

# Another Trans-Plutonian Minor Planet: 1993 FW

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On March 28, 1993, David Jewitt and Jane Luu on Hawaii discovered a slowly-moving minor planet of magnitude 23. More observations were made the following night, confirming the unusual motion and indicating that it is located at a very large distance from the Sun, possibly even far beyond Pluto. The new object was given the preliminary designation *1993 FW* (IAU Circular 5730).

It was unfortunately not possible to obtain any further observations of this interesting object, also not during the next dark-moon period in April, and despite its slow motion, there was some concern that it might be lost again among the myriads of faint celestial objects. However, with the help of a rough, predicted location, furnished by the IAU Minor Planet Bureau in Cambridge, Mass. (USA), we were able to find and observe it again during two nights in mid-May 1993.

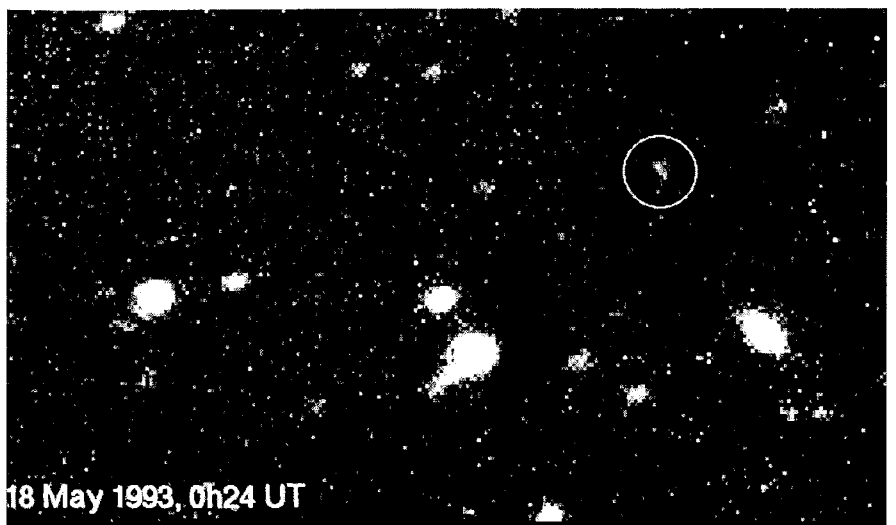
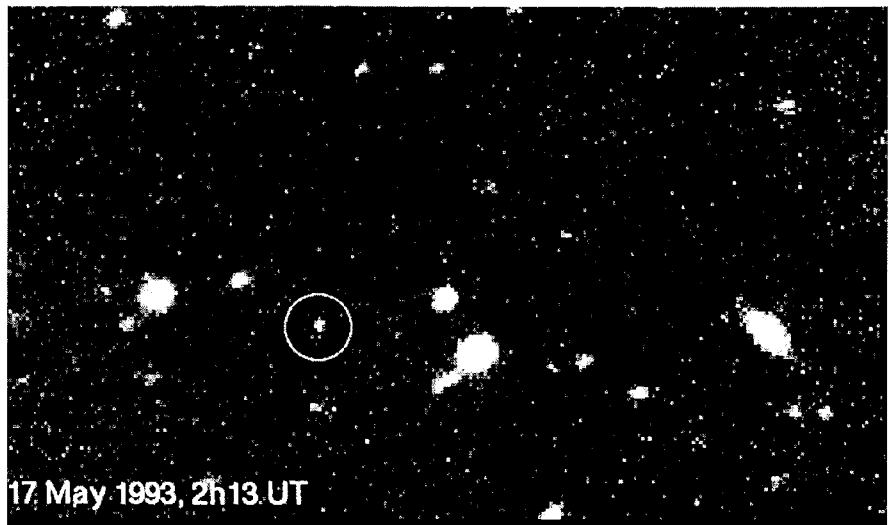
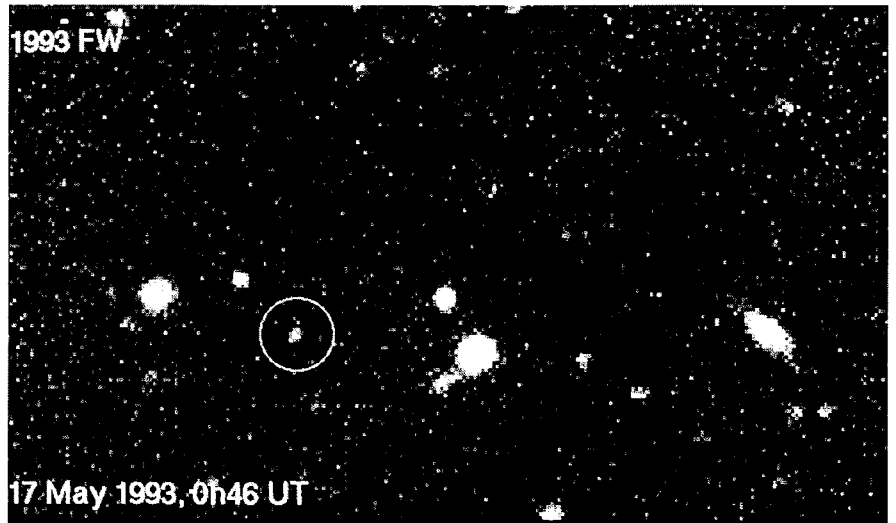
Here are shown three of these recent CCD frames with of 1993 FW. They were obtained with the 1.5-metre Danish telescope and allowed us to detect the faint images after careful computer-blinking of the frames. The object was about 30 arcseconds from the extrapolated position. The frames were immediately transferred via the permanent satellite link to the ESO Headquarters from where accurate positions, measured on the Optronics machine, were communicated to the Minor Planet Bureau. Here, Brian Marsden was able to compute a rough (circular) orbit with a nominal, mean semi-major axis of 42.34 AU and to show that the present heliocentric distance of 1993 FW must be between 39 and 48 AU, i.e. at the mean distance of Pluto (39.8 AU) or beyond (IAU Circular 5796).

At the time of these observations, the motion was only 1.7 arcsec/hour, corresponding to a shift of 41 arcseconds between the upper- and lower-most frames. The diameter of 1993 FW, as deduced from the brightness and distance, is probably a few hundred kilometres. This object is similar to minor planet 1992 QB1 which was discovered by Jewitt and Luu last year, see *The Messenger* No. 70, page 33. The two objects may belong to the hypothetical Kuiper belt and it is not difficult to predict that others will be found during the next years, especially as the observing techniques are refined.

More observations are now needed to refine the orbit of 1993 FW. They will be

attempted in June and possibly also in July, before it moves behind the Sun

and becomes unobservable until the end of the year.



Three images of the newly discovered, very distant minor planet 1993 FW obtained through a V-filter with the 1.5-m Danish telescope at La Silla (observer: O. Hainaut). The exposure time was 30, 45 and 60 minutes. The seeing was rather bad on May 18. The scale of the photos is such that the full width is 1.5 arcminutes. North is up and east is to the left.