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## The Juno Spacecraft Catches a Jupiter Family Comet by the Tail

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During cruise from Earth to Jupiter, an attitude-sensing star camera scanned the sky in search of objects large and small. That star camera is part of the Advanced Stellar Compass (ASC), a subsystem of the Magnetometer Investigation charged with providing accurate attitude information at the end of Juno's magnetometer boom. The main objective of the cruise observation was to search for smaller, unregistered, solar system objects, but quite unexpectedly the system recorded a great many tiny objects ejected from the spacecraft by the impact of high velocity interplanetary dust particles (IDP). This led to the first ever comprehensive profiling of IDPs from 0.88 to 5.2 AU near the ecliptic plane. We observed a rich IDP population between 1.2AU and the 4:1 mean motion resonance with Jupiter near 2.1AU, and in the Kirkwood gaps, the IDP population drops to near zero beyond the 2:1 mean motion resonance with Jupiter at 3.3AU. However, a hundredfold increase in dust impacts with the spacecraft occurred during a 15-day period in December 2015, shortly before entering the Jovian system. We have identified this event with Juno's passage through a Jupiter family comet tail. Detailed analysis demonstrates that the comet dust population we observed is characterized by cometary dust particles (CDPs) with a beta in the range of 2-10%. Subdued comet activity far from the Sun frustrates direct observations of the comet tail from Earth; however, our analysis shows that the tail evolution is still dominated by non-gravitational forces acting on particles of a few to tens of micrometers. We present the in-situ comet tail observations and couple these to the complex evolution of comet activity and dust tail dynamics.