two such detections have been made: for BL Lacertae and for the quasar PHL 1070. In both cases the extended light surrounding the active nucleus is consistent with a luminous galaxy of stars. There is a large number of nebulosities for which only a featureless continuum spectrum has been detected. The magnitude of the nebulosity is then consistent with that of a large galaxy.

Quasars and BL Lac type objects can now be more firmly identified as active nuclei of giant galaxies. For BL Lac type objects and some quasars, the surrounding nebulosity is entirely consistent with a giant elliptical galaxy. For quasars such as 3C 48, or Seyfert galaxies such as 3C 120, the nature of the "surrounding galaxy" is not as clear. The emission from the ionized gas is much larger than would be that of the stars and only a very high sensitivity would allow the detection of the intrinsic continuum and of absorption lines. Another possible approach, possible with present-day techniques for extreme Seyfert galaxies, would be the determination of a rotation curve within the nebulosity from the brighter emission lines.

CHIRON: A New Planet in the Solar System

Last October, Charles T. Kowal of the Hale Observatories in Pasadena, California, found a new planet in the solar system. Comparing two plates from the 48-inch Palomar Schmidt telescope in a blink microscope, he noticed a small trail of a moving 18th-magnitude object. From these plates and others which were obtained on the following nights, it soon became obvious that the new planet had an exceptionally slow motion. At opposition the motion of a planet is inversely proportional to the distance and a first estimate put 1977 UB (as it was designated) at about the distance of Uranus, almost 3,000 million kilometres away.

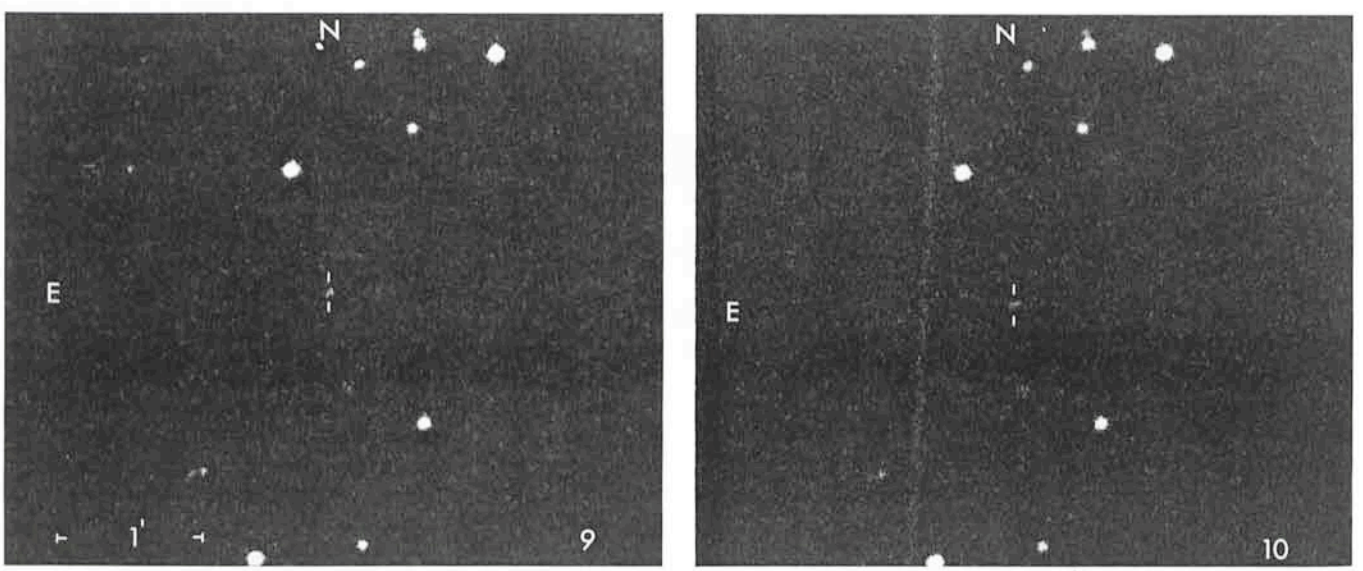
When more observations became available, it was possible for Dr. B. Marsden at the Smithsonian Observatory to confirm this distance and to establish the orbit. Extrapolating backwards, Mr. Kowal and Dr. W. Liller found 1977 UB on old plates in the Harvard plate library, obtained in 1895, 1941 and 1943. Some further observations from Palomar helped to improve the orbit, and it is now known that 1977 UB is a unique object in the solar system.

It moves in a rather elliptical orbit ($e = 0.38$) with perihel just inside the orbit of Saturn and aphel close to that of Uranus. It was actually discovered a few years after it had passed through the aphel and will become as bright as magnitude 14.5 in 1996 when it again reaches perihel. The orbital period is just over 50 years.

For the benefit of the eagle-eyed readers of the *Messenger,* we here show two plates of 1977 UB, obtained with the ESO Schmidt telescope on 1978 January 9.05209 and 10.04936 UT. The plates were exposed during 30 minutes rather low in the western sky, just after sunset. At that time the planet was nearly stationary, near its smallest right ascension. The seeing was bad, probably around 4–5 arcseconds on both occasions and the images are therefore somewhat fuzzy, in particular on the 10th.

But it does not move! exclaims the (slightly inattentive) reader. Sorry, it does. On the left hand photo (from the 9th) the position was $1^h55^m16^s.04; +11°08'21''.1$, and on the 10th $1^h55^m15^s.80; +11°08'16''.4$. This corresponds to a movement of only 3".6 to the west and 4".7 to the south (0.05 mm and 0.07 mm, respectively, on the original plate). You can see it if you measure the distances to the surrounding stars on the figures.

From the magnitude it can be estimated that 1977 UB has a diameter of a few hundred kilometres. It is most likely the first known member of a new class of asteroids outside the orbit of Jupiter, and Kowal has proposed the name CHIRON (a centaur in Greek mythology). There is, however, still the possibility that it is a comet; at very large distances, it can be very difficult to tell the difference, when no tail shows up and the "head" is perfectly stellar-like.



Two 30-minute exposures on 103a–O emulsion behind a GG385 filter with the ESO Schmidt telescope demonstrates the extremely slow motion of the new, distant planet CHIRON (1977 UB). The left plate was obtained on 1978 Jan. 9.05, the right on Jan. 10.05. At that time, the distance to CHIRON (from the Earth) was 2,623 million kilometres. The scale is indicated. The (near) N–S trail on the 10th is an artificial satellite.