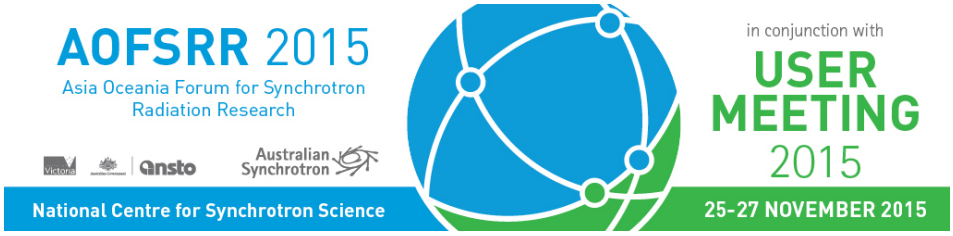

Contribution ID : **178** Type : **Poster**

Synchrotron scanning fundamentally changing how dinosaurs and other vertebrates can be both studied and "excavated" from embedding rock.

Friday, 27 November 2015 13:30 (45)

Scanning of the small dinosaur Leaellynasaura amicagraphica at the Australian Synchrotron is making possible the eventual reconstruction of its entire skeleton. Embedded in extremely hard rock, its bones are simply too fragile to ever physically extract from rock. However, by making a 3D rapid prototype print of the scanned bones, it will be possible to reconstruct a skeletal mount for study and display. Currently disarticulated, it will be possible to reconstruct the skull by manipulation of 3D rapid prototypes of the various preserved components.

Microscanning of tiny teeth of mammals contemporaneous with Leaellynsaura and other South Polar dinosaurs dinosaurs has permitted production of 3D rapid prototype prints X10 natural size, facilitating both their study and exhibition. Particularly critical, such scans have also made possible precise measuring of fossils still partially embedded in the rock.

The same scan data have been used for non-destructive histological investigations of the internal structure of mammalian teeth - specimens so rare that such investigation was previously impossible.

From the perspective of a vertebrate palaeontologist, the technological advance most sought is the advancement of methods to automatically differentiate between fossils and rock automatically. At present, manual processing of literally thousands of slices is often required simply because the density contrast between fossils and the surrounding rock is not great enough with current techniques to automate this critical step. The 3D prints currently produced in this laborious way provide a unique understanding of the morphology, not possible using any other known technique.

Keywords

3D prints dinosaurs histology morphology

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Session Classification : Poster Session 2

Track Classification : Imaging