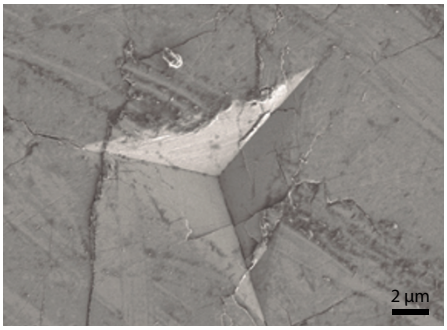
PUBLISHED: 17 FEBRUARY 2017 | VOLUME: 1 | ARTICLE NUMBER: 0076

research highlights

METEORITES

Poking a fallen object

Astrophys. J. **835,** 157 (2017)



AAS/IOP

The Chelyabinsk meteorite became a media celebrity after the videos of its explosion in mid-air, occurring in February 2013 near the homonymous city, went viral on social networks. This extensive media coverage contributed to raising awareness of the risks linked to near-Earth asteroids even of relatively small dimensions (Chelyabinsk had a radius of ~20 m; small compared with the 10-km-sized object that caused the extinction of the dinosaurs). It is thus fitting that the Chelyabinsk meteorite could help to protect us from such events.

One of the ways to deflect an incoming meteorite is to hit it with a small projectile to change its orbit. However, the final result depends strongly on its physical characteristics. Carles Moyano-Cambero and colleagues determine the mechanical properties of pieces of Chelyabinsk, characterized by different lithology, by performing non-intrusive microscopic indentation on them in the laboratory (pictured) at the Institute of Space Sciences in Barcelona (CSIC-IEEC) and comparing the response with control samples of different composition and internal structure.

Moyano-Cambero *et al.* find that an impacting deflector would be more efficient if it hit a near-Earth object in an area of light-coloured materials, which could be distinguished from other regions by means of a close-up spectroscopic survey. In addition, shock-melt veins are a structural weakness particularly responsive to impact projectiles.

Luca Maltagliati