

The Cygnus Loop supernova remnant. This shell spans about three degrees on the sky and is believed to be nearly 600 parsecs distant. It is the glowing diffuse remains of a star which exploded about sixty thousand years ago.



emit radiation, and so-called because it was first observed in an artificial nuclear particle accelerator known as a synchrotron). As the remnant ages it cools, the expansion slows and it becomes optically faint; after about a million years only a diffuse patch of radio emission marks the death of a star in the galaxy. The Cygnus Loop, the remnant of a supernova which exploded in our Galaxy about 10 000 years ago, is shown above.

We know supernovae are rare, only occurring about once every 100 years in our Galaxy, so we must conclude that most stars do not die with such violence, but by some other more peaceful process.

Condensed remnants

It is believed that many low mass stars end up as white dwarfs. These have cores of degenerate material, which behaves quite unlike normal material. In such a core, when the temperature becomes sufficiently high for helium core burning to begin, the subsequent rise in temperature does not cause an increase in pressure and a halt to the contraction. Instead, the temperature continues to go up and the reactions burn faster, but still the pressure does not increase. The core continues to contract and progressively heat up. The thermostatic control has