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# High-resolution high throughput thermal neutron tomographic imaging of fossiliferous cave breccias from Sumatra

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We employ high-throughput thermal-neutron tomographic imaging to visualise internal diagnostic features of dense fossiliferous breccia from three Pleistocene cave localities in Sumatra, Indonesia. We demonstrate that these seemingly homogeneous breccias are an excellent source of data to aid in determining taphonomic and depositional histories of complex depositional sites such as tropical caves. X-ray Computed Tomographic (CT) imaging is gaining importance amongst palaeontologists as a non-destructive approach to studying fossil remains. Traditional methods of fossil preparation risk damage to the specimen and may destroy contextual evidence in the surrounding matrix. CT imaging can reveal the internal composition and structure of fossils contained within consolidated sediment/rock matrices prior to any destructive mechanical or chemical preparation. Neutron tomography (NT) provides an alternative contrast to X-rays, and in some circumstances, is capable of discerning denser matrices impenetrable to or yielding no contrast with CT imaging. High throughput neutron imaging reduces neutron fluence during scanning which means there is less residual neutron-induced radioactivation in geological samples; allowing for earlier subsequent analyses. However, this approach remains unutilised in palaeontology, archaeology or geological surveys. Results suggest that the primary agents in the formation of the breccias and concentration of incorporated vertebrate remains are several rapid depositional phases of water and sediment gravity flow. This study highlights the potential for future analyses of breccia deposits in palaeontological studies in caves around the world.

## Level of Expertise

Student

## Presenter Gender

Woman

## Pronouns

She/Her

## Which facility did you use for your research

Australian Centre for Neutron Scattering

## Students Only - Are you interested in AINSE student funding

Yes

## Do you wish to take part in the Student Poster Slam

No

## Condition of submission

Yes

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