



To: European Astronomy Community

Ground based European Nulling Interferometer Experiment (GENIE)

Dear Colleagues,

This letter is to inform you on the activities leading to the preparation of ESA's InfraRed Space Interferometer-Darwin devoted to the detection of Earth-like planets, their characterization and their ability to sustain life on them;

A secondary objective is to provide astrophysical imaging and spectroscopy at unprecedented spatial resolution.

The mission concept currently foresees a multi-spacecraft system, exploiting the new technology of nulling interferometry, as well as high spatial resolution to uncover and analyze the faint light emanating from the planet.

In order to realize this project in the second decade of the new millennium, ESA has initiated an ambitious technology development program that will extend over the next few years. As part of this program, ESO and ESA intend to implement a ground based nulling interferometer at ESO's VLT installation in Paranal, Chile. This instrument referred to as GENIE (= Ground based European Nulling Interferometer Experiment), will fulfill the following goals:

1. To gain required technological experience and demonstrate the technique of nulling interferometry with a breadboard representative of the Darwin mission
2. To carry out required pre-cursor science viz.
 - a. Detection and measurement of exo-zodiacal disks in the Darwin target systems
 - b. Detection and characterization of large objects in the Darwin target systems
3. To allow European scientists to gain experience with a nulling interferometer in doing practical astronomy, and to train a new generation of 'interferometrists' in preparation of the utilization of Darwin
4. To carry out unique and valuable science.

The actual development of GENIE is foreseen in the following manner:

1. ESA and ESO will jointly define the instrument
2. Two competitive Definition/Phase A studies will be carried out by industry. To this end ESA will prepare and issue an Invitation To Tender (ITT) to industry during the first quarter of 2002. These two studies will provide the detailed design of GENIE.
3. A small Science Study Team (SST) comprising members from the community, jointly appointed by ESA and ESO, will be set up to support all the scientific aspects of **this study phase**

4. A workshop will be held on the 3 – 6 of June 2002 at the Lorenz center, Leiden, The Netherlands to brief the community and associated industry/laboratories after the first phase of the studies has been initiated.
5. At the end of the studies (9 months), a decision on whether to proceed with GENIE or not will be taken jointly by ESO and ESA.
6. In case of a positive decision, **the implementation phase** will be started. The chosen design will be contracted out to industry on the bases of competitive tender. It is intended that the actual builder of GENIE will subcontract relevant parts of the work to suitable laboratories, institutes and Small and Medium Enterprises (SME).
7. An Announcement of Opportunity to the scientific community will be issued in order to form a Science Working Team (SWT) **for the implementation phase**.

The tender description for the contracts will spell out in detail the way to involve European groups already experienced in the building of first generation instruments for the VLTI. The appointed SWT will monitor the development of the instrument. The SWT will:

1. Support ESA/ESO in the implementation of GENIE
2. Support ESA/ESO on the technology development & implementation required by GENIE and monitor the progress of the actual construction of GENIE
3. From the science drivers specified in the rationale for GENIE and results achieved in the definition study phase, establish target scientific objectives
4. Provide input in the fields of exo-planetology, exo-zodiacal dust, and astrophysical imaging targets

The role and responsibilities of the SWT and the management of the operational phase of the instrument will be given in the GENIE Science Management Plan (SMP) which will be agreed jointly by ESA and ESO upon formal approval by both organizations.

In return for their involvement in the development of GENIE, and once the instrument becomes operational, the SWT members will receive a fraction of the available observing time in the form of Guaranteed Time Observations.

We would appreciate if you would distribute this opportunity for participation in GENIE to interested colleagues.

Yours sincerely

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