

'Images of the inside of a fly' elected as computed microtomography's Best Film of the Year

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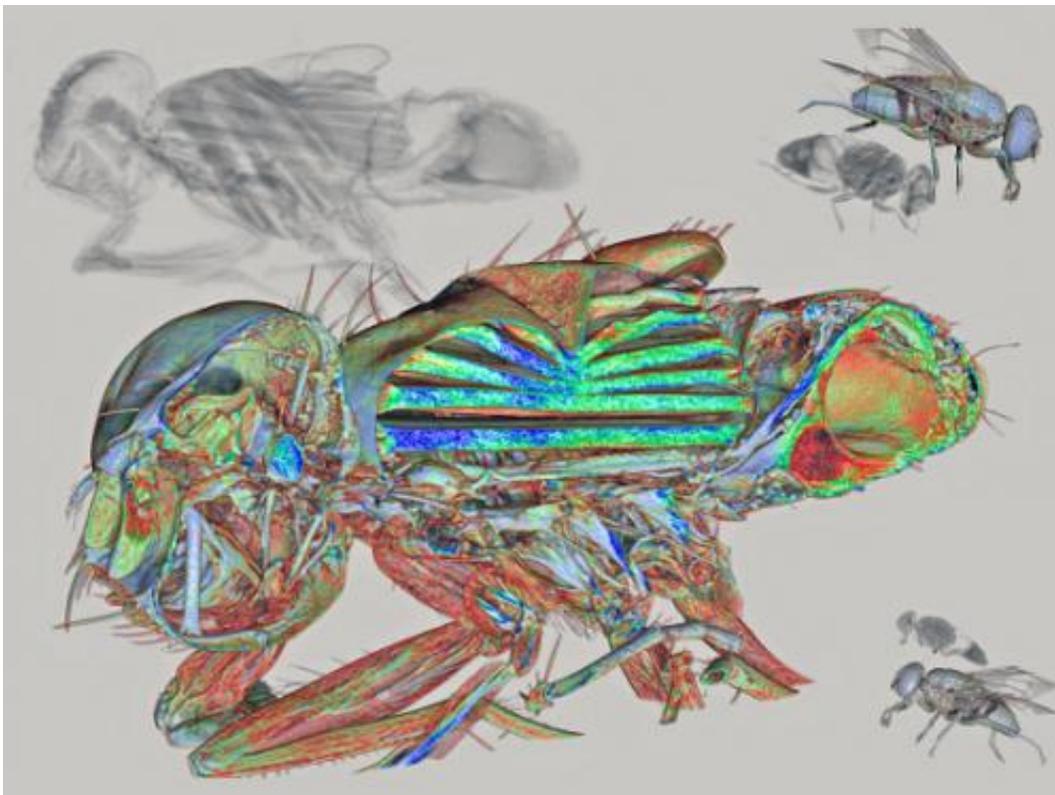


Image of the inside of a domestic fly, prize-winner at the "MicroCT Meeting 2013" international microtomography conference, held in Hasselt, Belgium.
Credit: University of Granada

Images of the inside of a domestic fly taken at the University of Granada

using a microtomograph—an instrument that produces high resolution images by scanning tiny animals—has won the prize for Best Film of 2013 at "MicroCT Meeting 2013", an international conference in microtomography recently held in Hasselt, Belgium.

The micro-CT reconstruction by Professor Javier Alba-Tercedor of the Department of Zoology, shows images of the inside of the body of a common fly with a previously unattainable level of detail. He has achieved this by using a Skyscan 1172 micro-CT, available in the Department of Zoology of the University of Granada Faculty of Science, that achieves 1.4 μm per pixel resolution, making high resolution scans of tiny animals possible.

[Tomography](#) is a non-[invasive technique](#) that is well-known in the scientific community because of its widespread use in medicine. Micro-CT enables us to obtain high levels of resolution and, because it does not affect the samples in any way, makes it easy to study valuable specimens without harming them.

Several thousand X-rays

As Prof Alba-Tercedor explains, "you need to take several thousand X-ray images to obtain photos like these. To do this, the animal being studied is placed on a rotating platform, taking x-rays with a cadence that varies according to the quality needed". In most cases, x-rays are taken every 0.1 degrees. That means that if the platform rotates 180 degrees, a total of 1800 images are taken. And these, after they've been processed with special software, give us results that were previously unimaginable. Similarly, because of these slices we need to scan the animal in several parts and later join them together using the appropriate software.

University of Granada Prof. Alba-Tercedor is currently working on a

new line of research: the application of microtomography in zoological studies. His work—in collaboration with Dr Isabel Sánchez-Almazo of the University of Granada Scientific Instrumentation Centre (CIC)—has, for example, enabled them to study insect eggs that are sometimes less than one tenth of a millimetre long. To do this, they have used an new addition, recently acquired by the University of Granada, that enables them to convert a sweep electron microscope into a [high resolution](#) microtomograph (less than 500 μm per pixel).

"Precision like this means we can study not just the external structure but also see and study the embryo and its development, without having to make real histological cuts", says Prof Alba-Tercedor. Moreover, the images and 3D models (volume renderings) created from micro-CT generated [images](#), help us develop "a new way of teaching, in which students themselves can perform virtual dissections of animals without the need to sacrifice them, as we had to do until now".

The University of Granada is currently collaborating with other research centres both in Spain (University of Alicante, Complutense University of Madrid and the Natural Science Museum, Madrid), and abroad (Natural History Museum of Stuttgart, Germany and the Albany Museum in Grahamstown, South Africa). In Prof Alba-Tercedor's own words, "microtomography opens the door to as many opportunities as researchers can imagine".

It is not the first time this University of Granada professor has been awarded a prize for a study like this. In 2010 he won the same prize for a photograph of a transversal section of the internal anatomy of an aquatic coleoptera, and in 2012 he won the prize for the best video for a film that showed a journey through the the beetle's insides. Most of the videos generated in Prof Alba-Tercedor's micro-CT studies can be seen on his YouTube channel: <http://www.youtube.com/albatercedor>

Provided by University of Granada

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