

## + Researchers

More women astronomers who have contributed to our knowledge of the stars:



**Margherita Hack**  
(Italy, 1922)

The first woman to hold the post of Director at the Astronomical Observatory of Trieste, from 1964 to 1987. Her work focussed on the atmospheres of stars and their effects on the spectra observed. Her most important contributions were on rapidly rotating stars which eject large quantities of material to form rings and envelopes around them, which are known as Be stars.



**Virginia Trimble**  
(United States, 1943)

Researcher in star and galaxy evolution and the history of astronomy. Trimble was Vice President of the International Astronomical Union and the American Astronomy Society.

### Isabelle Baraffe

French Astronomer. Worked in stellar and planetary astrophysics. Made important contributions to the study of giant planets applied to exoplanets. Also produced important work on brown dwarfs

### Françoise Praderie

French researcher at the Paris Observatory. Worked in stellar astrophysics, largely on stellar seismology. She was the first Secretary General of Euroscience, the European organisation for the advancement of science.



**Jocelyn Bell**  
(Ireland, 1942)

In 1967, whilst studying for her Doctorate, she recorded very regular and very fast radio signals at a radio telescope. No-one knew where they could have come from but Jocelyn Bell, with her Thesis Supervisor, concluded that it was a previously unknown star which must be very massive and rotating very fast. They called it a pulsar.



**Jill Tarter**  
(United States, 1944)

Has worked on a variety of programmes seeking extraterrestrial life. The novel "Contact" by Carl Sagan is based on her. She directed NASA's HRMS project which analysed 10 million radio frequencies using radio telescopes. She was also director of the Phoenix programme whose objective was to look for patterns in radio signals.

# They also die

*Stars have a beginning and an end. They are born in clouds of gas and dust, which are forced to condense by gravity.*

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Stars spend most of their lives turning the hydrogen in their nucleus into helium. This is called the Main Sequence, or MS. The amount of time they will spend in this phase depends on their initial mass. The way that they die is also determined by their initial mass.

Stars like our Sun will spend some 10,000 million years in the MS. After this they will expand to become red giants, which expel their surface layers to create a planetary nebula. At the centre of this nebula is a white dwarf, which is very small and hot and which will gradually exhaust itself.

Stars that are much more massive than the Sun will take less time to reach the end of the MS and turn into supergiants. The reactions in their nuclei produce heavy elements like iron and they end their lives in violent explosions as supernovas, expelling large quantities of material into space. The compact objects that remain after explosions like this can either be neutron stars (pulsars) or black holes.

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