



## **CASTAway: A mission to map the evolution of our Solar System**

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CASTAway is a mission concept to explore our Solar System's main asteroid belt. Asteroids and comets provide a window into the formation and evolution of our Solar System and the composition of these objects can be inferred from space-based remote sensing using spectroscopic techniques. Variations in composition across the asteroid and comet populations provide a tracer for the dynamical evolution of the Solar System. The mission combines long-range (point source) telescopic survey of over 10,000 objects, targeted close encounters with 10 – 20 asteroids and serendipitous searches into a single concept. With a carefully targeted trajectory that loops through the main asteroid belt, CASTAway will provide a comprehensive survey of the main belt at multiple scales. The scientific payload comprises a 50cm diameter telescope that includes an integrated low-resolution ( $R=30 - 100$ ) spectrometer and visible context imager, a thermal (e.g. 6-16 micron) imager for use during the flybys, and modified star tracker cameras to detect small ( $\sim 10$  m) asteroids. The CASTAway spacecraft and payload has high levels of technology readiness and fits within the programmatic and cost caps for an European Space Agency "M" or medium class mission, whilst delivering a step change in knowledge of our Solar System.