# Letters

## Human Immunodeficiency Virus

At a meeting on 22 and 23 May 1986 the Executive Committee of the International Committee on Taxonomy of Viruses (ICTV) endorsed the name human immunodeficiency virus recently proposed by a large majority of the members of a study group of ICTV headed by Harold Varmus (Letters, 9 May, p. 697) as appropriate for retrovirus isolates implicated as causing the acquired immune deficiency syndrome (AIDS). The new name describes the host and a major biological property of the virus, recognizes the difference of the virus from isolates of human T cell lymphotropic virus types I and II, and avoids any controversy regarding priority of discovery of the virus and emotive connections of the virus with AIDS and its methods of transmission. The ICTV is working toward a uniform international nomenclature for viruses based on their taxonomy. Much still remains to be learned about the relationships of the human immunodeficiency virus with other retroviruses, and therefore designation of an international name would be premature. However, the committee recommends the use of the name human immunodeficiency virus as the vernacular name to replace HTLV-III and LAV.

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## DOE Fusion Program

Mark Crawford (News & Comment, 25 Apr., p. 446) discusses the findings of the National Academy of Sciences Committee for Review of the Department of Energy (DOE) Inertial Confinement Fusion Program (the Happer committee). Unfortunately, his comments perpetuate a common misconception regarding the direction of inertial confinement fusion (ICF) research. Crawford states that "Supporters of the fusion program have feared that generic energy production aspects of ICF research would suffer if the program is loosely mixed with DOE weapons activities that could overshadow it." This implies that two mutually exclusive directions of research are open to ICF at present, one energy-related and one weapons-related. This is not the case.

The Happer committee identified several potential applications of ICF, ranging from the laboratory simulation of nuclear weapons effects (a "weapons application") to the breeding of fissile fuels and production of electricity ("energy applications"). The immediate goal of the ICF program, as stated in the Happer committee's interim report, is "to produce a propagating thermonuclear burn in a small laboratory pellet imploded by a pulsed laser or particle beam." This objective supports both the military and energy applications of ICF.

The Congressional Budget Request for fiscal year 1987 submitted to Congress by DOE asks for $23.8 million of operating funds for inertial fusion. This represents only the portion of the program carried out in the three support laboratories: KMS Fusion, University of Rochester Laboratory for Laser Energetics, and the Naval Research Laboratory. The remainder of the program is carried out at three DOE laboratories: Lawrence Livermore National Laboratory, Los Alamos National Laboratory, and Sandia National Laboratory. For fiscal year 1987, the budgets for inertial fusion research at these three laboratories are subsumed under nuclear weapons research, development, and testing (weapons RD&T), for which a total of $1.8 billion was requested. In 1986, ICF research at the national laboratories received operating funds totaling about $130 million. The three support laboratories received about $23.9 million in fiscal year 1986, after the Gramm-Rudman reduction. Thus, the 1987 budget provides nearly the same funding level for the three support laboratories as in 1986, although not necessarily the same level of effort.

Crawford's article is incorrect in describing the fiscal year 1987 budget proposal as attempting to reduce DOE support for ICF to $23.8 million. Funds for weapons RD&T can be used within the three national laboratories to support ICF activities. The allocation of these funds is to be determined by the directors of the respective laboratories in consultation with DOE, as I understand it. It is true that many supporters of ICF, including some members of Congress and the Happer committee, object to this arrangement because it will reduce the visibility of the ICF program within DOE and could lead to a reduction of effort devoted to ICF within the national laboratories, where the largest research facilities have been constructed.

The main thesis of Crawford's article is that the ICF program is burdened by overclassification. I agree. At present, results are published in the foreign literature that we in the United States are not allowed to report openly. Classification restrictions prevent us from reporting some of our most compelling results. The Happer committee was able to hear the entire story about the status of the program, and then concluded that "the ICF program is a vigorous and successful research effort which has made striking progress over the past few years."

Crawford's article unfortunately omits any mention of KMS Fusion's role in the ICF program. The company has been a major participant in the program for 15 years and remains dedicated to the quest for economical fusion energy.

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*Response*: Glass's letter is much appreciated. He correctly observes that funding for the inertial fusion program will be higher than stated in my article. It should be noted, however, that it is not yet clear how much funding the ICF program will get next year. Initial talks within DOE indicate that program funding could slip to around $115 million. Whether the House and Senate appropriations committees will accept this reduction is uncertain.—MARK CRAWFORD

## European Space Telescope

I read with care and interest the article "Infrared astronomy after IRAS" by G. H. Rieke *et al.* (21 Feb., p. 807). The article reviews the goals of infrared astronomy, summarizing how the Infrared Astronomy Satellite has contributed to progress in the field and discussing how further progress will be achieved with the Space Infrared Telescope Facility. However, it barely mentions the only, to my knowledge, approved infrared mission after IRAS—the Infrared Space Observatory (ISO).

The original proposal for ISO was submitted to the European Space Agency (ESA) in 1979. After several studies and assessments, ISO was chosen in March 1983 to be the next new start in the ESA Scientific Programme. This selection carries with it the funds necessary for the entire mission. The launch date is 1992, and the operational lifetime in orbit will be at least 18 months.

ISO will provide astronomers with a unique facility of unprecedented sensitivity for a detailed exploration of the universe ranging from objects in the solar system right out to the most distant extragalactic sources. Its wavelength coverage, 3 to 200 microns, spans a region rich in scientific interest, but which has hitherto not been studied in detail. The cryogenically cooled

60-centimeter telescope will be equipped with four complementary and versatile focal plane instruments, which will permit imaging, photometric, spectroscopic, and polarimetric observations. Consortia of national scientific institutes, in close conjunction with ESA, are already building these instruments, which will be delivered to the Agency for launch and operations in orbit.

It would seem that in the area of infrared astronomy after IRAS, the Europeans are now building what Rieke *et al.* are dreaming of.

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*Response*: We welcome Bonnet's letter and thank him for bringing to the U.S. scientific community a more complete picture of the capabilities of the Infrared Space Observatory (ISO) than we presented in our article. Astronomers on both sides of the Atlantic have recognized the scientific importance of the infrared band and the tremendous gains that can be made with modern infrared detectors on cooled telescopes in space. These gains are vividly demonstrated by the Infrared Astronomy Satellite (IRAS), surely a dramatic advance in the exploration of the universe.

Within this country, the importance of a coordinated program to exploit these unparalleled sensitivity gains was recognized in a recommendation in 1974 by the Space Science Board that NASA proceed with the Space Infrared Telescope Facility (SIRTF) promptly after IRAS. The National Academy of Sciences' study on priorities for astronomy in the 1980's, the Field report, was written on the assumption that SIRTF would move ahead early in this decade. Unfortunately, this assumption has proved incorrect.

When the proposal for ISO was made by the European Space Agency (ESA) in 1979, attempts were made to join the two projects, but these attempts foundered for a variety of reasons. The SIRTF team has continued to explore this issue, most recently at the International Society for Optical Engineering (SPIE) conference in November 1985. At that time, the uncertain schedule for SIRTF appeared to make collaboration impossible.

Detailed descriptions of both projects were presented in a joint ISO-SIRTF session at that conference, available as *SPIE Proceedings*, volume 589, "Instrumentation for optical remote sensing from space." It was apparent from these presentations that SIRTF will be much more capable than ISO in sensitivity, image quality, and pointing stability; ISO was described by members of its team as an intermediate step between IRAS and SIRTF. Nonetheless, ISO will be a powerful facility for more detailed study of many IRAS sources. Given the richness of the infrared sky revealed by IRAS, ISO can be expected to make additional discoveries not anticipated in IRAS. However, SIRTF will be required to answer many of the scientific questions posed in our article.

The performance that ISO will ultimately achieve will depend on the rapidity with which European engineers and infrared astronomers assimilate the requisite technology and adjust the plans for ISO to accommodate it. In a field pioneered for many decades in the United States, it is with some regret that American astronomers must now step aside while ESA has the first pick of the exciting and tantalizing IRAS findings.

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