

THE 1990 CALAN/CTIO SUPERNOVA SEARCH

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We started in 1990 a search for type Ia supernovae as a collaboration between the U. of Chile and CTIO, to populate the Hubble diagram for this class of objects and to study them as distance indicators. We report the 1990 discoveries, and the spectroscopic and photometric observations gathered for them; they were obtained with CCDs, with the extensive collaboration of visiting astronomers. Of the four supernovae found in 1990, three of them proved to be of the type Ia class at redshifts $0.04 < z < 0.05$. In particular, SN 1990af was found in the elusive pre-maximum phase at a redshift of $z = 0.0503$, and was observed at maximum light through the *B* and *V* filters. Although the other two SNe Ia were not observed at maximum light, their light curves match reasonably well the average curves of their class, and we can estimate their peak magnitudes. We have used the date of the three SNe in order to estimate the value of the Hubble constant as a function of the absolute *B* magnitude of SNe Ia at maximum light. We found that each SN yielded a value of H_0 with a typical accuracy of 10%, consistent with the other two objects, providing support to the claim that SNe Ia are good standard candles. Finally, we estimated H_0 assuming two values for M_B obtained from SN 1972E in NGC 5253, namely, $H_0 = 76.7 (\pm 4.3) \text{ km s}^{-1} \text{ Mpc}^{-1}$ for $M_B = -18.7$, and $H_0 = 44.0 (\pm 2.5) \text{ km s}^{-1} \text{ Mpc}^{-1}$ for $M_B = -19.9$, respectively. These results are within the current acceptable range of values for H_0 , but reflect the lack of a precise determination of M_B .

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THE 1992 OUTBURST OF THE SU UMA-TYPE DWARF NOVA HV VIRGINIS¹

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The results of 14 nights of photometric monitoring the cataclysmic variable HV Vir, following its outburst in April 1992, were analyzed. The star displays all major features of the superhump phenomenon which characterizes the SU UMa class of dwarf novae. In particular, we find a coherent oscillation with the period 84.504 min (or its alias, 84.946 min), showing a stable double peaked hump. It was clearly developed 8 days after maximum light and persisted in the light curve of the high state for about 20 days, i.e., during the major outburst phases. The oscillation developed from a shorter, less stable "early superhump period" of about 39.86 min or, more probably, 79.72 min. A third periodicity of 83.512 min, which we interpret as the orbital period, characterizes the photometric behaviour of the star during final decline from about 2^m to 1^m above minimum. Additional outbursts of HV Vir took place in 1929, 1939, 1970 and 1981.

We underline the similarities and differences between HV Vir and two other extreme members of the SU UMa group, compare the photometric behaviour of HV Vir with published numerical simulations and theoretical models of the superhump phenomenon, and point out observable features which will have to be explained by refined models of the superhump phenomenon.

¹ Based on observations collected at Wise Observatory, Tel Aviv University, Israel, European Southern Observatory, La Silla, Chile, and Sternwarte Sonneberg, Germany.

SEARCHING FOR EXTRAGALACTIC SUPERNOVA REMNANTS

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Large samples of supernova remnants (SNRs) can be used to investigate topics ranging from SNR evolution and SN rates to interstellar abundance