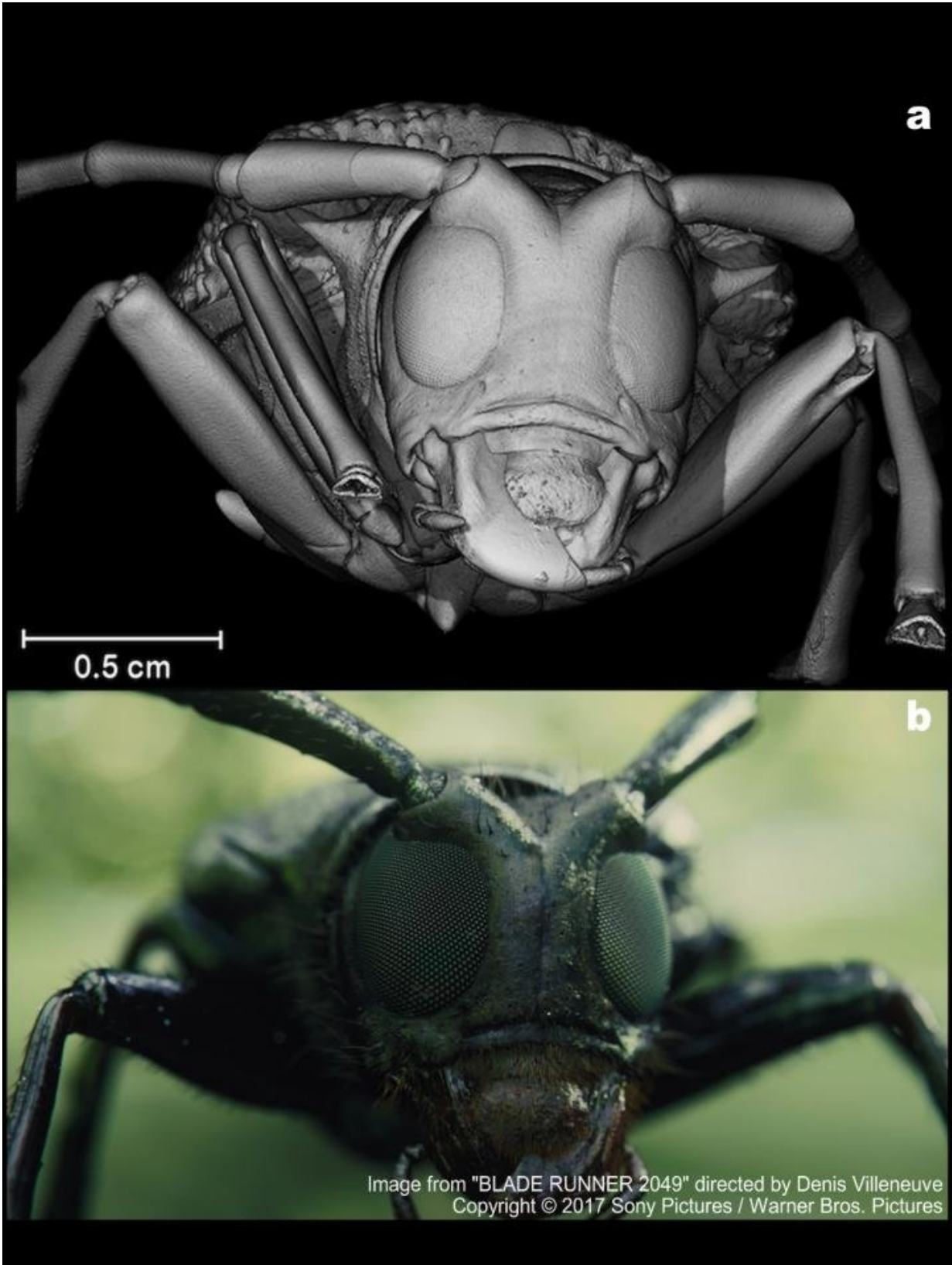


Scientist developed 3-D scans of beetles for Blade Runner 2049

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Volumetric reconstruction through micro-CT scans and the final results of the visual effects developed by BUF. Credit: Javier Alba-Tercedor & BUF

BUF, one of the main visual effects companies behind *Blade Runner 2049*, sought the collaboration of Javier Alba-Tercedor, a Professor of Zoology at the University of Granada, to obtain scans of different species of beetles used in the film's visual effects. *Blade Runner 2049*, directed by Denis Villeneuve, has earned five Oscar nominations as part of the 90th Academy Awards (2018), one of which is for Best Visual Effects.

Prof. Alba-Tercedor is an expert in computed microtomography, a technique for imaging tiny objects with high detail in 3-D. He provided BUF with high-resolution microtomography images that served as the basis for a sequence involving visual effects and 3-D animations of beetles.

Most of the specimens scanned for the film were tropical species from the longhorn beetle (Cerambycidae) family, specimens of which were sent from the offices of the BUF company in Paris to the laboratory of the Department of Zoology at the UGR. A species of darkling beetle (Tenebrionidae), known as *Zophobas morio*, was also provided by Javier Pérez López, a researcher from the Parque de las Ciencias in Granada.

Prof. Alba-Tercedor says, "At the beginning, I did not know that the scans of these insects would end up becoming part of the visual effects of *Blade Runner 2049*. I had never imagined that the skills acquired during my research career would be useful for the film industry."

The excellent quality of the results is discernible in a scene in which the character of Dr. Ana Stelline employs a handheld device that can be used

to rapidly manipulate holographic shapes. To produce this scene, the technical team at BUF used the scans provided by Prof. Alba-Tercedor, created photorealistic models of insects in which even microscopic structures such as tiny hairs and eye features were discernible.

Each scan produced sequences of approximately 3,000 images, each of which had a resolution of an ultrasound image. Using these materials, the BUF visual effects company then created lifelike 3-D animations of the beetles. According to BUF, "The incredible results that can be seen in *Blade Runner 2049* show that microtomography represents a very valuable and accurate tool for reconstructing and producing computer-generated animations of tiny animals with microscopic structural details, such as the insect species used in this film. This project relied on synergies between microtomography and the [visual effects](#) industry, and ultimately, between the academic-scientific sphere and the entertainment industry."

In recent years, Prof. Alba-Tercedor has been developing studies using computed microtomography to unravel mysteries that were previously unexplained, involving small animals and other materials and specimens. His outstanding work has earned him several international awards and mentions. His contributions to *Blade Runner 2049* were included in a publication at the 2018 Bruker Micro-CT User Meeting.

Provided by University of Granada

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