

Subject: Call for Members of the WFIRST Science Definition team

Call for Letters of Application for Membership on the Science Definition Team for the Wide Field Infrared Survey Telescope (WFIRST)

October 19, 2010

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The National Aeronautics and Space Administration (NASA) invites scientists, technologists, and other qualified and interested individuals at U.S. institutions and elsewhere to apply for membership on the Science Definition Team (SDT) for the Wide Field Infrared Survey Telescope (WFIRST). WFIRST is a strategic mission sponsored by NASA's Astrophysics Division that was recommended as the top priority large project by the National Research Council's Decadal Survey of Astronomy and Astrophysics, entitled "New Worlds, New Horizons in Astronomy and Astrophysics" (the Astro2010 Decadal Survey, available at http://www.nap.edu/catalog.php?record_id=12951).

WFIRST will be a wide-field near-infrared space telescope capable of performing imaging and spectroscopic sky surveys with multiple goals including gravitational microlensing surveys for exoplanets, large-area sky survey and deep surveys for research in dark energy, and other extragalactic and Galactic research programs.

The members of the WFIRST SDT will provide NASA with scientific assistance during preliminary concept definition (Pre-Phase A) activities. Near-term activities of the SDT members will focus primarily on assessing the scientific approach to achieving the goals of the WFIRST space mission as outlined by the Astro2010 Decadal Survey.

Participation in the WFIRST SDT is open to all qualified and interested individuals.

The charter for the WFIRST SDT will be posted to <http://wfirst.gsfc.nasa.gov/> in early November 2010. A draft charter will be discussed at a public teleconference of the Astrophysics Subcommittee of the NASA Advisory Council on October 29, 2010; those interested in listening to the Astrophysics Subcommittee's public teleconference should contact Dr. Hashima Hasan for information (hhasan@nasa.gov; 202-358-0692). The text below provides an overview of some of the anticipated activities of the WFIRST SDT; the final SDT charter will describe additional details of the approach to accomplishing its goals.

THE WFIRST MISSION

As envisaged by the Astro2010 Decadal Study, WFIRST will be a 1.5-meter-class wide-field-of-view near-infrared-imaging and low-resolution-spectroscopy space telescope. WFIRST will address two of the most fundamental questions in astrophysics: Why is the expansion rate of the universe accelerating? And are there other solar systems like ours, with worlds like Earth? In addition, WFIRST will allow astronomers to tackle issues of central importance to understand how galaxies, stars, and black holes form and evolve.

To settle fundamental questions about the nature of dark energy, the postulated cause of the accelerating expansion of the universe, WFIRST will employ three distinct techniques – measurements of weak gravitational lensing, baryon acoustic oscillations, and supernova distances. To search for exoplanets, it will monitor a large sample of stars in the central bulge of the Milky Way for small deviations in brightness due to microlensing by intervening stars and their associated planetary systems. Finally, WFIRST will offer a robust guest investigator program supporting key and archival studies of broad astrophysical topics.

DETAILS OF THIS CALL

Response to this Call is in the form of a Letter of Application. SDT members will be selected by NASA HQ from the pool of respondents and other qualified candidates. The selected members will have demonstrated expertise and knowledge in areas highly relevant to the WFIRST primary scientific goals and related technology, including: methods for dark energy research, such as weak gravitational lensing of galaxies, baryon acoustic oscillations (galaxy redshift surveys), and supernovae distances; stellar microlensing surveys and their use for detecting extrasolar planetary systems; the origin and evolution of extrasolar planetary systems; figure of merit forecasting for dark energy research and extrasolar planet searches; sky surveys in the near infrared; ancillary extragalactic and Galactic science relevant to WFIRST; and space-based telescope and infrared focal plane instrumentation design and development. The Letter should provide evidence of the candidates demonstrated expertise in one or more of these areas.

The Letter may also contain a brief list of references to scientific or technical papers the applicant has published that establish her/him as a leader in the dark energy, exoplanetary, or extragalactic survey community or as an expert in WFIRST-related technology areas. The Letter should also contain a statement of how much time the applicant will have over the next two years for activities related to the WFIRST SDT, particularly if there are any major constraints that may restrict full engagement in the significant amount of work that will be required to define the scientific and investigation approach to the WFIRST mission.

NASA's charge to the SDT will be to provide science requirements, investigation approaches, key mission parameters, and any other scientific inputs needed to support the design of an optimized space mission concept satisfying the overall goals of the WFIRST mission as outlined by the Astro2010 Decadal Survey. Justification for conducting the WFIRST investigations from space and an assessment of how such investigations will complement existing and planned domestic and international ground and space facilities will be included in the SDT's report.

The WFIRST SDT will develop findings for NASA that can be used to help assure the optimum scientific return from WFIRST and, in particular, to ensure preparedness for beginning formal formulation and development of the mission. Members of the WFIRST SDT will work in collaboration with NASA Headquarters, NASA Program and Project management and technical personnel at the participating field centers, and the astronomical community to provide input during the pre-formulation study phase of WFIRST. Among the products to be produced by the SDT will be a Design Reference Mission (DRM) that describes a preliminary investigation approach for the WFIRST prime science mission, including the expected scientific impact of the proposed strawman investigations.

Additional details of SDT activities will be described in the SDT charter. It is expected that a preliminary report by late-spring 2011 will be used as a basis for a conceptual mission design that is mature enough to support anticipated NASA negotiations with the European Space Agency on a possible collaborative mission. A final SDT report is expected by approximately mid-2012, subject to future programmatic considerations.

The initial meeting of the WFIRST SDT will be targeted for early 2011. The SDT can be expected to meet in person 3 to 5 times per year for (typically) two to three days. They also may have phone-in meetings. Meetings will be called by the SDT Chair, and the agendas will be set by the Chair in coordination with NASA management to ensure that planned activities are aligned with programmatic needs and expectations. All travel expenses to meetings will be reimbursed.

All meetings of the WFIRST SDT will be open, all reports and other output of the WFIRST SDT will be made publically available, and the WFIRST SDT will be disbanded prior to any future Announcement of Opportunity (AO) for participation in the WFIRST mission, including provision of instrumentation.

Membership in the SDT will be determined by NASA after review of Letters solicited by this Call. Approximately 12-15 SDT members and the SDT Chair will be selected from among the respondents. The NASA WFIRST Program Scientist, the NASA WFIRST Project Scientist, and possibly other agency representatives will be *ex officio* members of the SDT.

Letter applications, not to exceed two pages in length, are invited from individuals, not groups. Collaborations and teams are not solicited. Each Letter is to be limited to two pages, with 11-pt font and 1-inch margins. Letter applications submitted by e-mail are preferred, but may also be submitted by regular mail or fax. Responses to this invitation should be received by the WFIRST Program Scientist no later than November 23, 2010, at the following address:

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The issuance of this Call for Letters of Application does not obligate NASA to accept any of the applications. Any costs incurred by prospective investigators in preparing submissions in response to this Call are incurred completely at the submitter's own risk.