

Galactic Ballet Captured by Gemini

September 14 2004



A stunning image released by the Gemini Observatory captures **the graceful interactions of a galactic ballet, on a stage some 300 million light years away**. The clarity of the image is thanks, in part, to an instrument built in the UK, the Gemini Multi-Object Spectrograph (GMOS).

The galaxies, members of a famous troupe called Stephan's Quintet, are literally tearing each other apart. Their shapes are warped by gravitational interactions occurring over millions of years. Sweeping arches of gas and dust trace the interactions and possible ghost-like passage of the galaxies through one another. The ongoing dance deformed their structures while spawning a prolific fireworks display of star formation fuelled by clouds of hydrogen gas - clumped together to

form stellar nurseries.

Image: Stephan's Quintet as imaged by the Gemini Observatory using the Multi-Object Spectrograph on Gemini North. The interacting members of the cluster are almost 300 million light years away. The galaxy NGC 7320 (top-centre) is thought by most astronomers to be in the foreground (about one eighth of the distance closer) and is distinguished in this image by multiple red blobs indicating hydrogen clouds where stars are forming. Orientation: North-bottom, East-right. Credit: Gemini Observatory/Travis Rector, University of Alaska, Anchorage.

This unprecedented image of the cluster provides a unique combination of sensitivity, resolution and field of view. "It doesn't take long to reach an incredible depth when you have an 8-metre mirror collecting light under excellent conditions," said Travis Rector of the University of Alaska, Anchorage who helped obtain the data with the Gemini North Telescope on Mauna Kea, Hawaii. "We were able to capture these galaxies at many different wavelengths or colours. This allowed us to bring out some remarkable details in the final colour image that have never been seen before in one view."

The GMOS instrument, which was built as a joint partnership between the UK Astronomy Technology Centre (UK ATC), University of Durham and the Hertzberg Institute of Astrophysics in Canada, is capable of obtaining hundreds of spectra in a single "snapshot" - enabling the study of galaxies at vast distances, as well as delivering high resolution images of this nature.

Dr Adrian Russell, Director of the UK ATC, adds, "The success of instruments like GMOS shows why the UK is at the forefront of world astronomy. This particular image demonstrates the exquisite detail that can be achieved when you use a state-of-the-art instrumentation to exploit an 8-metre class telescope on a great site."

One striking element of the image is a collection of vibrant red clumps that mark star-forming regions within one of the galaxies - NGC 7320. Although its relation to the other galaxies in the cluster has been the subject of some controversy, most astronomers now think that the galaxy leads a relatively tranquil existence in the foreground, safely isolated from the violent quarrels of the more distant cluster. See notes to editors for further information about the image.

Source: PPARC

Citation: Galactic Ballet Captured by Gemini (2004, September 14) retrieved 25 April 2024 from <https://phys.org/news/2004-09-galactic-ballet-captured-gemini.html>

<p>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.</p>
--