

Hidden Universe | Gallery Explorer

The Art of Exoplanets

(b) While astronomers have identified over 500 planets around other stars, they're all too small and distant to fill even a single pixel in our most powerful telescopes. That's why science must rely on art to help us imagine these strange new worlds.

(c) Even without pictures of these exoplanets, astronomers have learned many things that can be illustrated in artwork. For instance, measurements of the temperatures of many "Hot Jupiters," massive worlds orbiting very close to their stars, hint that their atmospheres may be as dark as soot, glowing only from their own heat.

(d-e) While "Hot Jupiters" would be relatively dark in visible light, compared to their stars, their brightness is proportionally much greater in the infrared. Illustrating this dramatic contrast change helps explain why the infrared eye of NASA's Spitzer Space Telescope plays a key role in studying exoplanets.

(f-g) As our understanding evolves, so must the artwork. Astronomers found a blazing hot spot on the exoplanet Upsilon Andromedae b that at first, appeared to face towards its star. More data has revealed that the hottest area is actually strangely rotated almost 90 degrees away, near the day/night terminator.

(h) WASP 12b is as hot as the filament in a light bulb, and would be blazing bright to our eyes. Most interestingly, if it proves to have a strongly elliptical orbit, as first thought, calculations show it would be shedding some of its outer atmosphere into a gassy disk around its star.

(i-j) Computer simulations of HD 80606 b, constrained by global infrared measurements, are helping astronomers to better understand the details of how its atmosphere circulates. These computations can feed back into the artwork helping us produce more plausible illustrations.

(k) The closest known exoplanet is 10 light years away in the Epsilon Eridani system. Excess infrared light found here by Spitzer has led astronomers to conclude it also has two asteroid belts, hinting at the possibility of other small, rocky worlds.

(l) Perhaps the strangest known planetary system orbits the pulsar PSR B1257+12, the neutron star remnant of a supernova. Astronomers have detected three planets that either survived the explosion, or formed afterwards in this region filled with spinning magnetic fields and hostile radiation.

(m) Until the day we can explore other star systems as thoroughly as our own, exoplanet art inspired by the real science will help fill in the gaps in our imagination.