Life of a Star

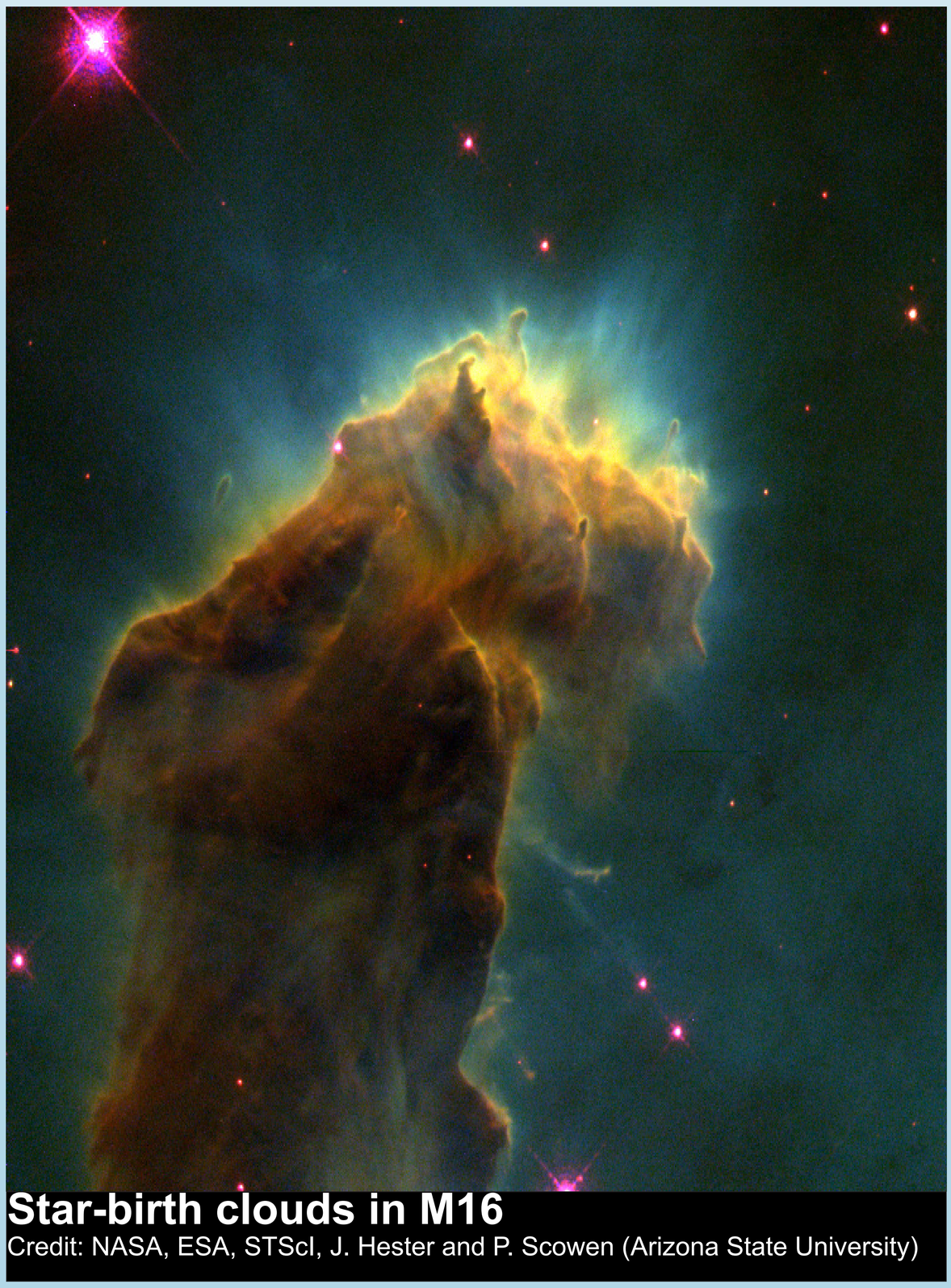
Stars may seem eternal but they are not. They grow old and then they die. But the stuff they are made of lives on...

A star is born

Stars are born inside clouds of dust and gas, which exist in the space between the stars. Inside these clouds, hydrogen atoms bond together to form hydrogen molecules (H_2). These molecules are the raw materials needed to make new stars.

Burn out or fade away

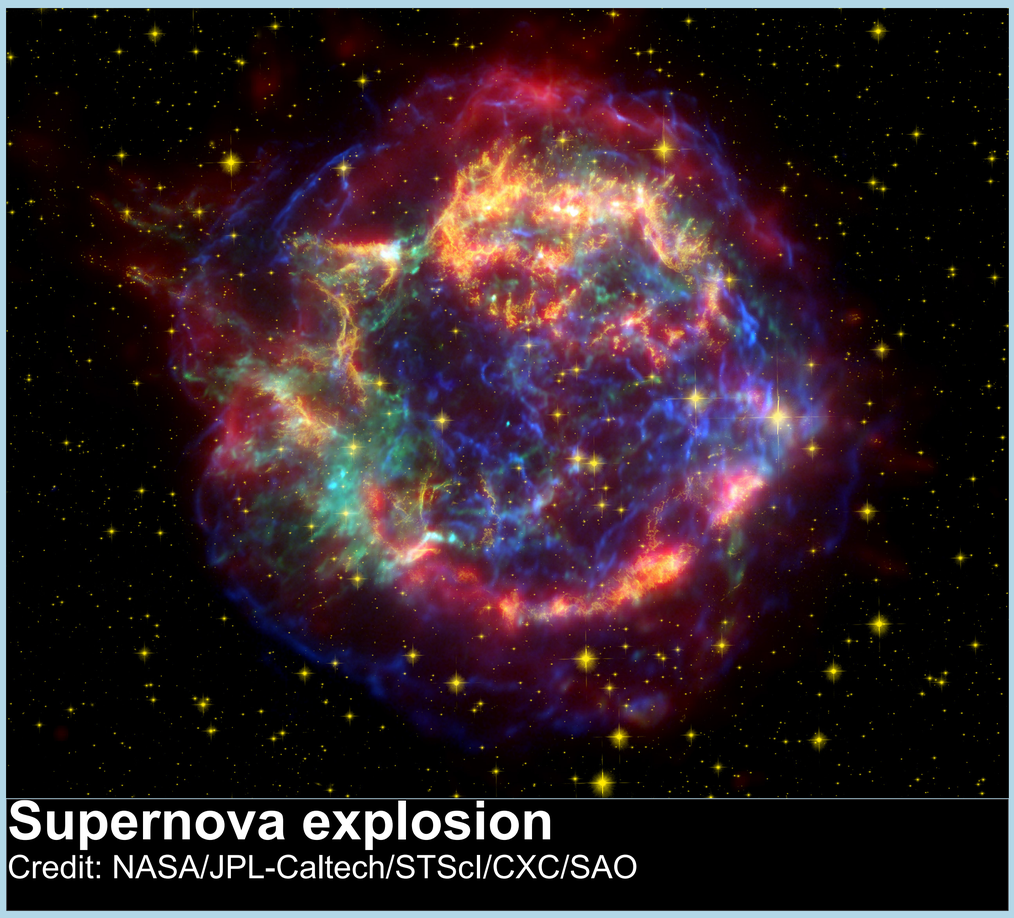
As soon as a star is born, it starts to 'burn' the stuff it is made of (such as hydrogen, helium and carbon). It does this through a process known as 'fusion'. This means that it fuses atoms together, turning lighter elements into heavier elements.



Star-birth clouds in M16
Credit: NASA, ESA, STScI, J. Hester and P. Scowen (Arizona State University)

Dying young

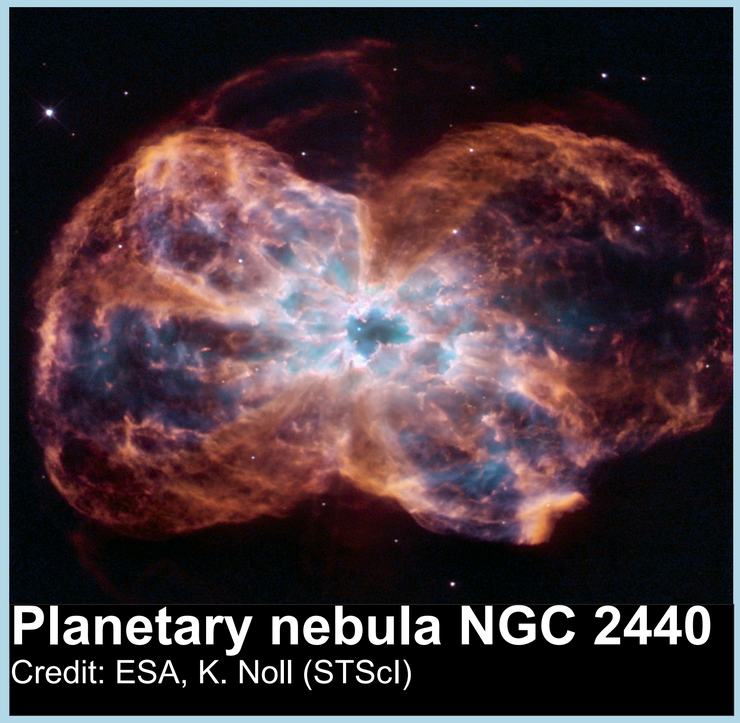
Big, heavy stars end their lives violently in what is called a Supernova explosion!



Supernova explosion
Credit: NASA/JPL-Caltech/STScI/CXC/SAO

A long life

Smaller, lighter stars, like the Earth's sun, die more peacefully. Over thousands of years, a star sheds its outer layers, forming planetary nebulae (an expanding shell of gas). Planetary nebulae play a crucial role in returning chemical material to the universe.



Planetary nebula NGC 2440
Credit: ESA, K. Noll (STScI)

Stars really are us!

When a star dies, all the material it is made from is returned to the space between the stars, where it is used to make new stars and planets. This material could even end up forming life – most of what is inside this exhibition, and even inside you, was made in the stars!

STARS *R* US!