

VISTA: Visible Interferometric Space Telescope Array

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Abstract

A network of geosynchronous placed space telescopes to be operated concurrently to form an interferometric array using the technology available for computer simulated interferometry following the experience with aperture synthesis interferometric astronomy used at the VLT. The SLS program would be used for launch and propulsion to geosynchronous orbit.

1 Introduction

In order to maintain the edge of astrophysical science, NASA must innovate observational astronomy. Through the success of the previous decade's Great Observatories program many questions such as the age of the universe, the formation of stars and planetary systems, and the gamma ray bursts have been investigated with unprecedented depth. The next phase of projects should focus on new combinations of existing technologies.

Specifically, a series of space telescopes placed in geosynchronous orbit could transmit data down to ground stations with predictable latency and be combined using digital interferometry to

form an image. Receiving stations on Earth can back up the data in real time with their associated timestamps to prevent any loss from further communication with a central processing centre.

2 Telescope Specifications

Each telescope should not be constructed in the old style of one at a time with a unique configuration. In order to maintain consistency and ease of production, a modular style must be adopted. A central core piece with power and ports for each side would allow for repeated production of pieces to be fitted into the 'device slots' on each face of the core. The telescopes would adopt the upgraded Hubble's optical and near UV and infrared range of 200 to 1700 nm using a reflector mirror module with a radius of 1 to 1.5 m that could be assisted by modules on other sides of the core.

3 Conclusion

VISTA would use the heavy lift capability of the SLS to great a new generation of and telescope operation to probe the cosmic mysteries such as early solar system construction, early star formation, and the evolution of galaxies.

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