

Note to the TAC: **Pooled efforts for this large-scale project.**

This proposal is a continuation of the large-scale project that we have been pursuing over the past few semesters, discovering and studying Type Ia supernovae at the highest redshifts attainable. This work requires large amounts of coordinated telescope time: the discoveries are made with the CFHT, CTIO 4-m, and (beginning this year) Subaru telescopes, the spectroscopy is performed on the Keck telescope, and follow-up photometry is obtained with the Hubble Space Telescope (76 orbits were used in Spring 2001, and 100 orbits have been awarded for the proposed semester's work). In order to coordinate with HST follow up, it is necessary to guarantee sufficient numbers of supernovae all within a degree of a pre-chosen pointing. If the supernovae are not discovered, then the HST points at empty space for the pre-allocated exposures over the following three weeks, and those orbits would be wasted; So far, we have never failed on one of these "supernova guarantees."

As the science is requiring us to study SNe Ia at these higher redshifts, as explained in the attached proposal, the Keck telescope spectroscopy takes significantly more time to confirm each supernova (only possible at the Keck), and the SN discoveries, too, require larger amounts of telescope time to guarantee sufficient numbers of supernovae. In order to coordinate all of these telescope time requirements we have been submitting proposals every semester at every telescope, but asking that the time be allocated all together in the Spring semester. Thus (in consultation with Dr. Miller) we submitted a Keck 2001B proposal, asking that observing time be used in conjunction with requested observing time from this current proposal for the Keck 2002A Spring semester.

Finally, two new developments since our last proposal have led us to request two four-night observing runs for this proposal, as compared to last year's single six-night run:

- First, we have now added a significant additional observing asset to the collaboration, the Subaru SuprimeCam search. Our small-scale pilot search with Subaru last spring discovered 7 SNe, including redshifts above $z=1$, and we have now been awarded time to begin a search that is twice as large for this 2002A campaign. Once again, the Keck telescope will be crucial for identifying the supernovae in this redshift range.
- Second, since our last proposal, the part of our research team at Lawrence Berkeley Lab has welcomed two new tenure-level research scientists into permanent positions, Dr. Greg Aldering and Dr. Peter Nugent. Drs. Aldering and Nugent are pooling their Keck telescope time requests with those of Dr. Saul Perlmutter (also of Berkeley Lab) and Prof. Gerson Goldhaber (of UC Berkeley). We hope that this combined work of four active UC scientists -- and the four postdocs and three UC Berkeley graduate students -- will allow an ambitious large Keck project to make a major contribution in this exciting field.