

# WHY DO URANUS AND NEPTUNE HAVE DIFFERENT COLOURS?

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Neptune and Uranus have much in common — they have similar masses, sizes, and atmospheric compositions — yet their appearances are notably different. At visible wavelengths Neptune has a distinctly bluer colour whereas Uranus is a pale shade of cyan. Astronomers now have an explanation for why the two planets are different colours.

Using observations from the Gemini North telescope, the NASA Infrared Telescope Facility, and the Hubble Space Telescope, researchers have developed a single atmospheric model that matches observations of both planets. New research suggests that a layer of concentrated haze that exists on both planets is thicker on Uranus than a similar layer on Neptune and ‘whitens’ Uranus’s appearance more than Neptune’s. The model reveals that excess haze on Uranus builds up in the planet’s stagnant, sluggish atmosphere and makes it appear a lighter tone than Neptune. If there were no haze in the atmospheres of Neptune and Uranus, both would appear almost equally blue.

This conclusion ( *Journal of Geophysical Research: Planets*) comes from a model that an international team led by Patrick Irwin, Professor of Planetary Physics at Oxford University, developed to describe aerosol layers in the atmospheres of Neptune and Uranus. Previous investigations of these planets’ upper atmospheres had focused on the appearance of the atmosphere at only specific wavelengths. As per a press release from the Association of Universities for Research in Astronomy, this new model, consisting of multiple atmospheric layers, matches observations from both planets across a wide range of wavelengths. The new model also includes haze particles within deeper layers that had previously been thought to contain only clouds of methane and hydrogen sulphide ices.

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