PRESS RELEASE

DISCOVERY OF FOSSIL MICROBES IN A NEW CARBONACEOUS METEORITE

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Richard B. Hoover, Visiting Research Professor at the Buckingham Centre for Astrobiology (BCAB), announced the discovery of new evidence for fossilized filamentous bacteria at an International Astrobiology Conference held as part of the 2012 SPIE Optics & Photonics Symposium. The finding was based on a Scanning Electron Microscope study of the Sutter's Mill meteorite that landed in California on April 22, 2012. Hoover revealed images of fossils similar to cyanobacteria that he found in freshly fractured interior surfaces of a fragment of this pristine meteorite. He presented data obtained by Energy Dispersive X-Ray Analysis that established that many of the filaments had been converted into a carbon-rich, oxygen-poor, insoluble organic material known as kerogen. Coal is a form of terrestrial kerogen that forms only after burial for many millions of years. The meteorite fragment studied was carefuly collected on April 27 - only five days after the Sutte's Mill meteorite landed. For this reason, he concluded that these ancient remains of bacterial filaments could not possibly have been modern contaminants that invaded the stones after they landed on Earth. At this meeting, Hoover also presented new images of magnetite framboids and fossils of extinct acritarchs and cyanobacteria in the Orgueil CI1 meteorite (that fell in Southern, France, May 14, 1864) and the Tagish Lake meteorite that fell in Canada in (January 18, 2001). Hoover published other evidence for microfossils in these meteorites in the *Journal of Cosmology* in 2011. Independent scientists from the Paleontological Institite (RAS) have also found similar microfossils in the Orgueil and Murchison meteorites. Other scientists have previously reported the detection in these meteorites of extraterrestrial biomolecules that are essential for every living cell on Earth. These include 8 of the 20 amino acids required for proteins and 3 of the 5 nucleobases essential to DNA and RNA. However, missing from the meteorites are 12 protein amino acids and 2 life-critical nucleobases (Cytosine and Thyminine) that are stable over millenia, but dissappear over geological time periods (millions of years). Hoover has pointed out that Michael Engel of the University of Oklahoma has shown that these life-critical biomolecules would have to be present in the meteorites at detectable levels if the meteorites had been contaminated by living bacteria that invaded the stones after they landed on Earth (Orgueil, 1864; Murchison, 1969;Tagish Lake, 2001 and Sutter's Mill, 2012). Consequently the preserved biological remains of recognizable cyanobacteria that Hoover has imaged and analyzed represent clear and convincing proof of the existence of extraterrestrial life. Because meteorites are the relics of comets after thousands of perihelion passages, the inference is that comets harbour living microorganisms, as proposed by the late Sir Fred Hoyle and Chandra Wickramasinghe some 50 years ago. The theory of cometary panspermia would appear t0o have been vindicated.

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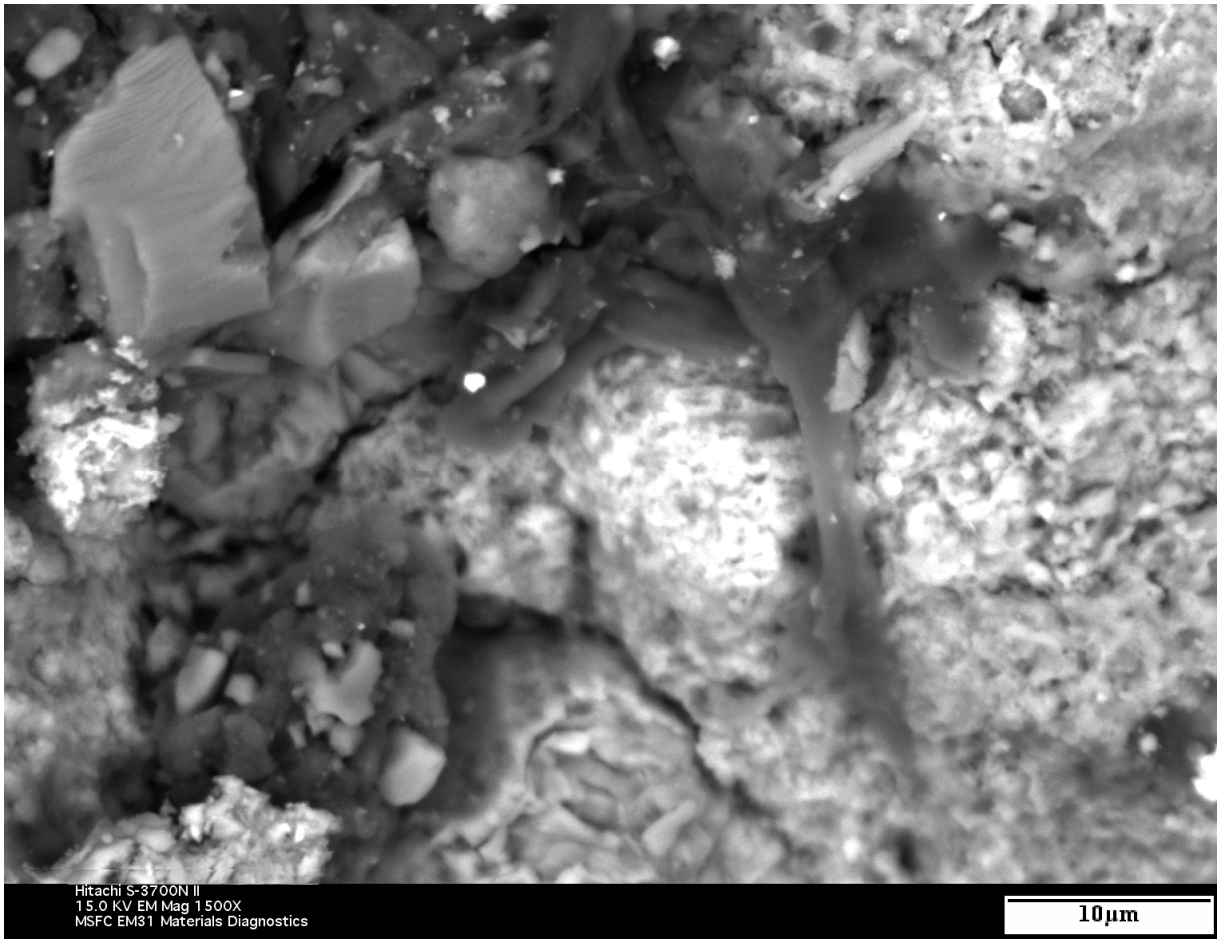
Field Emission Scanning Electron Microscope image (10,000 X) of cyanobacterial filaments similar to *Microcoleus* sp. in Sutter's Mill meteorite. (Richard B. Hoover)



1500X Field Emission Scanning Electron Microscope image of carbon-rich (kerogenous) cyanobacterial filaments and fossil bacteria in Sutter's Mill meteorite. (Richard B. Hoover)

Richard B. Hoover established the Astrobiology Research Group at the NASA/Marshall Space Flight Center in 1998. He is currently a Visiting Research Professor with the Centre for Astrobiology at the University of Buckingham in the United Kingdom. Hoover joined the NASA/Marshall Space Flight Center in 1966 and developed the Telescope that produced x-ray images of the Sun from America's first Space Station, *SKYLAB.* He was selected NASA Inventor of the Year in 1992. His Astrobiology research at NASA/MSFC has centered on microorganisms that live in extreme environments and evidence for microfossils in ancient rocks meteorites. He was Science Team Lead for the *Antarctica 2000 Expedition* with Apollo Astronaut James A. Lovell *(Gemini 7 & 12; Apollo 8 & 13)* and Skykab Astronaut Owen K. Garriott *(Skylab III, Spacelab 1*). This expedition recovered 20 meteorites currently in the *Field Museum* in Chicago. He described two new genera and nine new species of bacteria from samples collected on these expeditions. Hoover was elected Fellow National of the *Explorers Club* and honorary Life Member of the *Planetary Studies Foundation.* He has Authored/Edited 40 books and over 300 scientific papers on X-Ray/EUV optics, Diatoms, microbial extremophiles, meteorites, and Astrobiology. His research was featured in films by the *National Science Foundation, BBC; The Discovery Channel, The History Channel, National Geographic, National Science Foundation,* and *NHK Japan Television.* Richard B. Hoover was 2001 President of *SPIE, the International Society for Optical Engineering* and in 2009 was awarded the SPIE Gold Medal of the Society.