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Recent interesting scans (clickable links)

Nondestructive fruit experiments

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Fossil brittlestars publication

<http://www.sciencedirect.com/science/article/pii/S1464343X15000837>

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3D printed lizard skin from nanoCT data set

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<http://blogs.sun.ac.za/idea2product>

MicroCT scan of Ghent nose

A Ghent nose is a sweet originating from the university town of Ghent in Belgium. Since we visited Ghent last month for the DIR2015 conference, we decided to scan and analyze a Ghent nose as an example for this newsletter.

This example shows how 3D X-ray imaging can be used to visualize internal features of food products, in this case showing clearly some large air bubbles / pores. In the images in Figure 1 is shown the actual sample, the CT data surface view, a cropped view showing the internal colour-coded air bubbles and a CAD polygon mesh of the surface (STL format output). Besides these images, two videos and additional figures including a colour-coded crust thickness analysis is found at the link below. We think this is pretty sweet!

<http://blogs.sun.ac.za/ctscanner/ghent-nose-ct-scan/>

Welcome

Welcome to our July-August newsletter. This newsletter is aimed to show through simple examples how X-ray CT scanning can be used. In this newsletter we have a sweet called a Ghent nose. We also show 2 recent publications from work at our facility: fossil starfish inside rocks, and porosity analysis of titanium castings before and after "HIP" treatment (which is meant to remove the porosity). Enjoy the examples, and remember to book your own scans as soon as possible.

The IMGRAD2015 conference preliminary program is available, so please consider registering and joining us to discuss the huge potential of laboratory X-ray tomography in South Africa, and network with other users in diverse fields. The preliminary program can be found here: http://academic.sun.ac.za/saf/downloads/IMGRAD2015%20program%20prelim_v2.pdf?id=53118

Please note there are still spots available for the pre-conference 2-day software training course

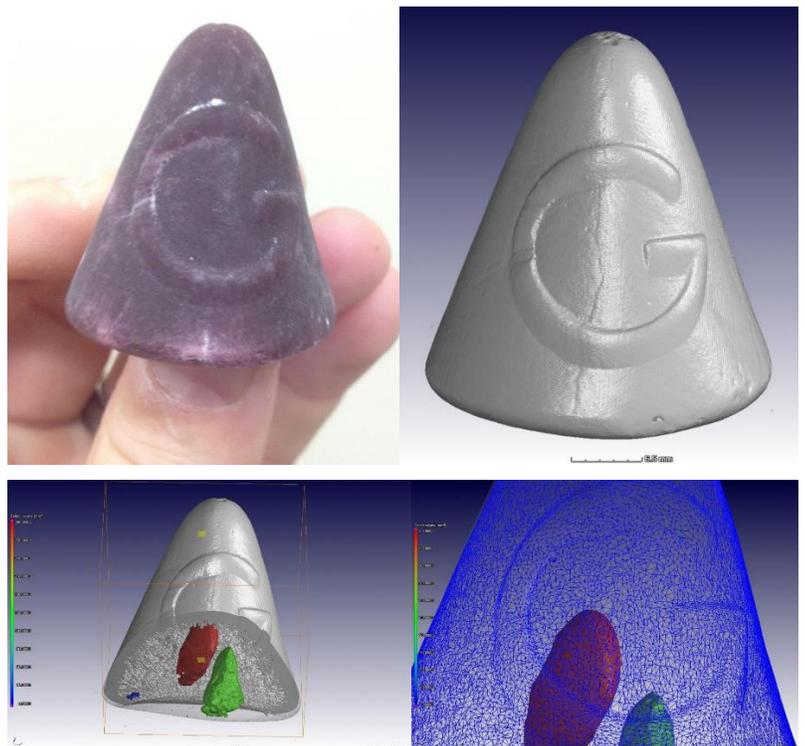


Figure 1: Ghent nose CT Scan (a sweet with sticky liquid inside with air bubbles)

X-ray scanning of fossil starfish

We are very happy to see our UCT clients publish their work. This work is best left to the experts for technical descriptions. It involves rocks with starfish fossils, to the non-geologists among us.

The article's title is "Taphonomy and sedimentology of an echinoderm obrution bed in the Lower Devonian Voorstehoek Formation (Bokkeveld Group, Cape Supergroup) of South Africa" by Mhairi Reid, Emesa M. Bordy and Wendy Taylor, Journal of African Earth Sciences, Volume 110, October 2015, Pages 135–149. It can be found online at the journal website:

<http://www.sciencedirect.com/science/article/pii/S1464343X15000837>

Titanium alloy (Ti6Al4V) casting analysis before and after HIP treatment

In this work, cast rods of titanium were investigated for porosity distribution at high resolution, treated by hot isostatic pressing (HIP) to remove the porosity, and subsequently analyzed again by high resolution microCT under identical scan conditions. Direct comparison which is made possible due to the nondestructive nature of CT shows a striking efficiency of pore removal, even those with 3 mm diameter are entirely closed up. An interesting additional result was that some isolated extremely small pores close to the surface of the samples remain unchanged in size. Read the full paper here:

<http://link.springer.com/article/10.1007/s11665-015-1580-4>

It can also be found on our RESEARCH page:

<http://blogs.sun.ac.za/ctscanner/research/>

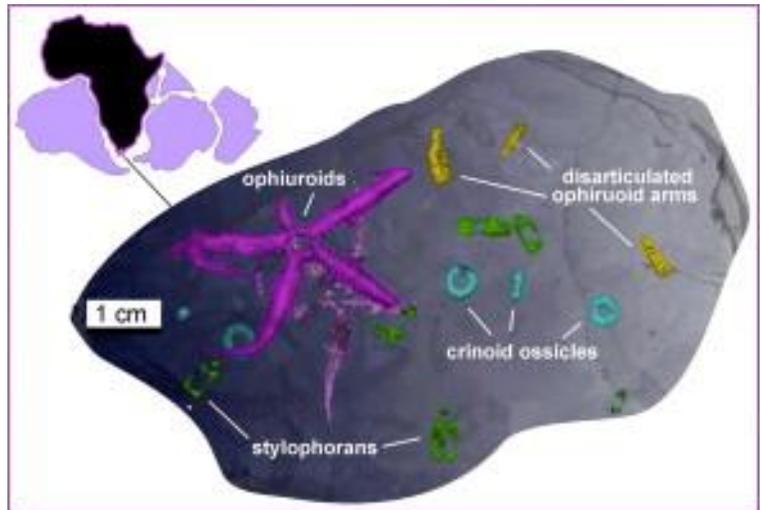


Figure 2: X-ray scanning fossil starfish. This is the graphical abstract of the article which can be found at the link to the left.

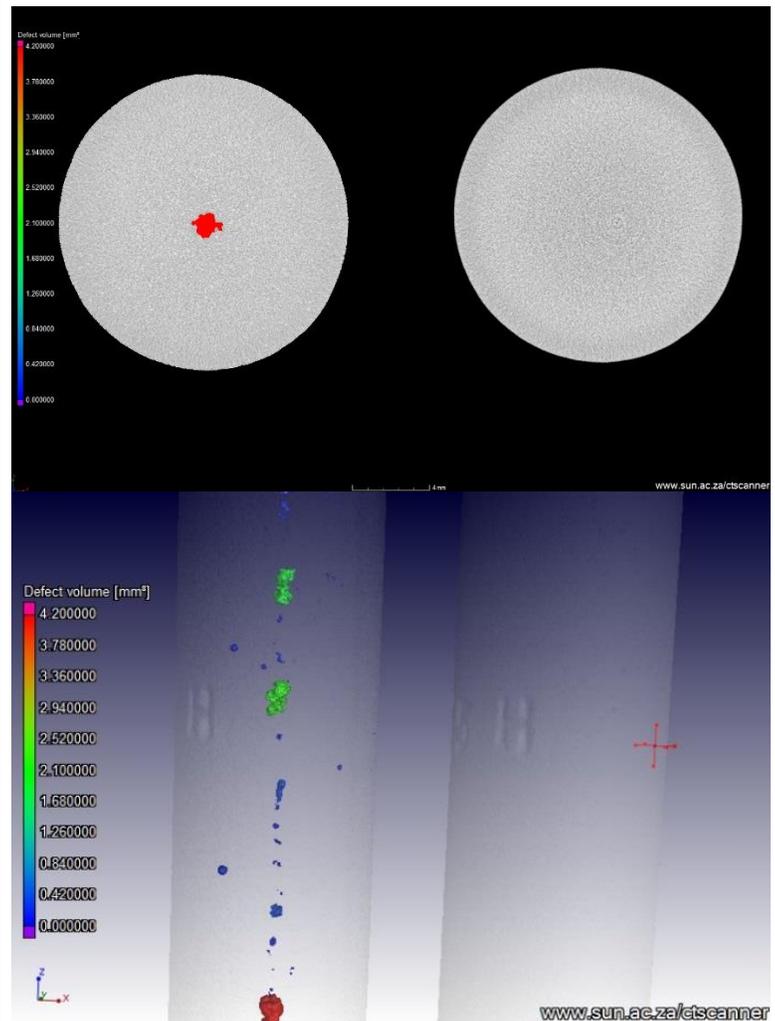


Figure 3: Porosity analysis before and after HIP treatment (same sample) – max pore diameter was 3 mm before HIP.

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IMGRAD2015 conference news

The IMGRAD2015 conference program is now available. Gold, silver and bronze sponsorships will make possible a great conference, we thank the sponsors for their contributions. As a show of thanks we add their logos to the advert space at the back of the newsletter. For the preliminary conference program, have a look here: http://academic.sun.ac.za/saf/downloads/IMGRAD2015%20program%20prelim_v2.pdf?id=53118

To join the conference, please register here:

<http://www0.sun.ac.za/safmachform/machform/view.php?id=53118>

When planning your trip to Stellenbosch, why not include a 2-day training prior to the conference, there are still some spots available, see more information here:

http://academic.sun.ac.za/saf/training_IMGRAD.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. Stellenbosch University support of CAF allows special internal rates, subject to acknowledgement of our facilities in publications.

Researchers & companies: provide us your equipment and advanced softwares to manage as part of our facility, in exchange for zero cost of usage, free maintenance and upgrades. This is a win win situation, where we use it to maintain our facility and enhance our materials analysis capabilities.

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