

## 4.3.3 Next Generation Space Telescope (NGST)

As implied by its name, the Next Generation Space Telescope (NGST) is foreseen as the successor to the current Hubble Space Telescope (HST), which, according to current plans, will undergo its final Servicing Mission in 2003. NASA has been pursuing definition and feasibility studies of a follow-on mission since 1996, and the NGST project is now identified as a key element of NASA's 'Origins' long-term program.

In 1997, NASA formally invited ESA to consider extending their successful HST collaboration to NGST. Following the recommendations of an ESA NGST Task Group and endorsement by the Science Programme Committee, technical feasibility studies are being initiated with the aim of identifying possible ESA contributions to NGST that might fit within the financial envelope of an 'F-type' mission of the Horizons 2000 programme. It is intended that the ESA NGST industrial studies will be carried out in phase with the corresponding studies on the US side, and be completed in early 1999.

Although HST and NGST share many basic scientific aims, NGST is, on several counts, not merely a 'bigger and better' scaled-up version of HST. Just as HST brought the dramatic advantages of diffraction-limited imaging unhampered by the Earth's atmosphere to astronomical observations at UV and visible wavelengths, NGST will do the same for the near-IR spectral region.

As presently envisaged, NGST will consist of a passively cooled 6-8 m-aperture telescope optimised for the 1-5  $\mu\text{m}$  region, with possible extensions down to 0.5  $\mu\text{m}$  in the visible and up to 30  $\mu\text{m}$  in the IR. This shift to longer wavelengths with respect to HST is required on both scientific and technical grounds. A preeminent scientific goal of NGST is to probe the Universe at earlier times and hence larger redshifts than accessible with HST. Optimal performance in the near-IR demands low-temperature optics and instrumentation – a requirement not easily reconciled with simultaneous operation in the visible and UV.

Another major difference with respect to HST is the choice of orbit. In order to employ passive cooling for the telescope and instrumentation, it is necessary to place NGST in a deep (L2 or further) orbit. Astronaut servicing will thus not be possible.

### Introduction

### Scientific goals

