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Meteorites: impact and damage. An inside view of asteroidal microstructure DAVID EASTWOOD, SERAFINA GARCEA, SAM MCDONALD, University of Manchester, KATE DOBSON, University of Durham, RHIAN JONES, JENNY WOODS, NEIL BOURNE, University of Manchester, CHRISTOPH RAU, Diamond Light Source, GEORGE T. GRAY III, Los Alamos National Laboratory — __Meteorites provide an important window into the formation and evolution of the solar system and planets. Chondrite meteorites preserve a record of the epoch when the solar system consisted of a cloud of dusty gas surrounding the newly formed Sun, as well as recording 4.6 billion years of geological history on asteroids. From meteorite studies we know that many asteroids contained water when they first accreted. In many cases this water later melted and flowed through the rock, leaving evidence of its tracks in the remaining minerals. Water and other fluids dissolved some of the original material, leaving void spaces. We have used tomography to assess the extent to which the original components of chondrites were affected by dissolution, by observing the nature and distribution of the resulting void space. Tomography allows us to assess the relative abundances of each to the overall porosity, and to visualize connectivity through pore space. Based on such information we can hypothesise about the agglomeration processes and the effect of impact processes on asteroid formation and microstructure.

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