

Young star rebels against its parent cloud

December 13 2011



This image from the NASA/ESA Hubble Space Telescope shows Sh 2-106, or S106 for short. This is a compact star forming region in the constellation Cygnus (The Swan). A newly-formed star called S106 IR is shrouded in dust at the centre of the image, and is responsible for the the surrounding gas cloud's hourglass-like shape and the turbulence visible within. Light from glowing hydrogen is colored blue in this image. Credit: NASA & ESA

Despite the celestial colours of this picture, there is nothing peaceful about star forming region Sh 2-106, or S106 for short. A devilish young star, named S106 IR, lies in it and ejects material at high speed, which disrupts the gas and dust around it. The star has a mass about 15 times that of the Sun and is in the final stages of its formation. It will soon quieten down by entering the main sequence, the adult stage of stellar life.

For now, S106 IR remains embedded in its parent cloud, but it is

rebellious against it. The material spewing off the star not only gives the cloud its hourglass shape but also makes the hydrogen gas in it very hot and turbulent. The resulting intricate patterns are clearly visible in this Hubble image.

The young star also heats up the surrounding gas, making it reach temperatures of 10 000 degrees Celsius. The star's radiation ionises the hydrogen lobes, making them glow. The light from this glowing gas is coloured blue in this image.

Separating these regions of glowing gas is a cooler, thick lane of dust, appearing red in the image. This dark material almost completely hides the ionising star from view, but the young object can still be seen peeking through the widest part of the dust lane.

S106 was the 106th object to be catalogued by the astronomer Steward Sharpless in the 1950s. It is a few thousand light-years distant in the direction of Cygnus (The Swan). The cloud itself is relatively small by the standards of star-forming regions, around 2 light-years along its longest axis. This is about half the distance between the Sun and Proxima Centauri, our nearest stellar neighbour.

This composite picture was obtained with the [Wide Field Camera 3](#) on the [NASA/ESA Hubble Space Telescope](#). It results from the combination of two images taken in infrared light and one which is tuned to a specific wavelength of visible light emitted by excited [hydrogen gas](#), known as H-alpha. This choice of wavelengths is ideal for targetting star-forming regions. The H-alpha filter isolates the light emitted from hydrogen in gas clouds while the [infrared light](#) can shine through the dust that often obscures these regions.

Provided by ESA/Hubble Information Centre

Citation: Young star rebels against its parent cloud (2011, December 13) retrieved 26 April 2024 from <https://phys.org/news/2011-12-young-star-rebels-parent-cloud.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.