Early solar system garnet-like mineral named for Livermore cosmochemist

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A recently discovered mineral appears to be clear but may have a tinge of light blue. No matter its color, you won't be able to make earrings from it.

For one, you can't see the material with the naked eye. Hutcheonite, recently named after Lawrence Livermore meteorite researcher Ian Hutcheon, can be seen only with high powered scanning electron microscopes.

Known also by its chemical makeup, $Ca_3Ti_2SiAl_2O_{12}$, hutcheonite was discovered in a refractory inclusion in the Allende meteorite by Sasha Krot (University of Hawaii) and Chi Ma (Caltech) and named in honor of Hutcheon, who has made numerous contributions to the study of meteorites and what they can tell us about the evolution of the early solar system.

The hutcheonite mineral structure and name have been officially approved by the International Mineralogical Association. The discovery was formally announced at the annual meeting of the Meteoritical Society just held in Edmonton, Canada.

Refractory inclusions within meteorites are the oldest objects in the solar system. Hutcheon has been studying these, specifically in the meteorite Allende, since his days as a postdoc at the University of Chicago in 1975.

Allende is the largest carbonaceous chondrite meteorite ever found on Earth. It fell to the ground in 1969 over the Mexican state of Chihuahua and is notable for possessing abundant inclusions.

"I'm not in the business of discovering minerals," Hutcheon said. "But I am interested in dating when these minerals formed and what happened to them several million years after they formed."

Hutcheon also is interested in finding out when water formed on the asteroid on which Allende and other carbonaceous chondrite meteorites were put together. By looking at the concentrations of elements and isotopes in minerals found in the Allende inclusions, Hutcheon and his team can trace how water got there and ultimately how water developed in the early solar system.

In his nearly 20 years at the Lab, Hutcheon has been a key developer of nuclear forensics as both a field of scientific investigation and a scientific discipline with significant applications to national security. He also has conducted groundbreaking work in the formation mechanisms of planets and meteorites, and subtle, diffusion transport processes in terrestrial and planetary melts, glasses, and minerals; and conducted the first NanoSIMS-enabled studies of biological materials (NanoSIMS is a high resolution imaging mass spectrometer used to probe extremely small materials). Hutcheon, with colleagues, also wrote the definitive nuclear forensics book, "Nuclear Forensic Analysis." He has been named a Distinguished Member of Technical Staff at the Laboratory, an honor that is only given to roughly 3 percent to 5 percent of the eligible pool of scientists and engineers.

Hutcheon enrolled in graduate school two months after Neil Armstrong walked on the moon and was intrigued by studying radiation damage in the moon samples brought to Earth. However, by the time he became a postdoc, he realized the moon was relatively young in terms of other

objects in the solar system. Meteorites were where it was at.

If it were up to Hutcheon, he would stick strictly to meteorite research. "I would do it full time. It's great fun. Meteorites are tens of millions of years older than the moon."

Hutcheon isn't the only Laboratory researcher to have a mineral named after him. Geochemist Tim Rose has two minerals named after him: timroseite and paratimroseite.

Hutcheonite is less than one-tenth the width of a human hair and on looks alone may appear to be similar to 11 of the other newly discovered minerals found in Allende. But if you look hard enough, you may just find hutcheonite lurking in a corner of Allende where you never expected to look.

Provided by Lawrence Livermore National Laboratory