

3-D microscope opens eyes to prehistoric oceans and present-day resources

September 20 2011

A University of Alberta research team has turned their newly developed 3-D microscope technology on ancient sea creatures and hopes to expand its use.

U of A engineering professor Dileepan Joseph and two graduate students produced a 3-D imaging system called Virtual Reflected-Light Microscopy. The technology consists of a regular [optical microscope](#), a light source, a platform that moves the objects being photographed and software programs that extract shape and reflectance from images and transform this digital information into a 3-D image. To see the full effect on a computer screen viewers wear simple, paper framed 3-D glasses with red and cyan coloured lenses. Viewers also control a virtual light source, which they reposition using their web browser.

The test subjects used in the development of the VRLM were drilling [core samples](#) taken from beneath the floor of the Pacific Ocean. Joseph, Ph.D candidate Adam Harrison and master's student Cindy Wong produced 3-D images of ancient protozoa or [microfossils](#) that were mixed in with the sand and rock in the core samples.

Joseph says the VRLM gives geoscientists and computer programs in development much more information than simple images. The goal is to accelerate species identification of the tiny and numerous microfossils. Such identifications are used to date the rock from which the creatures are pulled. The microfossil species digitized by the U of A's VLRM prototype were found in rock known by geologists to be 60 million years

old.

Geoscientists can use that kind of strata dating information in Earth sciences research and in the search for energy resources. The U of A researchers say there are multiple industrial and academic uses for their 3-D microscope technology.

More information: The development of the VLRM technology is documented by the U of A researchers in the academic publication *Journal of Microscopy*.

Provided by University of Alberta

Citation: 3-D microscope opens eyes to prehistoric oceans and present-day resources (2011, September 20) retrieved 5 July 2024 from <https://phys.org/news/2011-09-d-microscope-eyes-prehistoric-oceans.html>

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