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Artificial cloud created at the edge of space

17:54 21 September 2009 by **Rachel Courtland**

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Update on 23 September: The dust released in the CARE experiment scattered sunlight, creating a bright cloud that could be seen at visible wavelengths for several minutes before it dispersed. The cloud's effects on the ionosphere lingered longer, however, and were detected by radar for about four hours after the dust's release. Researchers are still analysing the data and expect to know more about the results in the coming weeks. **Watch a video of the cloud**

See a gallery of noctilucent clouds

The study of Earth's mysterious noctilucent clouds got a boost on Saturday, when a rocket was launched to create an artificial cloud at the edge of space.

"Noctilucent", or night-shining, clouds float dozens of kilometres higher than other clouds, at an altitude of about 80 kilometres. Because of their height, they can be seen glowing before sunrise or after sunset as the sun illuminates them from below the horizon.

The clouds were first observed above polar regions in 1885 – suggesting they may have been caused by the eruption of Krakatoa two years before. But in recent years they have spread to latitudes as low as 40°, while also growing in number and getting brighter – a change that some attribute to global warming.

The ice-covered particles in these clouds are commonly thought to get their start as tiny dust particles that had been sloughed off comets and meteoroids.
See a gallery of noctilucent clouds

The dust released in the CARE sunlight, creating a bright cloud visible wavelengths for several effects on the ionosphere linger and were detected by radar for after the dust's release. This im seven minutes after the rocket l Adhikarimayum Gopal/NRL)

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These particles build up a charge as they are bombarded by fast-moving electrons and ions. Since charged particles reflect radio waves, they are good candidates for radar studies, which could help measure the dust at an early stage in the clouds' formation. But the radar data is hard to interpret.

To get a better sense of how high-flying dust reflects radio waves, researchers launched the Charged Aerosol Release Experiment (CARE) at 2346 GMT on Saturday from NASA's Wallops Flight Facility in Virginia. The experiment, which blasted off on a Black Brant XII suborbital sounding rocket, spewed more than 100 kilograms of aluminium oxide into the atmosphere at an altitude of about 280 km.

Radar scatter

A combination of ground- and space-based instruments will watch this cloud for days and perhaps months as its particles become charged, sink, and disperse. Laser pulses will be used to measure the density of the particles in the cloud. These will be compared with radar measurements of the plume.

"Our primary science goal is to understand [how] radar [scatters] from a dusty plasma," says CARE's principal investigator, Paul Bernhardt of the Naval Research Laboratory in Washington, DC. "We want to understand what kind of information you get back when you send out radar pulses."

Radar has been used to examine icy dust that hovers some 90 km above the Earth and can grow to become the ice particles inside noctilucent clouds, says Scott Bailey of Virginia Tech in Blacksburg. He is a lead scientist for NASA's Aeronomy of Ice in the Mesosphere spacecraft, which launched in 2007 to study noctilucent clouds.

Controlled experiment

But at the moment, interpreting radar measurements of these proto-cloud particles is difficult. Although they reflect radar brightly, it is difficult to say how large the particles are or how many there might be, Bailey says.

Studying an artificial cloud created in a controlled manner could help resolve these uncertainties. "If the radar could be used to say exactly what the population of particles is up there that the ice is forming around, that would be a major step forward," Bailey told *New Scientist*.

The CARE experiment could also pave the way for future launches that would use the uppermost part of Earth's atmosphere as a large physics laboratory for studying charged dust, Bernhardt says. Dusty plasmas, like those that will be created in the CARE experiment, are seen in a range of environments, from Saturn's rings and comet tails to the dust hovering above the lunar surface.

See a gallery of noctilucent clouds

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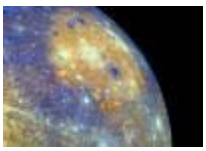

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What Eactly Is Nasa Doing To Humans??

Mon Sep 21 23:39:29 BST 2009 by **BIL**
http://www.dldewey.com/columns/clouds09.htm

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WHAT ARE THE EFFECTS TO HUMANS. PLANTS AND THE ENVIRONMENT???? READ THE EFFECTS FROM A retired, certified California United State Department of Agriculture (USDA) Farm Servic Agency Agriculture Crop Loss Adjustor!!!!!!

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What Eactly Is Nasa Doing To Humans??

Mon Sep 21 23:56:10 BST 2009 by **Sensible**

Typical American paranoia and panic-mongering. They released a mere 220 pounds of powder, which spread instantly into an air volume the size of the Gulf of Mexico. It's a bit like dropping a single grain of salt into your bathtub and screaming that it's been turned

into sea water. So why all the hysterical upper case letters and four question marks? How childish and stupid.

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What Eactly Is Nasa Doing To Humans??

Tue Sep 22 01:59:01 BST 2009 by **Kade**

Hear hear good sir!

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Tue Sep 22 03:54:15 BST 2009 by **Dann**

Surely aluminium oxide has to be among the most common types of minerals on earth? Chances are that every natural dust storm that occurs every day has more alumunium oxide in it than was released in this experiment.

Come to think of it, aren't the first-stage boosters of the space shuttles fueled by a mixture of iron oxide and powdered aluminium? They must have released a huge amount of aluminium oxide over their years of service.

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Tue Sep 22 11:46:27 BST 2009 by **Galaxiom**

The soldi fuel boosters use a mixture of

powdered aluminum and ammonium perchlorate.

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What Eactly Is Nasa Doing To Humans??

Tue Sep 22 13:42:09 BST 2009 by **Soylent**

No, thermite is used for heavy duty welding(e.g. rail-roads) and to indiscriminately set fire to stuff(e.g. the cities of Japan during WWII toghether with napalm and other incendiarys).

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What Eactly Is Nasa Doing To Humans??

Wed Sep 23 17:47:03 BST 2009 by **David Lawrence Dewey**
http://www.dldewey.com/clouds09.htm

This is David Lawrence Dewey.

Let me clarify something, I am not a nitwit as one person has posted.

Did you not read the research studies link in my column on aluminum oxide showing the toxicity of it causing cancer tumors.

http://www.hbci.com/~wenonah/hydro/al.htm

In addition, the states of Illinois and Rhode Island have listed it as a toxic substance for humans and crops.

http://www.sciencelab.com/xMSDS-Aluminum_oxide-9922858

In addition, Rosalind Peterson is a certified California United State Department of Agriculture (USDA) Farm Service Agency Agriculture Crop Loss Adjustor who has been writing about this and has seen the contamination and damage first hand what it has done to crops.

No, I do not think I am the nitwit nor is Ms. Peterson.

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Noctilucent Clouds

Thu Sep 24 00:48:24 BST 2009 by **Tony Squires**

The naturally occurring Stratospheric clouds seen in the Earth's upper atmosphere are the result, mainly, of water from the biosphere/troposphere breaking out through the tropopause, away from the local hydrological cycle and injecting into a -60C, 400kmh wind stream.

Many strong tropical storms were observed to have "domes" of water cloud above their eye, where the warm, liquid water of the storm was deforming the tropopause (at 9 miles high), partially intruding on the stratosphere, but it appears that these domes now regularly break through into anvil-shaped injections of local water into the stratosphere.

Where does this local liquid water go then ? Probably to the polar regions to fall as snow, unfortunately depriving the agricultural regions of the Earth of rainfall, exacerbating, or causing, drought conditions around the globe.

That aside, they are pretty.

Injecting "dust plasmas" into the upper atmosphere for radar imaging is a bit like ingesting Barium salts to allow Xrays to image bodily fluid flows.

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Navy - Nasa C. a. r. e. Program - Charged Aerosol Release Experiment

Fri Sep 25 05:59:12 BST 2009 by **Rosalind Peterson**
http://californiaskywatch.com/

September 24, 2009

There is a quote in the above article from the Paul Bernhardt which reads in part:

"The CARE experiment could also pave the way for future launches that would use the uppermost part of Earth's atmosphere as a large physics laboratory for studying charged dust..."

The Earth's atmosphere should not be used as an experimental physics laboratory due to the fact that we depend on it for the very fabric of life on earth. If we experiment and destroy this our atmoshere Earth as we know

it could be altered...possibly forever.

No one knows how these experiments will impact the protective atmospheric layers that surround the Earth and no one has the right to conduct such tests without public consent and oversight.

Just because the Navy and the Department of Defense, along with NASA, are funding these experiments, does not mean that they are safe or won't have harmful effects.

It is time for a thorough public discussion and investigation by Congress before any more of these atmospheric tests are conducted by the Navy, NASA, private individuals, the Department of Defense or any universities.

These experiments could have detrimental effects on our atmosphere, human health, the amount of sunlight reaching the earth, and the beneficial ozone layer that protects the earth.

It is time that the public be notified in advance of these tests and also have oversight in order to investigate the consequences of such testing and whether these tests should be conducted in the first place.

The Earth's atmoshere should not be used as a physics laboratory for every questionable and possibly unnecessary experiment that someone thinks up and finds funding for from the taxpayers. We, the taxpayers pay for it, thus we should have oversight.

Respectfully,

Rosalind Peterson

Website: http://californiaskywatch.com

CARE Article: http://newswithviews.com/Peterson/rosalindA.htm

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