



## Matthew Kenworthy

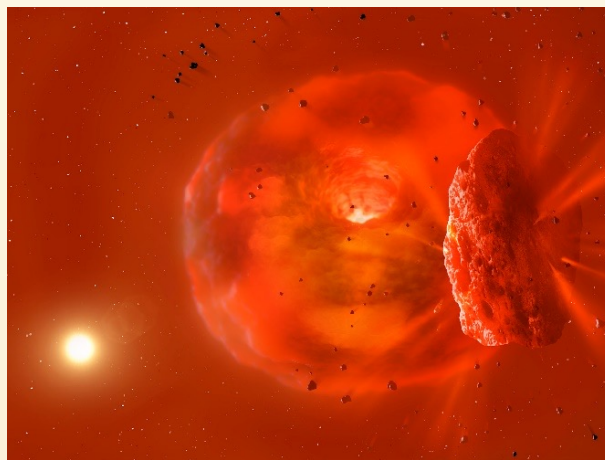
Leiden Observatory,  
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### When Worlds (probably) collide! The amazing story of ASASSN-21qj

Evidence of giant impacts can be seen across our Solar system: the tilt of Uranus, the high metal content of Mercury, and the formation of the Earth/Moon system are all thought to be due to these incredibly energetic, stochastic events. In exosystems, the mass-radius systematics of such systems have been attributed to giant impact processes.

In 2019, the young ( $\sim 300$  Myr), solar-like star, ASASSN-21qj underwent a substantial brightening in the infrared of 0.4 magnitudes at 3.8 microns (WISE W 1) and 0.8 magnitudes at 4.5 microns (WISE W2) followed some 900 days later by a complex and deep optical dimming event. Before these events, the star had shown no variation in any of these photometric bands - we argue that these observations are consistent with a collision between two giant ice exoplanets of tens of Earth masses between 2 to 16 AU from the star. This impact produced a hot, highly-extended post-impact body which radiates at about 1000K and produced the observed infrared emission.

In this talk I'll detail our investigation of this fascinating system, and say what we can discover with our recently awarded Cycle 3 James Webb Space Telescope observations.



**Tuesday, 16.04.2024, at 16:30 h, HS C (Technik)**

Innsbruck Physics Colloquium,  
Organisation: K. Erath-Dulitz, H.-C. Nägerl, T. Schrabback