

P49a

Discovery of Exoplanet Candidates Orbiting a Sun-Like Star: Inaugural Observations with Subaru's New Instrument HiCIAO

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The first observations with the world's newest planet-hunter instrument on the Subaru Telescope, HiCIAO (High Contrast Instrument for the Subaru next generation Adaptive Optics), have revealed a companion to the Sun-like star GJ 758. With an estimated mass of 10-40 times Jupiter's mass, GJ 758 B is either a giant planet or a lightweight brown dwarf. Its orbit is comparable in size to Neptune's, and its temperature of 600 K makes it the coldest companion to a Sun-like star ever resolved in an image. A second companion with a similar mass at the Uranus's orbit is also suggested. The presence of such massive planets at these large distances challenges standard assumptions about planetary system formation based on the Solar System. Since a strategic search for exoplanets and their formation sites (the SEEDS project) at the Subaru Telescope has just started, further observations will eventually answer questions about whether the Solar System is ubiquitous or not.