

N89-16667

| NATIONAL AERONAUTICS AND SPACE ADMINISTRATION<br>RESEARCH AND TECHNOLOGY RESUME   |                                       |
|---|---------------------------------------|
| TITLE<br><b>ASTEROID TEAM</b>   |                                       |
| PERFORMING ORGANIZATION<br><br>JET PROPULSION LABORATORY<br>4800 OAK GROVE DRIVE<br>PASADENA, CA 91109  |                                       |
| INVESTIGATOR'S NAME<br><br><b>MATSON, D. L.</b>   | TEL. NO.<br><br><b>(818) 354-2984</b> |
| DESCRIPTION (a. Brief statement on strategy of investigation; b. Progress and accomplishments of prior year. c. What will be accomplished this year, as well as how and why; and d. Summary bibliography) |                                       |

**OBJECTIVES:** The purpose of this task is to support asteroid research and the operation of an Asteroid Team within the Earth and Space Sciences Division at JPL. The Asteroid Team carries out original research on asteroids in order to discover, better characterize and define asteroid properties. This information is needed for the planning and design of NASA asteroid flyby and rendezvous missions. The Asteroid Team also provides scientific and technical advice to NASA and JPL on asteroid related programs.

**B. PROGRESS:** 1) Work on asteroid classification continued and the discovery of two Earth-approaching "M" asteroids last year was published. (The M-class is rare and these are the first found among the near-Earth asteroids to have the spectral albedo characteristic of this class. The derived diameters are about 2 km for both objects.) 2) In the asteroid photometry program we obtained N or Q photometry for more than 50 asteroids, including the two M-earth-crossers. 3) We have initiated a new program to follow-up on IRAS asteroids at the IRTF. 4) Compositional analysis of infrared spectra (0.8 to 2.6 $\mu$ m) of 60 asteroids is continuing. 5) This task supported D. Matson's travel for and participation in the NASA Planetary Astronomy Management and Operations Working Group. 6) This task is supporting the preparation of manuscripts for the publications of the IRAS Asteroid and Comet Catalog.

**C. PROPOSED WORK:** Over the next year the work on asteroid classification and composition will continue with the analysis of the 60 reduced infrared spectra which we now have at hand. The radiometry program will continue with the reduction of the N and Q bandpass data for the 57 asteroids in order to obtain albedos and diameters. This year the emphasis will shift to IRAS follow-up observations; which includes objects not observed by IRAS and objects with poor or peculiar IRAS data. As in previous years, we plan to give top priority to any opportunities for observing near-Earth asteroids and the support (through radiometric lightcurve observations from the IRTF) of any stellar occultations by asteroids for which occultation observation expeditions are fielded. Support of preparing of IRAS data for publication and of D. Matson for his participation in the NASA Planetary Astronomy Management and Operations Working Group will continue.

**D. SUMMARY BIBLIOGRAPHY:** Cruikshank, D.P. and Brown, R. H., Organic material on asteroid 130 Elektra, Science 238, 183-184; Bell et al., Composition and size of Apollo asteroid 1984 KB, Icarus 73, 482-486

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