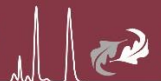


CT Scanner

CAF



Central
Analytical
Facilities

STELLENBOSCH UNIVERSITY

CT NEWS

The *Stellenbosch CT scanner facility* newsletter
"more than just a scan"

July/August 2017

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Training 28 Aug – 1 Sept

Training will be offered at the end August for new and experienced users, in specific types of analysis methods.

Come learn and upgrade your 3D imaging skills, to make the most of your data! See our brochure here and book your spot today (spots limited due to space on PCs):

<http://blogs.sun.ac.za/ctscanner/files/2013/07/Training-Brochure-Aug2017.pdf>

Welcome

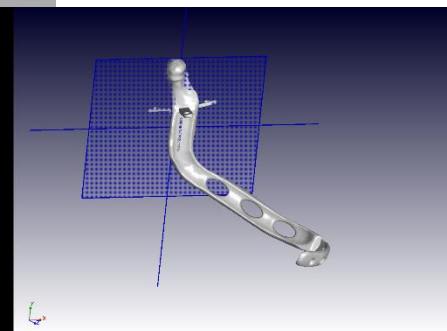
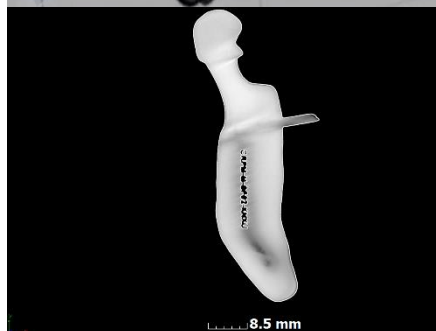
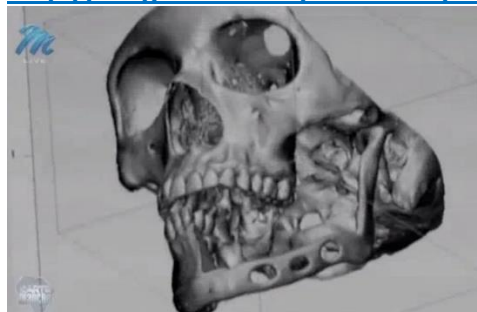
In this newsletter – recent examples & August training courses! Enjoy the news and if you need microCT for your research or to improve your production processes, contact us today.

Please take a minute to review us on google:
<https://goo.gl/maps/PD6DbGc78sR2>

Additive manufactured implants tested

In some exciting work by colleagues at Central University of Technology, custom medical implants were produced by additive manufacturing and successfully implanted in patients from disadvantaged backgrounds. The whole story aired on the TV show Carte Blanche, and our facility provided the integrity testing of the parts, ie. Making sure there are no defects. There is a short video showing the microCT analysis of the parts prior to implantation. See a high quality version of the analysis here:

<http://blogs.sun.ac.za/ctscanner/medical-implant-testing/>



MicroCT scan of additive manufactured jawbone implant, for the TV story you can view it here (not for sensitive viewers):

<https://carteblanche.dstv.com/3d-face-implants/>

Online bookings

Please book your session online for microCT, nanoCT or analysis PCs. We book in 4 hr slots for simplicity, or submit your samples to our queue. If you are a new user, first create a user number on our system:

<http://www0.sun.ac.za/safmachform/machform/view.php?id=73618>

The booking system:

http://www.supersaas.com/schedule/CAF_Booking_systems/CT_Facility

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Bosman Street, Stellenbosch
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www.sun.ac.za/ctscanner

We are members of IntACT, the International Association for Computed Tomography

<http://www.intact-tomo.org/>

Google reviews: please take a minute to review our service on google:

<https://goo.gl/maps/F8X5EzjGek32>

Youtube channel: we have two videos meant to assist you in your data viewing and analysis, have a look here:

https://www.youtube.com/channel/UCXFX_JBZVAewNE3JqM1grYA

“Striking” journal cover image

MicroCT imaging is sometimes very visually impressive, so we hope this is the first of many journal cover images from our facility. This one is related to a study published where different snake fangs are compared using microCT-based simulations. Read the paper here:

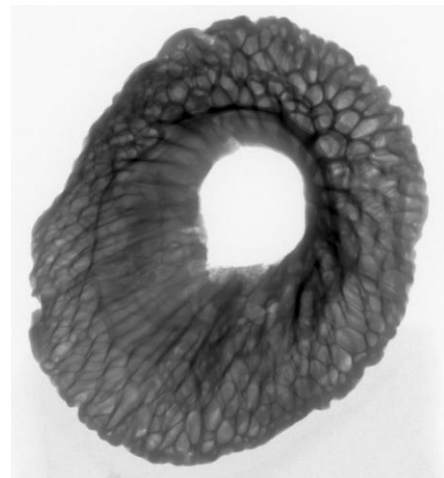
<http://rsbl.royalsocietypublishing.org/content/13/8/20170293>



Figure 1: This image of a puff adder featured on the cover of the August 2017 issue of *Biology Letters*

Guess-the-X-ray

To highlight the capabilities of our systems to really look into and through parts, we regularly show some X-ray images. The idea is you can try to guess what it is and why we are analyzing it. In the last newsletter it was a snake, which now is shown in CT in the example above. The new one for this month:



What do you think this X-ray is?

Our advertiser is Volume Graphics – their software VGStudioMax is used extensively at our facility. For a link to their free 3D viewer (also now for Mac), click here:

<https://www.volumegraphics.com/en/download-viewer.html>

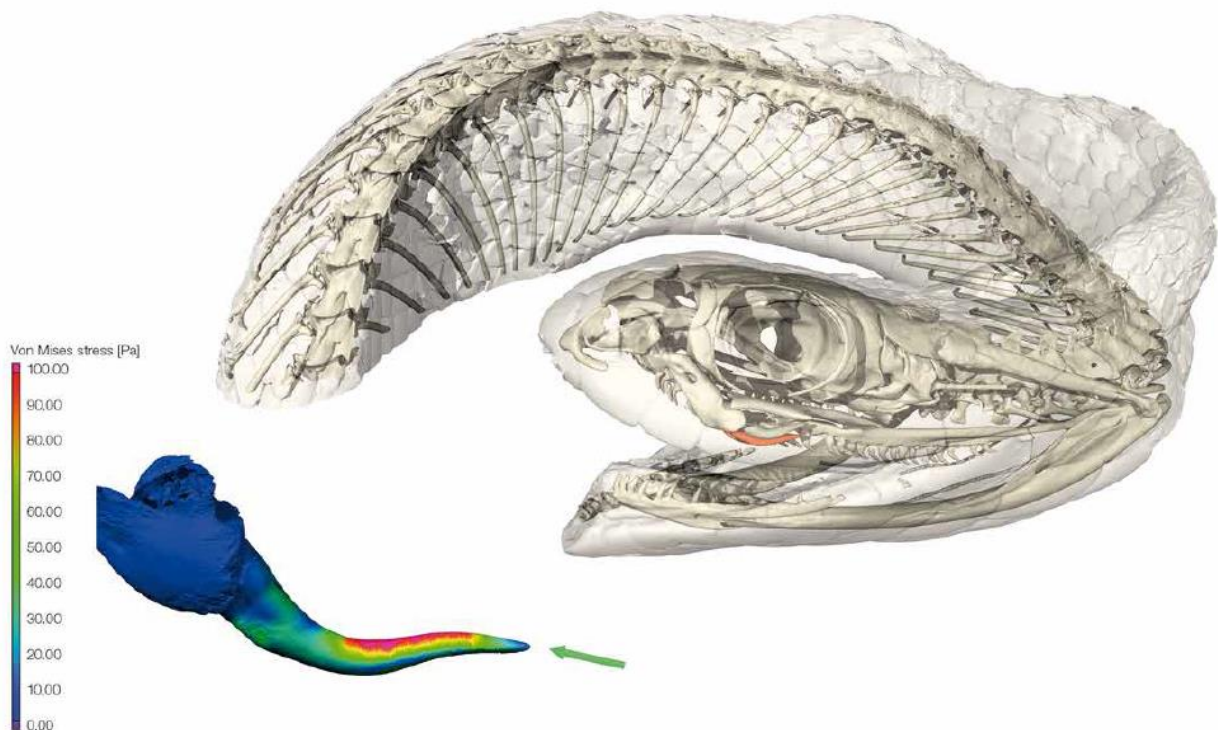
Acknowledgements

The CT scanner equipment acquisitions were made possible with grants from the National Research Foundation and Stellenbosch University. The Department of Science and Technology Internship program is also acknowledged for its support of this facility. We encourage and welcome any form of sponsorship or support in order to keep delivering the best quality.

Please cite our facility when reporting data generated here:

<http://www.sciencedirect.com/science/article/pii/S0168583X16303433>

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Structural Mechanics Simulation

with VGSTUDIO MAX 3.0 in Scientific Use

With the Structural Mechanics Simulation Module for VGSTUDIO MAX, you can perform virtual stress tests directly on your scanned object. Calculate and visualize force lines, local displacements, and failure-related variables such as von Mises stress or the absolute maximum principal stress.

Uses in Biology

- > *Causus rhombeatus* [1]: The Structural Mechanics Simulation Module was used to simulate the bite force on different tooth types of the venomous viper from sub-Saharan Africa. Direct force was applied to the tip of the fang.
- > This simulation showed that the von Mises stress of a fang is notably lower than when the same force is applied to a standard tooth, leading to the conclusion

that fangs – which are much larger than standard teeth – can withstand a significantly higher load. This type of analysis helps scientists to understand how fang morphology adapts to withstand bite forces, how this relationship differs between fang types, and whether it relates to the feeding behaviors of the respective snakes.

[1]: Data from du Plessis, A., le Roux, S. G., & Broeckhoven, C. (2016), Scan by: Stellenbosch CT Scanner Facility (Contact: Du Plessis, A.; anton2@sun.ac.za)