Padua by adopting his name for the Mercury Cornerstone mission. The Italian scientist was a mathematician and engineer of astonishing imagination who

explained Mercury's peculiar habit of rotating three times around itself in every two revolutions around the Sun. He also advised NASA how to place Mariner-10 into an orbit that would enable it to perform three flybys of the planet Mercury in 1974-1975