AURORE SIMONNET / SSU

Astronomers recently announced a record-setting stellar-mass black hole. Located in the nearby dwarf galaxy IC 10, it makes itself known by X-ray emission from hot gas spiraling in. It orbits a large, hot star, and by luck the two pass in front of each other from our viewpoint as they revolve. By timing the star's eclipses of the X-ray source, the research team was able to determine their mutual orbit and thus the mass of the black hole. It weighs in with between 24 and 33 solar masses.

By comparison, the biggest stars in our own galaxy can produce supernova-remnant black holes with no more that 15 solar masses. Astronomers think the one in IC 10 could have acquired no more than an extra 1 or 2 solar masses from its companion. Apparently, IC 10's low proportion of heavy elements leads to beefier stellar remnants than those in the Milky Way.

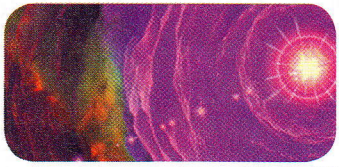
New Route to a Supernova

DIFFERENT TYPES OF SUPERNOVAE are produced by very different mechanisms. A Type Ia blast results when a dense white-

Betelgeuse: Star in a Shell

LIKE MANY RED SUPERGIANTS, brilliant Betelgeuse in Orion's shoulder changes slowly and irregularly, sometimes by a half magnitude or more from one year to the next — enough for a careful skywatcher to notice. New high-resolution measurements may help answer why the star vacillates so much.

An international team used the Very Large Telescope Interferometer in Chile to measure two main components of Betelgeuse: the star's large photosphere (visible surface) and a cooler shell of molecular gas, dubbed a "MOLsphere," glowing in the infrared and extending from 0.3 to 0.4 stellar radius above the surface.



ALEX LOBEL / CFA

Astronomers have long known that dust is moving away from Betelgeuse in all directions. The MOLsphere is apparently where the dust begins to condense in the hot stellar wind, perhaps modifying the star's light. The first solid bits to form are likely to be a glassy form of corundum (Al_2O_3). These grains could provide the nucleation sites onto which other minerals condense as the star's outflowing wind thins and cools.