

# Dark Energy Task Force

## Call for White Papers

In February 2005 the NSF-NASA-DOE Astronomy and Astrophysics Advisory Committee (AAAC) and the NSF-DOE High Energy Physics Advisory Panel (HEPAP) established a Dark Energy Task Force (DETF) as a joint subcommittee to advise NSF, NASA, and DOE on the future of dark energy research.

The names of the DETF committee members, as well as the charge to the committee, may be found at <http://www.nsf.gov/mps/ast/detf.jsp>.

The DETF was asked to advise the agencies on the optimum near- and intermediate-term programs to investigate dark energy and, in cooperation with agency efforts, to advance the justification, specification and optimization of a ground-based Large Survey Telescope (LST) and a space-based Joint Dark Energy Mission (JDEM). The DETF will prepare a final report for submission to the AAAC and HEPAP with a target date of December 2005.

In particular, the DETF was charged to:

1. Summarize the existing program of funded projects by projected capabilities, systematics, risks, required documents, and progress-to-date.
2. Summarize proposed and emergent approaches and techniques for dark energy studies; that is, characterize these approaches and techniques by the added value the projected capabilities would provide to the investigation of dark energy.
3. Identify important steps, precursors, R&D and other projects that are required in preparation for JDEM, LST and other existing or planned experiments.
4. Identify any areas of dark energy parameter space that the existing or proposed projects fail to address.

We expect that the DETF will prioritize techniques for studying dark energy but will not rank specific projects.

In the present landscape of the study of dark energy, we expect numerous experiments leading up to JDEM and LST. Because the funding agencies will use the DETF report to help direct their resources, it is important for the committee to have information from all experimental groups, including an outline of each project's scientific goals and experimental approaches.

Hence, the DETF announces a "Call for White Papers" from all projects relating to the study of dark energy, including those that address emerging or high-risk techniques. The DETF is very interested in considering creative projects of high risk but which may produce large impacts on the measurement of dark energy. A similar but separate call will be issued to solicit contributions describing theoretical studies of dark energy.

White paper submission instructions follow below. Thank you very much for your help.

## **Submission Instructions:**

1. Length: up to 7 pages of text describing the experiment. Figures, tables and other supplementary material may be included in excess of the 7-page text limit.
2. **Due date: 15 June 2005.**
3. Submit to: DETF Chair, Rocky Kolb, at [rocky@rigoletto.fnal.gov](mailto:rocky@rigoletto.fnal.gov).
4. Content:
  - a. A cover page, including:
    - i. personnel and institutions involved;
    - ii. overview of the goals and techniques of the project;
    - iii. brief description of your baseline proposal (i.e.: survey X square degrees to y magnitude in the A, B, C bands).
  - b. A list of required precursor observations, developments, or fundamental calibrations (e.g., training sets for photometric redshifts).
  - c. A discussion of the expected error budget, including where possible:
    - i. potential sources of systematic error and their expected magnitudes;
    - ii. the basis for estimating systematic errors;
    - iii. assumed priors.
  - d. Explain how the project will quantify our understanding of dark energy. Please be as quantitative as possible. For example, one way to answer this question is to describe how your experiment could measure a departure from a vanilla  $\Lambda$ -CDM model with  $w = -1$  and  $w' = 0$ . For uncertain levels of systematic error, please indicate how the results depend on the achieved level.
  - e. A discussion of the project's risk areas and strengths.
  - f. State whether the technique requires specific technology R&D.
  - g. If the experiment is a precursor to the LST and/or JDEM projects, explain the relationship.
  - h. Describe any access to facilities and other instrumentation needed for the experiment.
  - i. Provide a timeline for the completion of the experiment.

Of course, not every project will be able to provide information for every area. Please simply state if a particular area is not applicable to the project.