

Collection of Micrometeorite Particles at The University of New Haven
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Abstract:

As comets travel through space they leave a trail of dust behind them. This dust is made up of tiny particles that we refer to as meteorites, all of which have broken off the initial comet. Often Earth will pass through these debris trails while rotating in its orbit and the debris will be in the upper atmosphere. As these particles, of which are mostly composed of metal, rapidly fall through our atmosphere they initially heat up and melt, to then eventually be re-solidified in the lower atmosphere as perfect spheres with a diameter ranging from 50 μm to 2mm. Water droplets will condense onto these newly reformed particles and they will fall to Earth's surface in rain droplets.

In order to collect a maximized amount of rainwater, therefore theoretically a maximized amount of micrometeorites, rainwater was collected from the bottom of downspouts. A collection apparatus was designed to force any water coming out of the down spout by a 2" Neodymium disc magnet (pull force of 49 pounds) at a reasonably slow flow rate. The magnetic material found attached to the magnets after weeks of collection was then analyzed under a stereo microscope to identify potential micrometeorite particles.

The majority of material collected was miscellaneous magnetic particles; none of the desired micrometeorite particles were seen. The lack of micrometeorites is likely due to a short collection period and small collection area as it is suggested micrometeorites fall to Earth at a rate of 1 meteorite/ m^2/year .

References:

Genge, M.j., et al. "An Urban Collection of Modern-Day Large Micrometeorites: Evidence for Variations in the Extraterrestrial Dust Flux through the Quaternary." *Geology*, vol. 45, no. 2, May 2016, pp. 119-122., doi:10.1130/g38352.1.

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Bio:

Danielle is a junior at the University of New Haven studying Chemical Engineering. She is involved on campus working as a Teacher's Assistant for the Tagliatela College of Engineering as well as a math, science, and engineering tutor at the Center for Learning Resources. She hopes to take her knowledge gained from the University of New Haven to pursue a chemical engineering career in the future.

