

Status of JDEM

HEPAP Meeting

November 13, 2008

Washington, D.C.

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Associate Director of the Office of Science
for High Energy Physics

DOE/NASA Joint Dark Energy Mission (JDEM)



Both the National Academy “Beyond Einstein” Panel and the FY 2008 Omnibus Bill gave guidance that DOE and NASA should work together on JDEM.

DOE, NASA and Office of Science and Technology Policy (OSTP) have been meeting regularly to lay out the plan for a mission.

The JDEM website with our plan was made public on September 12, 2008 →
<http://jdem.gsfc.nasa.gov>

Topics:

Summer 2008 – Letters exchanged between agencies

A Figure of Merit Science Working Group was formed to update the work of the Dark Energy Task Force

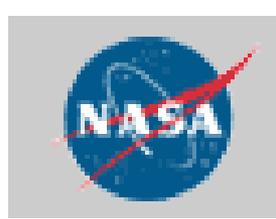
A Science Coordination Group was formed to lay out the top level science requirements.

A Letter to the Community regarding draft contents of the Announcement of Opportunity (AO) was released on 11/3/08.

DOE and NASA signed a JDEM MOU on 11/7/08. Details will be available soon.

JDEM

DOE's Starting Points



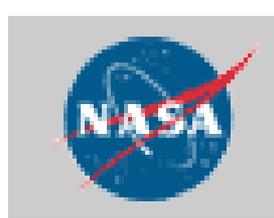
DOE plans to provide ~ \$200M in FY08\$ to the JDEM project – construction + operations

NASA should lead the overall mission.

We want to participate in the science instrumentation, operations and data analysis. We will not participate in mission-level components.

For our hardware contributions, we need clean interfaces and will follow our own procurement practices. As is typically done, a project manager will be assigned for our deliverables.

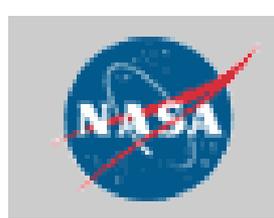
DOE/NASA Joint Dark Energy Mission (JDEM)



Letters Exchanged between Ed Weiler & Ray Orbach – summer 2008

- DOE and NASA agree to partner in a JDEM.
- NASA will be the lead agency for JDEM, responsible for the success of the overall space mission.
- JDEM will be a medium-class strategic mission with a competitively selected, PI led dark energy science investigation with a science payload that includes a wide-field telescope and appropriate focal plane instrumentation. Cost control will be a central tenet of JDEM project management and mission design.
- The selected PI-led science investigation team will perform the dark energy science investigation. The selected team will not provide flight hardware.
- The Government will provide the mission-level components, including launch services and the spacecraft bus, as well as the science payload. DOE and NASA will partner in the fabrication of the instrumentation necessary to execute the dark energy science investigation. Both agencies will contribute to the science operations and data analysis activities.

DOE/NASA Joint Dark Energy Mission (JDEM)

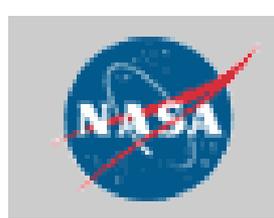


Letters Exchanged between Ed Weiler & Ray Orbach - continued

- The specific responsibilities of each agency will be detailed in an Implementation Agreement that will be established after the competitive selection of the dark energy science investigation that defines the mission architecture.
- DOE and NASA will each contribute funding as necessary to fulfill the particular responsibilities each agency agrees to accept. Each Agency will utilize its normal procurement rules in the construction of its contributions.
- Public release of JDEM data will occur after an appropriate period of time following its acquisition.
- In consultation with DOE, NASA will investigate the possibility for international contributions. As the lead U.S. agency, NASA will be the principal point of contact for the JDEM project in negotiating and executing any international partnerships with foreign space agencies.
- There will be joint participation in the selection of the principal investigator-led dark energy science investigations, and in the construction and operations of JDEM.

→ The agencies have signed a Memorandum of Understanding

JDEM Project Offices



A JDEM Project Office (PO) has been established at Goddard Space Flight Center.

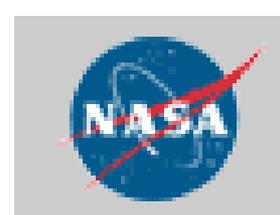
- **This Office has overall management responsibility for the mission, and will interact closely with JDEM scientists during all phases of the mission.**
- **Kevin Grady is the acting project manager.**

DOE has set up a project office at LBNL that will work within the framework of NASA's project office.

- **Michael Levi has been assigned as the project manager.**
- **DOE's project manager will be the principal point of contact with NASA's project office and will coordinate and lead the all DOE efforts.**



JDEM Figure of Merit Science Working Group (FoMSWG)



SWG convened by DOE and NASA in June 2008 – Chair is Rocky Kolb

“The purpose of this SWG is to continue the work of the Dark Energy Task Force in developing a quantitative measure of the power of any given experiment to advance our knowledge about the nature of dark energy..... DETF did an outstanding job but with passage of time, the community recognized that the original Figure of Merit (FoM) may no longer be optimum.”

Charge to the JDEM SWG – produce findings:

- Update or replace the original DETF’s FoM with a new, superior measure or measures of the scientific power for advancement in our knowledge of dark energy. This measure will presumably be a function of the accuracies that any given experiment can provide for a set of parameters associated with the dark energy equation of state.
- Determine a threshold value for this measure
- Attempt to minimize bias toward particular methodology or theory

9/25/08 – Rocky presented initial findings to agencies

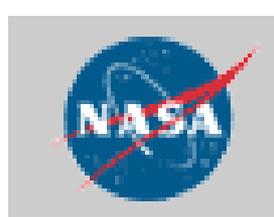
October – presentations to AAAC and JDEM SCG

http://www.nsf.gov/attachments/109635/public/Kolb_JDEM_FoMSWG.ppt

~ end-November – final results available



JDEM Science Coordination Group (SCG) Chair: Neil Gehrels



9/12/08 – letters of application for the SCG solicited

9/26/08 – Science Coordination Group letters due

10/4/08 – SCG membership announced

4 2-day meetings starting mid-October

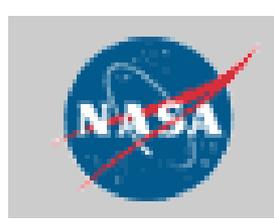
Mid-December 2008 – results delivered to agencies and SCG disbanded

Notice posted 11/10/08: The community is invited to provide input for the SCG's consideration at the web site:

<http://jdem.gsfc.nasa.gov/comments.html>

- 1) The SCG will determine the top-level science and observational preliminary observational requirements and instrumentation capabilities for a JDEM mission using the science performance measures from the FoM SWG, incorporating at a minimum the Baryon Acoustic Oscillation (BAO), Supernovae (SN) and Weak Lensing (WL) techniques.
- 2) Evaluate science performance of an initial Reference Mission (RM) pre-conceptual design, provided by the JDEM Project Office using the BAO, SN and WL techniques and consider whether additional techniques should be included, within programmatic constraints.
- 3) In coordination with the SCG, the JDEM PO will modify the initial RM design to meet the SWG science goals, optimize the science return, consistent with programmatic constraints of mission cost, schedule, technical risk.
- 4) The RM description will be delivered to the agencies by mid-December and will be incorporated into the JDEM AO and the science teams will propose their investigations based upon this.
- 5) The SCG will be disbanded so that people can propose to the AO

JDEM AO Information



A Letter to Community with draft info about AO was posted 11/3/08 to JDEM website. The notice was also sent out over DPF listserve, to lab directors and grant PIs.

It is anticipated that the AO will solicit six types of proposals:

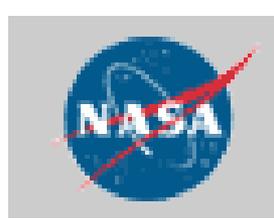
- a) DE Baryon Acoustic Oscillation (BAO) science investigations using the relevant JDEM data set;
- b) DE Supernovae (SN) science investigations using the relevant JDEM data set;
- c) DE Weak Lensing (WL) science investigations using the relevant JDEM data set;
- d) DE science investigations based on other techniques, using the relevant JDEM data set;
- e) Leader of the JDEM Science Working Group (SWG);
- f) Interdisciplinary non-DE science investigations using the relevant JDEM data set.

It is anticipated that there will be selection of three to eight investigations from categories (a) – (d) above, at least one each from categories (a) – (c), one from category (e), and at least one from category (f).

The PIs selected under this AO, plus possibly one or two Co-Investigators (Co-Is) proposed by each PI, will constitute the JDEM Science Working Group (SWG). The JDEM SWG will work with the NASA JDEM Project Office and the NASA Project Scientist (Neil Gehrels) in the design, development, and operation of the JDEM observatory.

All members of a selected science investigation team will have access to that JDEM data necessary for the execution of their proposed science investigation.

JDEM AO Information cont.



It is anticipated that →

- The proposers will describe their dark energy science investigation using the JDEM Reference Mission pre-conceptual design.
- Subsequent to the AO-based selection of the JDEM SWG, the JDEM design may evolve from the Reference Mission.
- AO will require proposers to use the methodology defined in the JDEM FoMSWG Report to document the relevant figures of merit of their proposed investigation and thereby quantify its science performance.

JDEM data, including suitable calibration and processing tools, must be made available to the public within one year following data acquisition.

Please see the Letter to the Community for more details.

JDEM MOU



Ray Orbach and Ed Weiler (head of the NAS Science Mission Directorate) signed the JDEM MOU on 11/3/08 and 11/7/08, respectively.

A press release will come out soon and the MOU will be posted on the JDEM website.

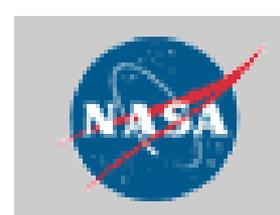
Note: Most of the content in the MOU is in the previous slides.



U.S. DEPARTMENT OF
ENERGY

Office of Science

Joint Dark Energy Mission (JDEM)



DOE →

DOE program manager (OHEP): Kathy Turner

DOE JDEM project Manager: Michael Levi (LBNL)

NASA →

Physics of the Cosmos Program Scientist: Michael Salamon

JDEM Program Executive: Ray Taylor

JDEM Program Scientist: Richard Griffiths

JDEM Project Office at GSFC: Kevin Grady, Acting Project Manager

JDEM Timeline



The agencies continue to investigate international participation (NASA is principal POC)

Targeted for the end of 2008

- NASA will release an Announcement of Opportunity (AO), jointly written with DOE, which will be an open solicitation for proposals for PI-led dark energy investigations using the JDEM facility.
- A letter to the community will be released in mid-October and will provide advance information regarding the AO.

January 2009 – Phase A starts

- Within the next few months, the JDEM Project Offices at DOE and NASA will develop a proposed split of the scope of work and present it to the agencies for approval.

Summer 2009

- Selected investigations announced.
- The PI's and their collaborators will work with the JDEM Project Offices at both agencies throughout the development of the mission and will execute the dark energy science investigations after launch and commissioning.

Launch ~ middle of the next decade.