tactical reflector on Mt. Hopkins in southern Arizona has been converted to a two-dimensional imaging detector using an array of fast phototubes. The images of interest are the Čerenkov light generated by small cosmic ray and gamma ray showers in the earth's atmosphere. Fast digitization techniques are used to give a 19 pixel image of each shower (full field of 275) with a large dynamic range. Preliminary results from the first operation of the camera in the fall of 1982 and observations of Cygnus X-3 will be presented. This project has received support from the U.S. Department of Energy, the Irish Board of Science and Technology, and a Smithsonian Scholarly Studies Grant.


The Explosive Transient Camera (ETC) is an balloon (or Shuttle) borne, wide field (~4 steradian) electronic camera array which can detect coincident gamma and optical flashes with durations of ~10^-2 to 10^-2 seconds. Each array element is a 30°x30° FOV, cooled CCD detector, developed at MIT. An optical transient as faint as B=-11 can be detected (1 second duration) with S/N > 20, and its position determined to an accuracy of ±30 arc seconds. Thus, candidate events ~10 times fainter than the archival event (plate taken in 1978) reported for the 19 November 1978 gamma ray burst (GRB) by Schaefer (1982) should be detectable in real time. A polyhedral bank of 4 slab type NaI scintillators will view the same solid angle as does the optical array, and will be sensitive to GRBs (energy range 50 keV to 1 MeV) with fluences ~5 x 10^-9 erg cm^-2. Candidate GRBs (localizable to ~20° by the gamma detectors alone; Fishman et al. 1978) will trigger an "overseer computer" to store the relevant coincident optical images (40°x40° fields). The coordinates established by the ETC will be immediately transmitted (~1 second delay) to the Rapidly Moving Telescope (RMT) under development at NASA/GSFC (Teegarden, Cline, and Rosenvinge 1982), which can further refine the position of a flash and follow its (presumed) subsequent decline. A ground-based, "optical only" test version of the ETC is planned for operation in late 1983.

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A small (15 cm) telescope with a rapid ~1 sec pointing capability designed to measure optical transient events of a few seconds duration or longer is described. The discovery by Schaefer of a transient optical event from the direction of the 19 November 1978 gamma-ray burst is the primary motivation for this investigation. The telescope will operate in conjunction with the Explorers (ETC) under development by G. Ricker at M.I.T. The ETC will detect the event and provide pointing coordinates to the RMT. The RMT will then rapidly acquire the source and using a cooled CCD at its focus will record its image. The source location accuracy is expected to be ~1 arc sec and the time resolution 1 sec. A two-axis gimbaled mirror developed at the GSFC will be used to provide the rapid source acquisition capability.


E. W. Lockwood, D. T. Thompson, and A. D. White. Lowell Observatory, and H. Tug, Ruhr-Universitat, Bochum. Atmospheric extinction has been measured nearly continuously for over 25 years at the 0.5 meter telescope located on Mars Hill, just 100 m above and 1 km west of beautiful downtown Flagstaff. By chance, during May 1982 when the volcanic ash cloud from El Chichon passed over Arizona, spectrally resolved extinction measurements from 3300 to 8400 Âwere being made each night from the same site as part of another experiment. At its peak, on 15 May, the extinction due to the cloud alone reached 0.3 mag in the visible (5500 Å) and was essentially neutral in b-v color. Continued monitoring in fall 1982 shows a decrease of 0.2 mag in the cloud extinction accompanied by a 0.2 mag increase in b-v color, suggesting a selective fallout of the larger cloud particles. Except for seasonal effects and the perturbation due to the ash cloud from the Mount Agung eruption in 1963, the ordinary extinction has been remarkably constant over the years. These data are being examined for effects associated with meteorostrical variables recorded by the National Weather Service 6 km south of Mars Hill. A complete summary and statistical analysis will be presented. This research is supported by the Division of Atmospheric Sciences, National Science Foundation.

Recent SRTI Observations at Arcelico, J.C. Tyler, UCB, R.T. Requinet, NASA, T.A. Clark, GSFC, L. Lesyna, Stanford U. During 1980 and 1981, the 305m radio telescope at the Arcelico Observatory was used to conduct a high resolution search for narrowband signals from the direction of 210 nearby solar type stars and 5 OH masers. For each star at least 4 Mhz of bandwidth surrounding the 21cm HI line and/or the 18cm OH lines was studied with a spectral resolution of 5.5 Hz in both right and left circular polarization. The formal limit of sensitivity actually achieved varied, depending upon the particular receivers available. In all cases the search could have detected a narrowband transmitter of power comparable to the Arcelico planetary radar (had any such been transmitting on the frequencies searched at the time appropriate to the observation) out to the distance of the farthest target star. As in previous searches, the number of "false alarms" encountered was