Like a rock: New mineral named for UW astronomer

June 13 2008

The International Mineralogical Association has named a new mineral, the first to be discovered in a particle from a comet, in honor of Donald Brownlee, a University of Washington astronomer who revolutionized research on interplanetary dust entering Earth's atmosphere.

The manganese silicide mineral, a combination of manganese and silicon, is now officially called brownleeite and joins a list of more than 4,300 accepted minerals. It was found inside a particle collected from a dust stream entering the atmosphere in 2003.

Brownlee, whose UW office is adorned with a variety of mineral specimens, was clearly pleased with the honor – and somewhat amused.

"I've always been very intrigued by minerals, so it's great to be one," he said. "I never dreamed I'd have a mineral named after me. I guess maybe being a vitamin is next."

The particle was captured by a high-altitude NASA aircraft, and NASA researchers in Houston, along with collaborators elsewhere in the United States, Germany and Japan, identified the compound. (See www.physorg.com/news132505751.html). Brownleeite, a semiconductor material, can be synthesized but has not been found naturally on Earth.

The team that found the manganese silicide was led by NASA scientist Keiko Nakamura-Messenger from the Johnson Space Center in Houston, who provided documentation for the international mineralogical body to

declare the specimen to be a new mineral. The team also asked that it be named for Brownlee.

"This really did surprise me because I know it took a lot of effort to get this mineral approved," Brownlee said.

Nakamura-Messenger's team believes the dust particle originated in a comet, possibly comet 26P/Grigg-Skjellerup, which was predicted to be the source of an Earth-crossing dust stream in April 2003, when the particle was captured.

The Earth is covered with more than 30,000 tons of particles from space every year, one particle per square meter of planet surface every day. But the particles are so small that it would take 10 billion to fully cover that square meter of surface, so they are extremely hard to find.

"That's a lot of dirt and it takes 300 million years to build up a layer as thick as the diameter of a human hair," Brownlee said.

He began his efforts to capture particles of provable extraterrestrial origin while he was a UW doctoral student in the late 1960s. Others had made similar efforts previously, but they proved to be unsuccessful. Using a succession of high-altitude balloons, Brownlee captured a few particles that could be proven to have come from somewhere other than Earth.

His third balloon carried an 800-pound machine he calls "the vacuum monster," which dangled below the balloon as it drifted at an altitude of 125,000 feet, or about 24 miles. The machine made it possible to sample a very large volume of air, and eventually he was able to capture a total of about a dozen interplanetary dust particles from seven flights.

He later devised a small collector that could be attached to the fuselage

of high-flying U2 reconnaissance aircraft and, because the planes remain airborne for so long and fly at high speeds, they are able to collect hundreds of particles.

"Almost all of the flights are done for something else, and these detectors are along for the ride. When they are opened, they just flop out into the atmosphere and gather particles as the plane moves along," Brownlee said.

Brownlee also is a leading authority on comets. He is the principal investigator of NASA's Stardust mission, which traveled to comet 81P/Wild-2 beyond the orbit of Mars, captured particles streaming from the comet's surface, and returned them to Earth in January 2006. The samples are curated by the Johnson Space Center.

Source: University of Washington