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UNH Scientist Leads Rocket Launch to Study Dust from Shooting Stars in the Earth's Upper Altitudes

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Editors Note: UNH Professor Kristina Lynch is expected to return to campus early next week and will be available for interviews.

CHATANIKA, ALASKA -- With more than 40 metric tons of material from meteors, also called "shooting stars," entering the Earth's environment every day, University of New Hampshire Research Associate Professor Kristina Lynch is a busy person.

In fact, right now she is at what may seem like the end of the Earth in Chatanika, Alaska, waiting for clear skies and the right upper altitude conditions to launch four rockets into space to study the structure of the dust layers that form when this material burns up.

The launch already has been delayed for several days because of high winds, in addition to a temporary moratorium on launches because of an annual local festival.

The launch window first opened March 5. The research crew, consisting of scientists from UNH's Institute for the Study of Earth, Oceans, and Space; Utah State University; Cornell University and the University of Alaska, launched one rocket on March 7 and are eagerly awaiting the opportunity to launch the other three rockets from the Poker Flat Research Range. The crew also includes UNH graduate student Elizabeth MacDonald.

Material from meteors burns up and re-condenses into

dust particles that become suspended in the mesosphere, which is considered Earth's "near" environment at an 80 to 100 kilometer altitude. An increase in dust in the atmosphere, which can darken the skies, can be a concern; increase in dust from a meteor impact is thought to have been a possible cause for the demise of the dinosaurs.

Because the physics and chemistry of the mesosphere is poorly understood, measurements of these particles are important for developing quantitative models of global change in the Earth's upper altitudes.

"The dust particulates to be measured by these rockets may provide important materials and/or catalysts to mesospheric chemical processes as yet not understood," Lynch says.

The rockets, called "Dust-Orions," carry dust detectors to an altitude of about 90 kilometers. Because the Dust-Orion rockets are sounding rockets -- probes that return to Earth shortly after their launch -- data is gathered immediately. The data provided will advance earlier findings of a previous Cornell/UNH sounding rocket experiment.

The rocket launches involve three lidar probes that measure mesospheric activity in order to decide when to launch the rockets.

According to Lynch, "This huge laser, which is like a radar with a light, shows up as a vertical green light coming out of the roof of the building and going up into the sky, like a carnival light, only narrower and sharper."

Lynch is the principal investigator for this project. Lynette Gelinas, a former UNH student who is now a professor at Cornell University, is a co-investigator, along with Michael Kelley of Cornell University, Richard Collins from University of Alaska-Fairbanks, and James Ulwick of Utah State University.

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