Hubble Sees Evaporating Planet Getting the Hiccups

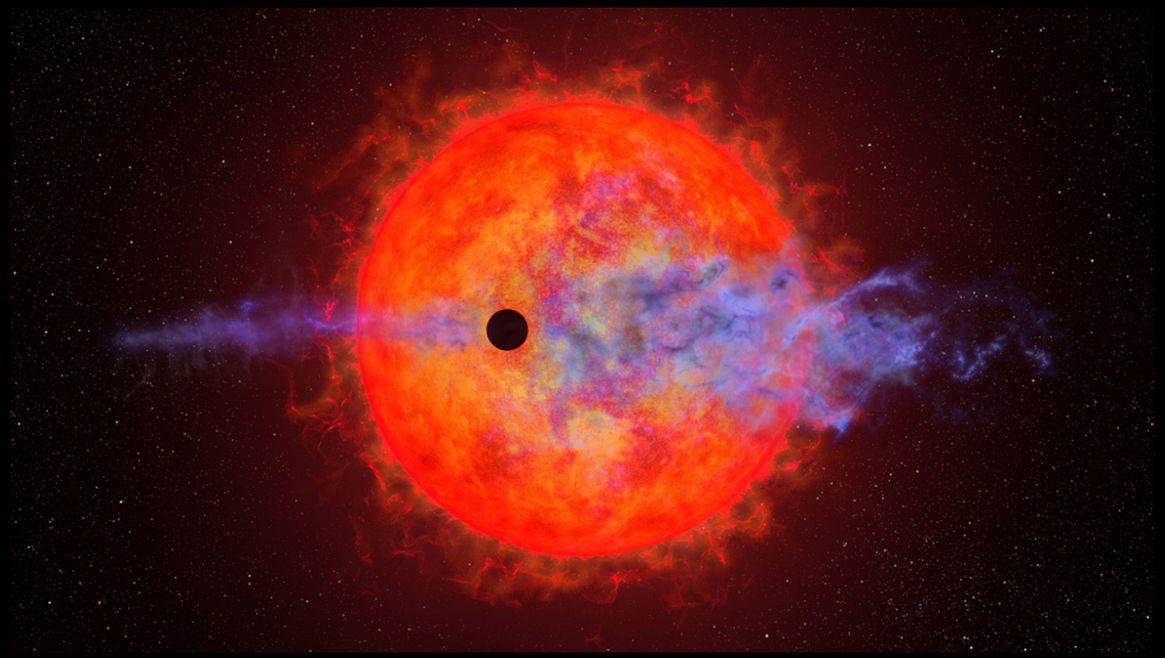
A young planet, called AU Mic b, is changing in unpredictable ways orbit-by-orbit around its red-dwarf host star. The world experiences a consistent, torrential blast of energy that evaporates its hydrogen atmosphere – causing it to puff off the planet.

NASA's Spitzer and TESS satellites discovered AU Mic b in 2020. When Hubble first observed the planet, also in 2020, it looked like it wasn't losing any material. A year and a half later, however, a second observation showed clear signs of atmospheric loss.

The never-before-seen changes in atmospheric outflow from AU Mic b may indicate swift and extreme variability in the host red dwarf's outbursts. One possible explanation for the missing atmospheric material is that a powerful stellar flare, seen seven hours prior, may have photoionized the escaping hydrogen to the point where it became transparent to light, and so was not detectable.

Red dwarfs are the most abundant stars in our Milky Way galaxy. They therefore should host most planets. But scientists wonder if worlds orbiting red dwarfs, like AU Mic b, can be hospitable to life when they're exposed to such withering radiation.

Goddard manages both the Hubble and TESS missions.



This artist's illustration shows a planet (dark silhouette) passing in front of a red dwarf star. The planet is so close to the eruptive star a ferocious blast of stellar wind and blistering ultraviolet radiation is heating the planet's hydrogen atmosphere, causing it to escape into space. The illustration is based on measurements of planet AU Mic b made by the Hubble Space Telescope. Credit: NASA, ESA, and Joseph Olmsted (STScI)

Paper: https://iopscience.iop.org/article/10.3847/1538-3881/ace536
Story: https://www.nasa.gov/feature/goddard/2023/hubble-sees-evaporating-planet-getting-the-hiccups