CT Scanner
CAF Central Analytical Facilities
STELLENBOSCH UNIVERSITY

CT NEWS

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

May/June 2017

In This Issue

Upcoming conference

Please note the 3rd edition of the IMGRAD conference (IMaGing with RADiation) will be held in September at Wits, please see the call for abstracts here: http://ancient-earth.co.za/upcoming-events/

Abstract deadline is 30 June, take this opportunity to present your microCT results to a growing community of radiation imaging scientists and students.

Register for a unique CAF user number!

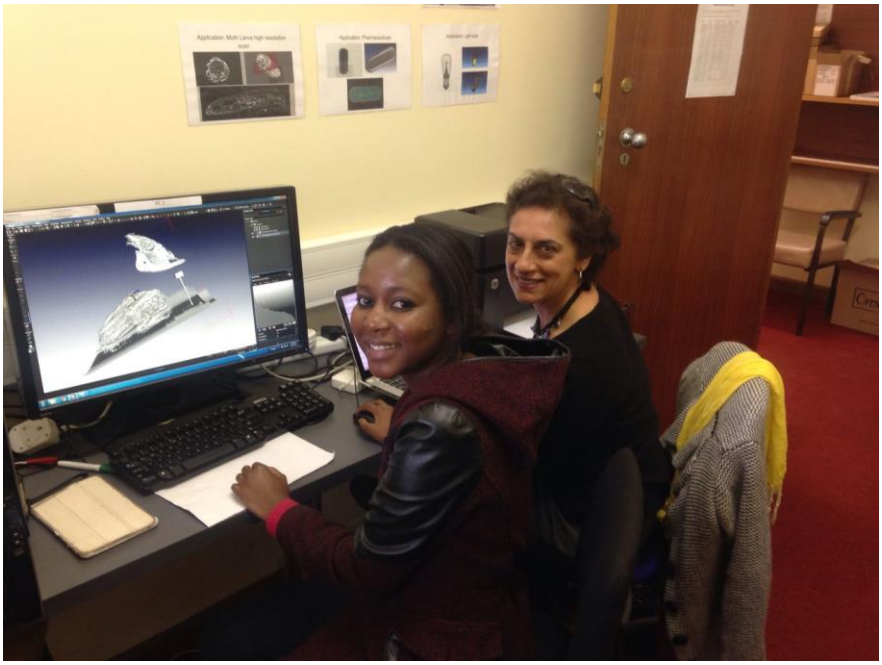
Please fill in the quick form to capture your details on our system, this allows you to make online bookings and ensures your work is not delayed by admin. Click here now:
http://www0.sun.ac.za/safmachform/machform/view.php?id=73618

Welcome

In this newsletter – recent publications, upcoming conferences and training, and our brand new youtube channel! If you need microCT for your research or to improve your production, contact us today.

Mummy analysis from medical CT scans

Recently Prof Salima Ikram, distinguished Egyptologist from University of Cairo visited us for visualization and analysis of medical CT scan data of animal mummies. She studies animal mummies of many kinds, including birds, dogs, cats, even crocodiles. Here she is seen in our analysis facility with new NRF intern Ms Muofhe Tshibalanganda. For more information about her work, see her website here: **http://www.salimaikram.com/**



3D data visualization and analysis: NRF intern Ms Muofhe Tshibalanganda and Prof Salima Ikram, head of dept Egyptogology at University of Cairo.

Online bookings

Please book your session online for microCT, nanoCT or analysis PCs. We book in 4 hr slots for simplicity, please contact us if this is a problem. The booking system is found here:
http://www.supersaas.com/schedule/CAF_Booking_systems/CT_Facility

Youtube channel

We have started a youtube channel of short videos, which are meant to help you to understand your data, and get started with 3D data analysis. See the first video here:

https://youtu.be/A0KZFeCOJHY

Contact Us

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

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

Highlights

We have a new review paper highlighting how to best make use of microCT for biological samples. Many of the criteria for good quality scans are also applicable to other fields of application, so it makes a good reference for new users. The paper which is published in Gigascience includes micro and nanoCT data sets, freely downloadable for new users to familiarize themselves with microCT data. Also included are 3D print files of the chameleon used as example. Read the article here:
https://academic.oup.com/gigascience/article/3737665/Laboratory-X-ray-micro-computed-tomography-a-user?searchresult=1

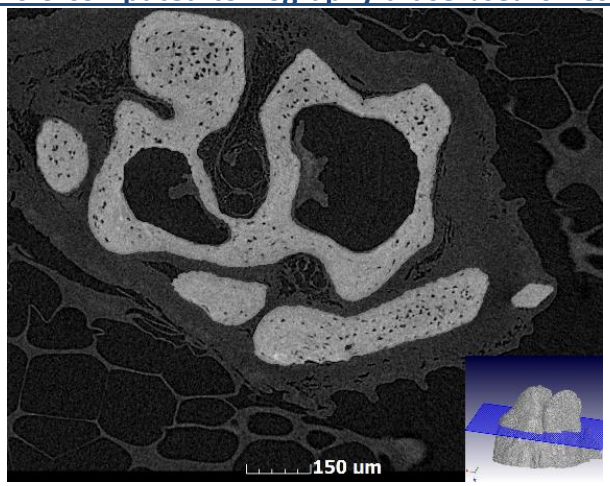

Figure 1: NanoCT image of the tip of the bony structure inside the horn of a chameleon.

Guess-the-X-ray

The solution to the last “guess the X-ray” image: a sea urchin. This month’s guess the x-ray is an easy one:

Do you think this X-ray was planned? Where do you think the sample is now?

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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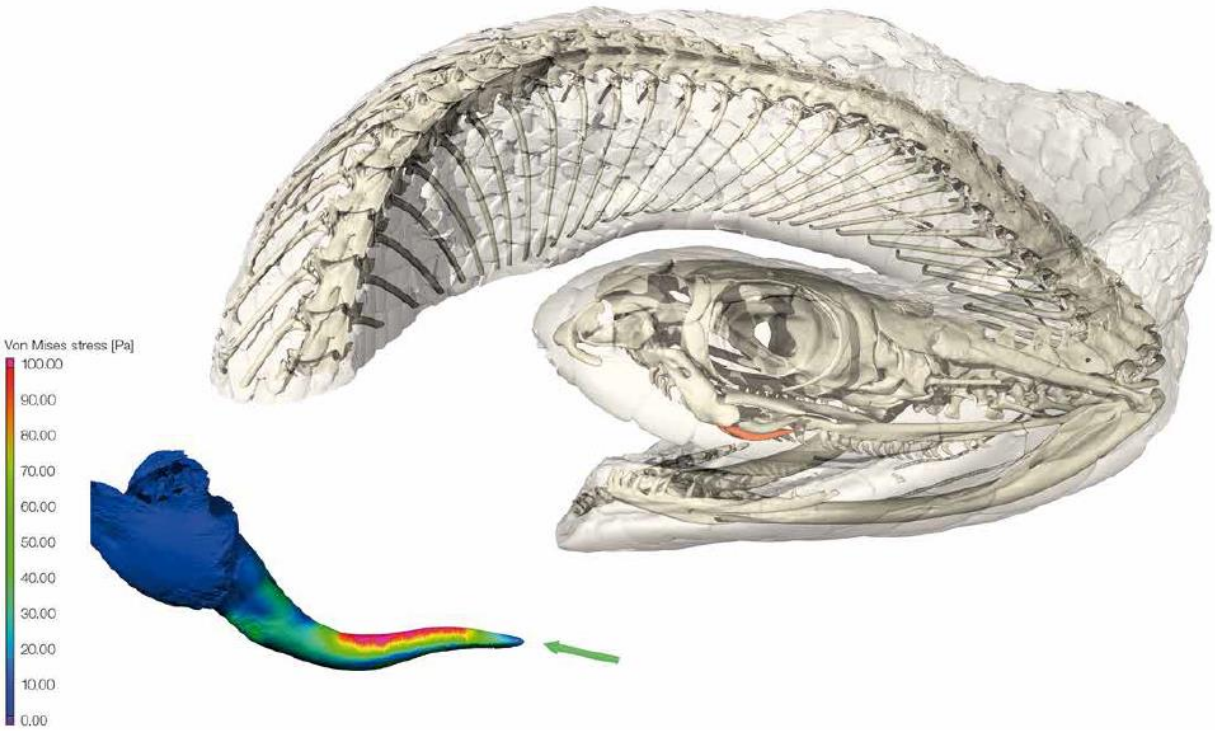
VOLUME GRAPHICS
Enabling better products



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)

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