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GEOPHYSICAL, ASTROPHYSICAL, AND PLANETARY SCIENCES SECTION

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Action Plan Statement to: House Subcommittee on Space & Aeronautics

Clark R. Chapman, 9 June 1998

In response to the request of Chairman Rohrabacher at the end of the May 21st hearings, I offer these recommendations for an "Action Plan" to implement the Spaceguard Survey. From the hearings, I take it that the Subcommittee's consensus is to implement the goal presented in the June 1995 Shoemaker Report ("Report of the Near-Earth Object Survey Working Group") and recently adopted by NASA, according to Dr. Pilcher's testimony before this Subcommittee. That goal is:

"To extend the discovery of Near-Earth Asteroids larger than 1 km diameter to 90% completeness within 10 years."

First, I address the technical options available for implementing the Survey. Second, I address ways to decide on the options and get the various players organized so that the Survey might begin, in an appropriate international context.

TECHNICAL ELEMENTS OF THE SPACEGUARD SURVEY

Required elements of the Survey are:

(1) Completion of upgrades (to telescopes and state-of-the-art detectors) and establishment of full-up operations of the four current U.S. survey sites: Spacewatch, LONEOS, LINEAR, and NEAT.

(2) To build at least one more dedicated 2-meter telescope OR to dedicate to the Survey approximately 6 of the existing USAF 1-meter GEODSS telescopes (some are currently operational, a few are currently mothballed).

(3) Acquire guaranteed time on ancillary telescopes, in particular half-time on a 3- to 4-meter telescope for observations of physical properties of a sample of near-Earth asteroids, time on telescopes (especially in the southern hemisphere) for astrometric follow-up, and time as required on the two major exisiting planetary radar facilities.

(4) Support a center (analogous to the Minor Planet Center), at an adequate level for the greatly increased discovery rates anticipated, to oversee and coordinate the Survey; to collect, disseminate, and archive the data; to perform routine calculations to track discovered near-Earth asteroids; and to provide ephemerides for astrometric or physical observational follow-up. Additionally, support the research community to evaluate the ongoing results of the Survey in the context of the impact hazard.

(5) Coordinate with existing international efforts and broaden international participation in the Survey.

Comment:

NASA's effort (described in testimony) primarily supports element #1, although it is not clear if immediate procurement of the required state-of-the-art detectors is supported. NASA explicitly will NOT support construction of any new telescopes in #2, although it "hopes" to cooperate with the USAF to employ GEODSS facilities (the alternative option in #2). Such cooperation (and funding for it) is not yet fully arranged, nor is it clear that NASA or the USAF are planning for the required level of about 6 dedicated GEODSS facilities. NASA's budgetary plans do not appear to cover items #3 and #4, although they need not be fully implemented until #1 and #2 are in place.

HOW TO IMPLEMENT THE SPACEGUARD SURVEY

(1) Establish the Spaceguard Survey as a Project (analogous to a small space mission with defined goals, rather than as an open-ended ongoing research program); lead responsibility should be by NASA but there should be specified, supporting roles for the USAF and other potentially relevant federal entities (e.g. DOE, FEMA).

(2) Mandate that existing contacts between NASA and the USAF be upgraded, with milestones, so that a detailed technical and funding agreement is reached by the end of CY 1998 on agency roles within the Spaceguard Survey, including for example: (a) development, fabrication, and provision by the Air Force of an adequate number of state-of-the-art detectors like that on the existing LINEAR facility and (b) identifying the precise role of GEODSS facilities in the Survey. The Science Committee should use its good offices (e.g. with House and Senate National Security Committees) to foster the cooperation. Special attention should be given to USAF costs, for which estimates do not yet exist. If an interagency agreement cannot be reached for the full level of Air Force participation required, it will be necessary to proceed with the alternative option: construction of new 2-meter telescopes.

(3) Request that NASA submit a Project plan and budget for review within 3 months.

(4) Mandate (e.g. in authorization language) that NASA fully (not partially) implement the Survey and provide (in NASA's appropriations bill) an appropriately funded line item for the Project, not to be taken from existing scientific research programs.

(5) Facilitate international meetings so that U.S. scientists and representatives of relevant U.S. agencies meet and coordinate with counterparts from other countries (including national space agencies, international scientific unions, etc.). These meetings should include not only astronomers but also experts in risk management, hazard mitigation, etc. Since the impact hazard is international in scope, the goal of these meetings should be to establish an international framework within which the U.S. Spaceguard Survey Project can operate in an independent but coordinated way and to foster augmented international participation.