

B.20 STARDUST PARTICIPATING SCIENTISTS PROGRAM

1. Scope of the Program

NASA's STARDUST mission is scheduled to return dust samples from Comet P/Wild-2 to Earth in January 2006. NASA is establishing a STARDUST Participating Scientists program in order to allow scientists with expertise in sample analysis to participate as members of the STARDUST Science Team in the initial analysis during the Preliminary Examination Period. The Preliminary Examination Period starts with the receipt of the sample canister at the STARDUST Laboratory in NASA's Johnson Space Center (JSC) in Houston. The Preliminary Examination period ends about eight months later, when the entire STARDUST sample collection is deposited with NASA's Astromaterials Curator at JSC. During the Preliminary Examination Period, the Principal Investigator (PI) of NASA's STARDUST Discovery Mission, Dr. Donald Brownlee of the University of Washington, and the STARDUST science team will make an initial analysis of a subset of the total returned sample population, prepare an initial report of findings for public release, and, together with the NASA Astromaterials Curator, prepare the STARDUST samples for general distribution and analysis by qualified investigators. During the Preliminary Examination Period, only a small number of simply prepared samples will be subjected to detailed examination by the STARDUST science team using thin-sections, potted butts, particles and tracks encased in aerogel, individual particles separated from the aerogel, and craters in solid materials. The STARDUST PI will retain overall responsibility for this Preliminary Examination Period effort, working with the STARDUST science team, including STARDUST Co-Investigators and STARDUST Participating Scientists selected through this solicitation.

At the time of the release of this solicitation, the analysis efforts to be conducted by the STARDUST science team during the Preliminary Examination Period is expected to be organized into six subteams, each led by a subteam leader as follows:

1. Mineralogy/Petrology
2. Bulk Composition
3. Optical Measurements
4. Organics
5. Isotopes
6. Craters in Aluminum foil.

The overall goals for the Preliminary Examination Period will be:

1. Provide adequate level of preliminary examination so that samples can be intelligently requested and optimally used for maximum science return. This will include the number and size distribution of samples, the frequency of track types (carrot, stylus, or crater), the general characterization of samples (elemental and mineralogical composition and variance), an assessment of the degree of interaction with aerogel, and fragmentation, thermal alteration, and interaction with the aerogel.

2. Compare P/Wild-2 samples with known extraterrestrial material samples. In particular, determine the extent to which P/Wild-2 materials are similar to any known type of meteoritic samples or distinct from them.
3. Provide information on the ratio of presolar to nebula materials in P/Wild-2. In particular, determine the approximate content of established presolar grain types that can be distinguished by large H, C, N, or O isotopic effects
4. Strive for acceptable balance between science output and rapid release of samples to the overall scientific community.

Participating Scientists selected through this solicitation will be expected to work in close collaboration with the STARDUST Co-investigators and other members of the STARDUST science team as organized into the subteams defined above. The members of each subteam will be expected to publish as a group and at the same time. The STARDUST PI will lead the ensemble of all of the subteams and be responsible for their activities including coordination with the NASA Astromaterials Curator.

Proposers to this STARDUST Participating Scientists program solicitation must propose a scientific investigation, sample preparation, or other supporting role, based on the materials preliminarily available after the return of the STARDUST capsule to the NASA curatorial facility at JSC, that contributes directly to any of the first three overall goals given above. However, once selected, STARDUST Participating Scientists must pursue their research within the framework of the subteam(s) to which they are assigned and within the policies given in this solicitation. This STARDUST Participating Scientists program opportunity is premised on early access to samples of Comet P/Wild-2, which may be analyzed in the proposers' own facilities using existing equipment, ideally as a logical extension of ongoing research on cosmic materials that may already be underway. Therefore, the purchase or otherwise modification of equipment to handle STARDUST samples is not appropriate for this program.

Since it is anticipated that most of the STARDUST Science Team meetings will either be telecons or held in conjunction with national meetings, it is anticipated that only minimal additional per diem costs might be necessary as part of the budget for proposers to this program. Researchers whose investigations can be supported with already available resources are welcome to propose. In order to ensure equitable comparison of both high- and low-cost proposals for selection to this program, and consistent with the evaluation criteria given in Appendix C of the *Guidebook for Proposers*, the absolute cost of a proposed effort will only be used to discriminate between proposals of otherwise equal scientific and technical merits.

Note that for NASA to properly evaluate the relevance to NASA goals of proposals submitted to its programs, as well as to track its progress towards achieving its goals as mandated by the Government Performance Review Act (GPRA), all research supported by NASA must demonstrate its relevance to NASA's Goals and Research Focus Area's

(RFA's) as stated in the latest version of its Strategic Plan (follow links from the Web site <http://spacescience.nasa.gov/>); see also the discussion in Section 1 of the *Summary of Solicitation* of this NRA. The analysis of samples of the cometary materials is relevant to at least: i) Goal I, Solar System Exploration, RFA 1(b); ii) Goal II, Solar System Exploration, RFAs 1(a), 1(b), 1(d), and 2(a); and iii) Goal II, Astronomical Search for Origins, RFAs 1(a) and 1(b). All proposers to this program must describe the relevance of their specific investigation to the Goals, Science Objectives, and RFA's given in Table 1 in this NRA's *Summary of Solicitation*. The appropriate place for this statement of relevancy is in the introduction to the proposal's "Scientific/Technical/Management" section (see Section 2.3.5 in the *Guidebook for Proposers*). The index numbers in this table may be used to identify a specific RFA, for example, "Goal I, Sun-Earth Connection Theme, RFA 1(c)" or "Goal II, Astronomical Search for Origins, RFA 3(b)."

2. Sources of Information and Data

For more information on the STARDUST mission, see the mission homepage at <http://stardust.jpl.nasa.gov/>.

The Astromaterials curatorial facility web site (<http://curator.jsc.nasa.gov/>) provides essential information about the facilities available at JSC, as well as the current STARDUST Preliminary Sample Examination Plan.

3. Supplemental Information

The page limit for STARDUST Participating Scientists program proposals is 5 pages.

4. Programmatic Information

It is anticipated that approximately \$1.5M (\$0.5M in Fiscal year (FY) 2005 funds and \$1M in FY 2006 Funds) will be available for this program, which is expected to run for 18 months, beginning in April 2005 and ending in September 2006, approximately eight months after the return of the STARDUST sample canister. Following the completion of the preliminary examination, the Science Team will be disbanded, and access to these samples will be through standing procedures followed in NASA's Cosmochemistry program (see Appendix B.2 in this NRA). Support for analyses of STARDUST samples after the conclusion of the STARDUST Participating Scientists program and the disbanding of the Stardust Science Team will be offered through the Discovery Data Analysis Program (see Appendix B.17 in this NRA).

