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FINAL TECHNICAL REPORT TO THE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

by

The Regents of the University of California
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"Summer Workshop in Astronomy & Astrophysics"

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SUMMARY OF COMPLETED PROJECT

High energy transients are the emissions of compact astronomical objects that exhibit rapid time variations in the X-ray and γ-ray band. More specifically the term is used to denote a generic class of high energy phenomena arising from the release of either gravitational or nuclear energy near the surface of an accreting neutron star. The time variation may be as rapid as a fraction of a millisecond, as in the case of some γ-ray bursters, or as long as several months in X-ray transients. Though studies of the various categories of high energy transients: X-ray transients, X-ray pulsars, X-ray bursts, and γ-ray bursts, have generally been carried out by diverse groups and instrumentation, sometimes having only peripheral contact, it is expected that similar physical processes may underlie all four phenomena. Thus, it was desirable to bring together experts, both observers and theoreticians, in all of these subjects to discuss recent progress in our understanding of high energy transients and to plan scientific strategy for the future. Since solar transient emissions in the X-ray and γ-ray band are also frequently studied with the same instrumentation and by some of the same scientists, they too were considered an appropriate topic for discussion. Accordingly, a meeting was convened on the campus of the University of California at Santa Cruz during the two-week interval July 11 through July 22, 1983. Roughly 100 participants were chosen so as to give broad representation to all aspects of high energy transients. Ten morning "review" sessions were held in which invited speakers discussed the current status of observations and theory of the above subjects. Afternoon "workshops" were also held, usually more than one per day, to informally review various technical aspects of transients, confront shortcomings in theoretical models, and to propose productive courses for future research. Special attention was also given to the instrumentation used to study high energy transients and the characteristics and goals of a dedicated space mission to study transients in the next decade were determined.

The scientific results of the meeting, too diverse for summary here, are reported in a 714 page volume, High Energy Transients published by the American Institute of Physics. In lieu of a final technical summary, we append the table of contents from that volume.

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