Where to next? The case for exploring Main Belt Comets

The Main Belt Comets are a recently discovered population that reveal that there is ice in the asteroid belt. They have relatively circular asteroid-like orbits, which are stable over long periods, and are dynamically distinct from the Jupiter family or long period comets. Around 20 'active asteroids' are now known, with 5 seen to have repeated activity each orbit, implying sublimation driven activity. This population is important for constraining dynamical models of Solar System formation, as models must place enough water into the asteroid belt to form the MBCs. I will discuss what is known about MBCs to date, and present plans for a Rosetta-like mission, called Castalia, to visit a MBC and make direct measurements of dust and gas composition, including measuring isotopic ratios that can reveal more about the MBC formation location in the proto-planetary disc, along with detailed exploration of the surface and subsurface structure.