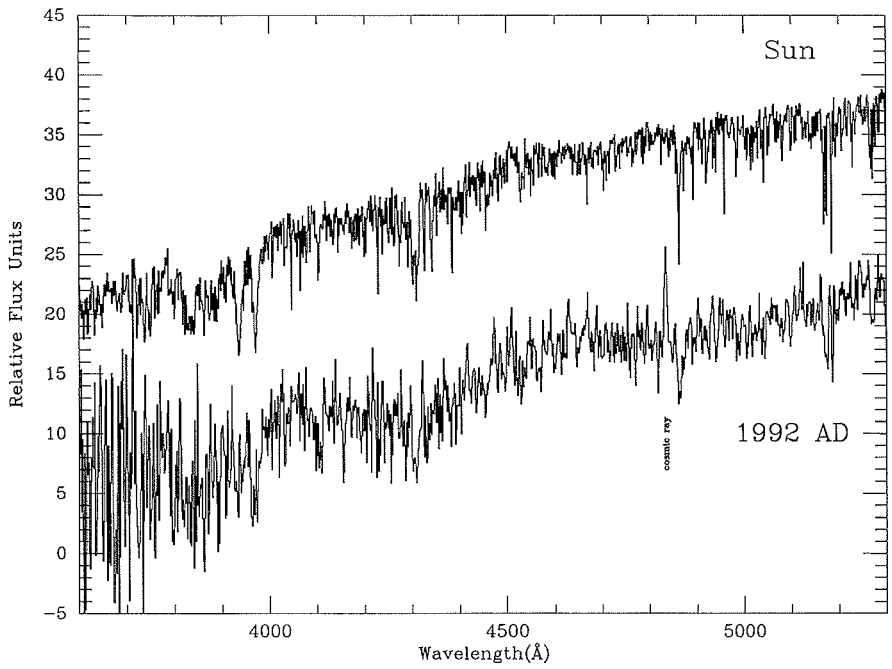

Figure 2.

ESO Observations

At ESO, three lines of investigations were initiated immediately after the announcement of the discovery.

With the Danish 1.54-m telescope, Olivier Hainaut and Alain Smette obtained deep CCD frames on February 2. In addition to measuring an accurate position, useful for improving the orbital computations, they checked whether 1992 AD has an atmosphere like is the case for Chiron since 1988. A 30-minute exposure is shown here (Fig. 1) and as can be seen, there is no sign of any diffuse "coma" around 1992 AD. In fact, by adding several CCD frames, the ESO astronomers were able to put quite low limits on any dust or gas above the surface of 1992 AD. It certainly looks completely inactive.

At the ESO/MPI 2.2-m telescope, Olivier Hainaut and Werner Zeilinger obtained a spectrum of 1992 AD, covering most of the visible region. A raw version of this spectrum is shown in Figure 2, together with the corresponding solar spectrum. Despite the rather poor response of the CCD in the UV-blue part of the spectrum, it seems clear that the overall forms of the spectra are similar, except that there may be some broad absorption structures in the spectrum of 1992 AD. No emission lines were found, so there is no indication of a gaseous atmosphere.

Thus, at least at the present time 1992 AD is dissimilar to Chiron in that it has no perceptible atmosphere.

Finally, a search was made for earlier images of 1992 AD, possibly visible on photographic plates available at the ESO Headquarters. Three ESO plates from 1977–78 and one UK Schmidt plate from 1982 were identified. A very faint trail was seen on the UKS plate.

However, when in February 1992 prediscovery images were found on Palomar plates dating from January 1991 and November 1989, a backward orbital extrapolation showed that the object on the 1982 UKS plate was not 1992 AD. But fortunately Robert McNaught from the UK Schmidt team in Coonabarabran found the right object, of magnitude ~ 20 and about 10 arcminutes distant from the other one, and he also identified 1992 AD on a 1977 UKS plate. A further verification of two ESO QBS plates from 1977 and 1978, now more accurate with the improved orbital data, still did not show the object, most certainly because the predicted blue magnitudes were 21.7 and 21.5, i.e. at the formal limiting magnitude of the ESO Quick Blue Survey.

The Importance of 1992 AD

The new minor planet moves in a part of the solar system that is largely unexplored. Only a few comets have been followed out to these distances, but the observations are very difficult and not very detailed. However 1992 AD and Chiron are bright enough to be observed over much of their orbits, especially when the new large telescopes enter into operation. They are most likely to represent the first (the brightest?) of a new class of minor planets which move in orbits beyond Saturn. Already at the time of the discovery of Chiron, it was inofficially decided that they will be given the names of mythological Centaurs, so they will supposedly be known in the future as the *Centaurs*, just like the Atens, Apollos, Amors, Hildas, etc. Now that 1992 AD has been observed in 1977, 1982, 1989, 1991 and 1992, the orbit is sufficiently well known to allow the assignment of a number and a name. No doubt the discoverers are now busy studying mythology!

In this connection, speculations have already been started about possible similarities between Chiron and 1992 AD on one side and some of the outer moons, like Triton at Neptune and Charon at Pluto, as well as Pluto itself. Are they perhaps all objects of the same basic type, but of different sizes and with different evolutionary histories? Only further observations will tell.

Nova Muscae 1991: One Year Later

M. DELLA VALLE, ESO-La Silla

X-ray novae form a subclass of low-mass X-ray binaries, which are systems usually composed of a low-mass late-type star and an accreting compact object as neutron star. For a few of them there exists the interesting possibility that the compact object may be a black hole. Thus the detection of the optical counterpart represents a first step towards the study of very compact objects in binary systems.

The X-ray transient source GRS 1121-68 was discovered by the WATCH all-sky X-ray monitor on the Soviet GRANAT satellite on January 9 (Lund and Brandt, 1991) and shortly thereafter by GINGA all-sky monitor (Makino, 1991). Its optical counterpart was furthermore identified as a star of V ~ 13.5 on a IIIa-J plate taken on January 13 with the 1-m Schmidt telescope (Della

Valle, Jarvis and West, 1991a) and later confirmed by X, and γ observations. The progenitor is barely visible on the best ESO (R) Schmidt plates (1984) with a magnitude close to the B $\simeq$ 20.8.

Because of the binarity, Nova Muscae 1991 should be observable, also when the star reverts to minimum light; this post-outburst stage represents a most important phase for elucidating the *true* nature of the compact companion.

In the X-ray novae the spectrum of the late-type companion is overwhelmed by the continuum produced by X-ray heated gas. On the other hand, at minimum light the star should be at its minimum brightness, when the fraction of light due to X-ray heating is negligible. The present NTT frame (Fig. 1), obtained on January 1, 1992, i.e. almost exactly one year after the outburst, shows that the nova has in the meantime reverted to its original brightness and is now of magnitude V = 20.5±0.1.

Nova Muscae 1991 should therefore now provide the rare opportunity to observe the spectrum of the companion star. In this way it will be possible to determine the orbital parameters and, most important, to estimate the masses of the components.

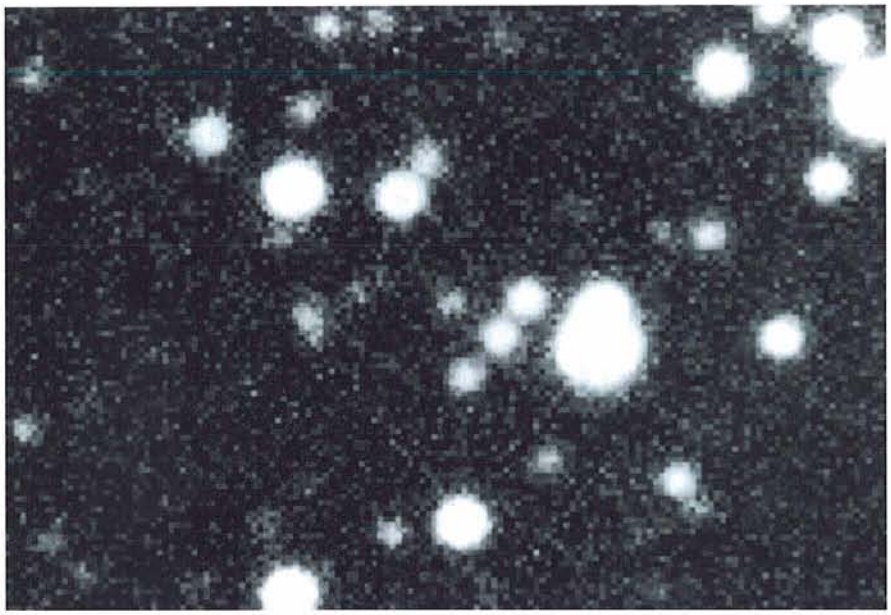

Figure 1: *Frame of Nova Muscae 1991, obtained on January 1, 1992 by E. Cappellaro with the NTT (V; 60 sec exposure). The object is at the centre of the field, just left of a chain of three stars (cf. also the images in the* Messenger, *No.* ***63****, p. 3; March 1991), and the magnitude is V = 20.5. North is up and east is to the left.*

References

Lund, N., Brandt, S. 1991, *IAU Circ.* 5161.

Makino, F., and Ginga Team 1991, *IAU Circ.* 5161.

Della Valle, M., Jarvis, B.J., West, R. 1991, *Nature,* **353**, 50.

La Silla in the Sky

Johan H. Knapen (Tenerifa, Spain) took this unusual photo of La Silla and the surrounding landscape during a visit in March 1991 to the ESO Observatory. He says: "Around midday, while I was walking from the residence to the SEST telescope, where I was observing, I was struck by the colour contrast between the traffic mirror and the blue sky, the reflection of some of the La Silla telescopes and the grand view of the desert."