



Contribution ID: 28

Type: **not specified**

## How synchrotron scanning changed the evolutionary history of sense organs in mammals and their ancestors

*Thursday, 17 November 2022 15:00 (30 minutes)*

It has long been assumed that mammalian ancestors, the “mammal-like reptiles”, had primitive sense organs and nervous system, i.e. they had a small brain, simple behaviour, and unrefined sense of smell, sight, touch, hearing and olfaction. In the last 10 years, however, systematic synchrotron and CT scanning of dozens of these “mammal-like reptile” fossil skulls have unraveled a great neurological diversity. We found evidence that whiskers and enhanced olfaction, hearing, and vision likely evolved before the origin of mammals. Neurological and fossil evidence indicate that complex behaviour such as parental care and gregariousness were also commonplace in “mammal-like reptiles”. Finally, the brain itself was no smaller in “mammal-like reptiles” than in early mammals.

As dinosaurs and other Mesozoic reptiles were becoming the dominant species in terrestrial ecosystems, “mammal-like reptiles” adapted to a nocturnal way of life, which resulted in a sensory revolution. Enhanced olfaction, audition, and touch compensated for the loss of vision, which altered sensory input to the brain. The whole nervous system thus began evolving towards “mammalness” millions of years before the first mammal appeared.

**Primary author:** BENOIT, Julien (Evolutionary Studies Institute, WITS, Johannesburg)

**Presenter:** BENOIT, Julien (Evolutionary Studies Institute, WITS, Johannesburg)

**Session Classification:** AfLS Contribution

**Track Classification:** AfLS