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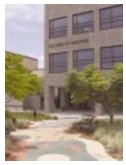

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US launches joint effort to probe dark secrets of the Universe

Tony Reichhardt, Washington

Physicists are shooting for the stars in a bid to understand the mysteries of dark energy — the enigmatic force behind the Universe's accelerating expansion.

In a ground-breaking collaboration, the US Department of Energy (DOE) has teamed up with NASA to plan a series of launches that will explore this exotic area of astrophysics.

The proposed Joint Dark Energy Mission could reach the launch pad around 2014 and, although it is not yet funded, it has strong political backing. The White House Office of Science and Technology Policy initially asked the DOE and NASA to find a way to cooperate on a space-based mission to investigate dark energy, a topic that figures prominently in both agencies' scientific 'road-maps'. A National Academy of Sciences report released last year also identified dark-energy investigations as an area where astronomers and high-energy physicists could join forces.

NASA envisages the mission as the first in a series of 'Einstein Probes', costing around $500 million each, which would address specific problems in astrophysics (see *Nature* **420,** 593–594; 2002). Meanwhile, scientists at the DOE's Lawrence Berkeley National Laboratory in California have been leading conceptual studies of a Supernova/Acceleration Probe (SNAP), which would be geared mainly towards characterizing dark energy. Saul Perlmutter, an astrophysicist at the laboratory and primary investigator on the SNAP project, says that studies of dark energy unite the interests of cosmologists and particle physicists. "The fields have become so intermixed that you really can't do one without the other," he says.

On the move: the motion of supernovae provides evidence for the existence of dark energy.

SNAP would consist of a two-metre telescope, roughly the same diameter as the Hubble Space Telescope. But its detector would have a billion picture elements, more than 100 times the number on Hubble's best camera. From its vantage point in space, SNAP would be optimized to survey supernovae, which serve as yardsticks to calibrate the distance and speed of objects receding from us — key evidence of dark energy's mysterious pull.

Although an instrument such as SNAP would not automatically be selected for the Joint Dark Energy Mission, it would be a strong contender, says Paul Hertz, NASA's lead scientist for research on the structure and evolution of the Universe. He says that NASA and the DOE will soon form a panel to set the scientific requirements for the dark-energy mission.

The two agencies have worked together on smaller projects before, and are collaborating on the Gamma-ray Large Area Space Telescope (GLAST), which is planned for launch in 2006. The dark-energy probe would be an even closer partnership. But it would not be equal in terms of funding: Hertz reckons that NASA would pay as much as three-quarters of the cost, and the project would be based at the agency's Goddard Space Flight Center in Greenbelt, Maryland. ■

SPACE TELESCOPE SCIENCE INST./NASA/SPL

Canada prepares to pull the plug on fusion project

Geoff Brumfiel

Canada's bid to host the international fusion project ITER has stalled and the country may now quit the experiment altogether.

In 2001, Canada offered a site at a nuclear facility in Clarington, Ontario, as a location for the US$5-billion prototype fusion reactor. But it now looks certain that its bid will be allowed to die, leaving Japan, France and Spain as the remaining contenders.

Canada's federal government and the provincial government of Ontario had been prepared to guarantee US$1.5 billion in loans to the other countries in the ITER partnership to help pay for the experiment. They had been unwilling to stump up hard money to pay for their own bid, however.

This left supporters of the project in Canada struggling to secure federal or provincial funds before December, when a location for ITER is to be chosen.

But these efforts ground to a halt after elections earlier this month, which resulted in a change of government in Ontario, says Murray Stewart, who heads ITER Canada, the non-profit entity running the Canadian bid. Stewart says that he is launching a last-minute blitz to sell ITER to newly elected lawmakers, but the prospect of mobilizing large amounts of funding looks slim.

"I have not seen any evidence that the federal government is anxious to participate," says University of Toronto president Robert Birgeneau, who organized a government-mandated study on ITER last year.

Canada has been part of the ITER design project since 1992. But if it doesn't host the reactor, it might withdraw from ITER entirely, says David Baldwin, who heads the fusion group at nuclear-energy company General Atomics in San Diego. "There is no strong fusion community in Canada," Baldwin says, adding that such a withdrawal is unlikely to damage the project. "I don't see a threat of other pull-outs," he says. ■