



# Read

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## Who were the Herschels?

### William Herschel (1738-1822)

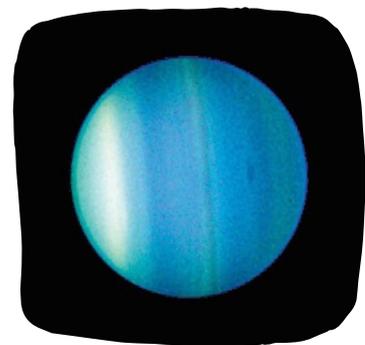
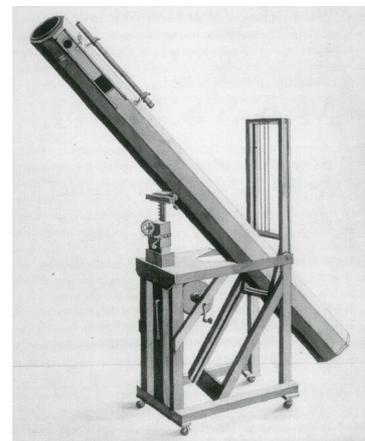


In 1777, William Herschel and his sister Caroline moved to 19 New King Street, Bath (now the Herschel Museum of **Astronomy**). William Herschel came to Bath as a musician. He held concerts and gave music lessons from his home. However, he also became obsessed with astronomy which led to one of the most important discoveries since ancient times.

Herschel was not happy with the telescopes he could buy so he decided to build his own reflecting telescopes. This was hard work as he needed to make and polish the mirrors himself. He worked night after night, sometimes not even stopping for dinner - so Caroline would feed him while he worked.

On the night of 13th March 1781, while using his home-made telescope, William Herschel spotted something that no one had seen before - it was the planet **Uranus**. This effectively doubled the size of the known solar system and made William instantly famous.

Herschel also made a 40ft long reflector telescope but it took a long time to set up and use so wasn't used as often.



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## Who were the Herschels?

### Caroline Herschel (1750 - 1848)

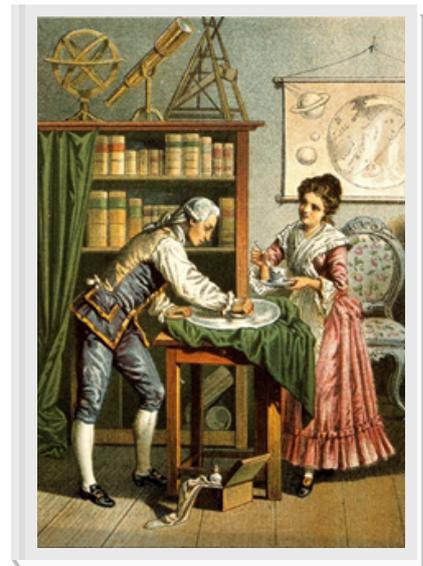


Caroline Herschel, herself a singer, moved from Germany to keep house for William and perform in his concerts.

As a child Caroline had suffered from **smallpox** and **typhus** leaving her scarred and her growth stunted; she never grew taller than 4'3". Neglected by her parents, she didn't learn to read and write until her move to England, when William tutored her.

Caroline became a strong mathematician and began to assist her brother with his astronomical work. She would record his observations of the night sky and work out complex maths calculations with his data.

Later, Caroline developed an interest in astronomy herself was responsible for discovering and documenting many **comets** and **nebula**. She was the first women astronomer to earn a salary and became an honorary member of the **Royal Astronomical Society** which women weren't allowed to be a part of. In 1828 they even awarded her the gold medal of the society.



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## What are Nebulae?

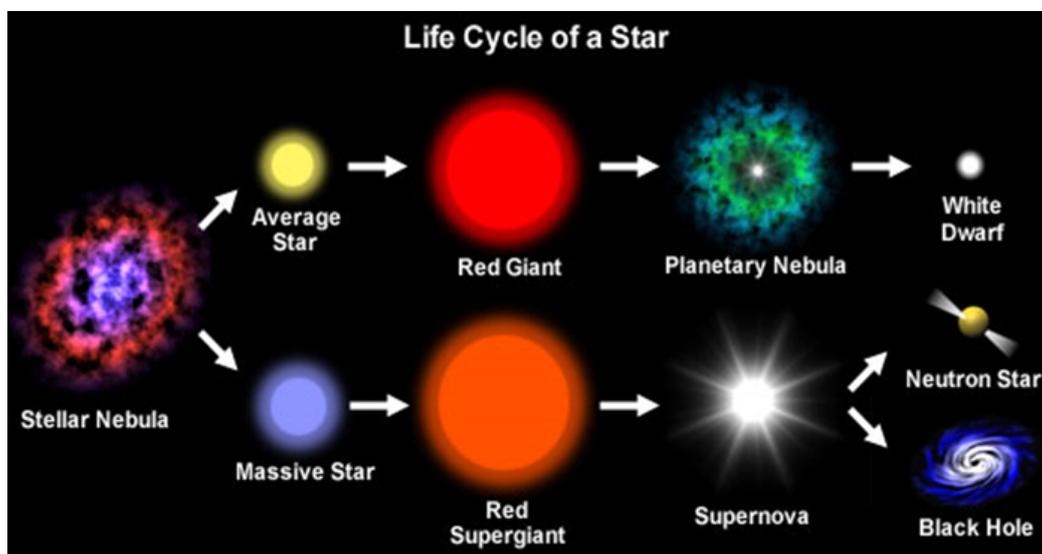


**Nebulae** are clouds of dust and gas in space. Some nebulae are created when a dying star explodes. Others help to form new stars and planetary objects. Several thousand stars can be produced from one nebula.

All stars are created in nebulae. When nebulae get very dense with gas and dust, they collapse under their own **gravitational force** and create stars.

A star's life cycle depends on its size. Massive Stars shine brightly and quickly, but last just a few hundred thousand years. They cool and expand to become **Red Super-Giants** before exploding in what is known as a **Supernova**. These explosions create **Neutron Stars** or **Black Holes**.

Average Stars, use much less energy to shine and last for several billion years. They cool slowly to become **Red Giants** and then **White Dwarfs**. The Sun is a Small Star.



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## Glossary

**Astronomy:** One of the oldest sciences in the world. The study of astronomy involves all of the objects outside Earth's atmosphere, including the sun, Moon, planets, stars, galaxies, and all other matter in the universe. People known as astronomers have studied these objects for thousands of years.

**Black Holes:** A black hole is mysterious occurrence where gravity has become so strong that nothing around it can escape, not even light.

**Comets:** A small chunk of dust and ice that orbits, or travels around, the sun. It is sometimes described as a "dirty snowball."

**Gravitational Force:** Gravity is a force of attraction that pulls together all matter (anything you can physically touch). The more matter something has, the greater the force of its gravity. That means really big objects like planets and stars have a stronger gravitational pull.

**Nebula:** A cloud of gas and dust in space. Nebulas appear in many shapes and colors.

**Neutron Stars:** A neutron star is a very small and dense star made almost completely of neutrons.

**Red Super-Giants:** A big giant star that weighs about one-half to ten times as much as our Sun. They appear to be colored red and they are very large.

**Reflective telescope:** A reflecting telescope uses mirrors instead of lenses.

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## Glossary (Continued)

**Royal Astronomical Society:** This is a group founded in 1820 that encourages and promotes the study of astronomy, solar-system science, geophysics and closely related branches of science.

**Smallpox:** a sometimes deadly disease in which fever and skin rash occur and which is believed to have been wiped out worldwide by vaccination

**Solar system:** The solar system consists of the sun and everything that orbits, or travels around, the sun. This includes the eight planets and their moons, dwarf planets, and countless asteroids, comets, and other small, icy objects.

**Supernova:** A supernova is when a huge star explodes.

**Typhus:** Typhus is the name of several diseases caused by tiny living things called bacteria.

**Uranus:** Uranus is the 7th planet from the Sun.

**White Dwarfs:** White dwarfs are the final evolutionary state of all stars whose mass is not high enough to become a neutron star. A white dwarf is a compact star. Their matter is squashed together.