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## The first detailed cranial description of *Massospondylus carinatus* using a CT scan and 3D digital reconstruction

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*Massospondylus carinatus* Owen, 1854 is a basal sauropodomorph dinosaur from the Late Triassic to Early Jurassic. It was one of the first dinosaurs ever described and is emblematic of the importance of South African palaeontology to the study of dinosaur evolution. *Massospondylus* was the dominant large herbivore of its time and is represented by an array of well-preserved specimens. Surprisingly, there is a lack of detailed cranial descriptions for this taxon, and this has hampered comparisons with other sauropodomorph taxa. For example, the braincase and vertebrae were described as of 1854, whereas the skull was only briefly described in 2004. In fact, there are no cranial autapomorphies which have been set to clearly differentiate *Massospondylus* from its sister taxa. Most *Massospondylus* specimens are preserved in a mudstone matrix that makes preparation of fine-scale skull features difficult, therefore understanding its cranial anatomy requires advanced imaging techniques. The aims of this project were to produce a 3D representation of the skull and braincase of *Massospondylus*, describe its cranial anatomy (including internal structures) and compare this to the skull of other sauropodomorphs. These data are then used to establish cranial autapomorphies of *Massospondylus*, test its phylogenetic position by comparing it to related taxa, and form a strong basis for future studies of the growth and development of this important dinosaur taxon. *Massospondylus* is the only sauropodomorph for which a complete size series is known, therefore using these new data in conjunction with scans of the other skulls could allow for the understanding of brain development and how the skull bones change during growth.

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Maybe

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