

## Customer Spotlight

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# FAMU uses Avizo®

to visualize and understand heat transfer and fluid flow



**By the CHEFF Research Group at Florida Agricultural & Mechanical University:**

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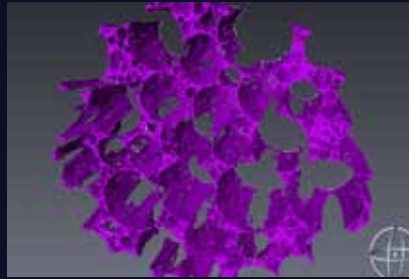
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# Visualization of heat transfer and fluid flow

By the CHEFF Research Group at Florida Agricultural & Mechanical University



Left: Porous graphitic carbon foam volume rendering in Avizo

Right: The porous graphitic carbon foam reconstructed from 3D images

The **CHEFF** (Computational **HEat** Fluid **Flow**) Research group at Florida Agricultural & Mechanical University is using computational fluid dynamics to model flow and heat transfer in various engineering applications for industry, government and the private sector. The primary goal of this research is to first examine and then enhance the thermal performance of current and future low- density reticulated porous media, and explore their use as heat sinks in high power electronics (computer chips), heat exchangers (radiators) and heat shielding from aircraft exhaust.

Convective heat transfer in reticulated porous media involves the formulation of complex flows and temperature fields preventing the user from extracting exact or comprehensive analytical solutions. Avizo<sup>®</sup> by VSG is currently allowing CHEFF to generate 3D representations of reticulated porous foams from MRI (Magnetic Resonance Imaging) and CT-scans. Surface reconstruction of an object from 3D images, when used in CFD studies, can accurately capture the velocity and temperature fields, and quantify the fluid and heat transport within the porous media.

With the added benefit of the mesh generation functionality in Avizo, the user is able to generate a volumetric grid within the object to be imported directly into the CFD software rather than using a separate external gridding program. Another major benefit of Avizo is the simplicity of the 3D image reconstruction. Using the tutorials which are included with the software, the primary Avizo capabilities can be learned in a couple of hours and proficiency with the more complex functions can be gained within a matter of a few days. Avizo's support for 64-bit platforms is a must to utilize the full capacity of memory for high-speed computations without the need to write any additional or user-defined programs. With Avizo's variety of exportable file formats, exporting into CFD and alternate design software programs is simple.

Avizo's versatility provides multiple ways of reconstructing a surface based on to the quality of the images. Even with poor quality images, useful 3D representations can be created for visualization purposes.

Images: Florida Agricultural & Mechanical University

## About Avizo<sup>®</sup>

Avizo<sup>®</sup> software is a powerful, multifaceted tool for visualizing, manipulating, and understanding scientific and industrial data. Wherever three-dimensional datasets need to be processed, in material sciences, geosciences, environmental science or engineering applications, Avizo offers abundant state-of-the-art features within an intuitive workflow and easy-to-use graphical user interface.

## About FAMU

Florida Agricultural and Mechanical University, commonly known as Florida A&M or FAMU, is a university located in Tallahassee, Florida, USA.



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