

Search for micrometeorites

Overview

Age range: 12 and up

Prep. time: 1 hour

Lesson time: 2 hours

Cost per activity: Low

Includes the use of:
Sieves, water, magnets,
microscopes, and more.

Outline

In this activity, we describe how you and your pupils can partake in the hunt for micrometeorites. By following the steps described in our Students guide, you might be the lucky finder of micrometeorites on the roof of your school or a local warehouse.

Introduction to the subject

Micrometeorites contain the oldest materials that exist, small pieces of minerals from before the first planets in our solar system were formed. Some are even believed to contain extra-terrestrial materials that was once a part of another planetary system, before our sun was formed.

Our solar system is full of dust. Every day and all year, our Earth travels through clouds of interplanetary dust which results in a continuous stream of cosmic particles falling down on the surface of the Earth every day. As much as 30 tons is believed to land on Earth every day, most of this mass comes in form of tiny particles not bigger than a dot.

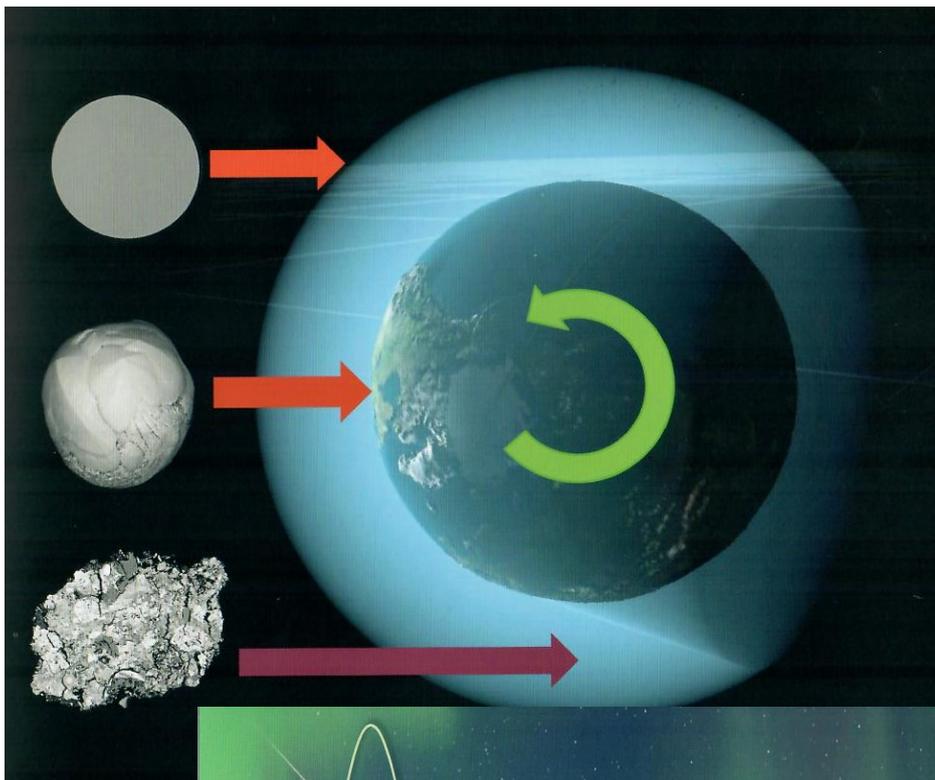
The micrometeorites travel with high velocities as they reach the Earth's atmosphere, causing all of them to melt into small spheres of molten rock. Before hitting ground, they cool down and their surface recrystallizes. Some hit the Earth in a counter-Earth-rotation-direction, these are heated more and thus get a smoother (more melted)



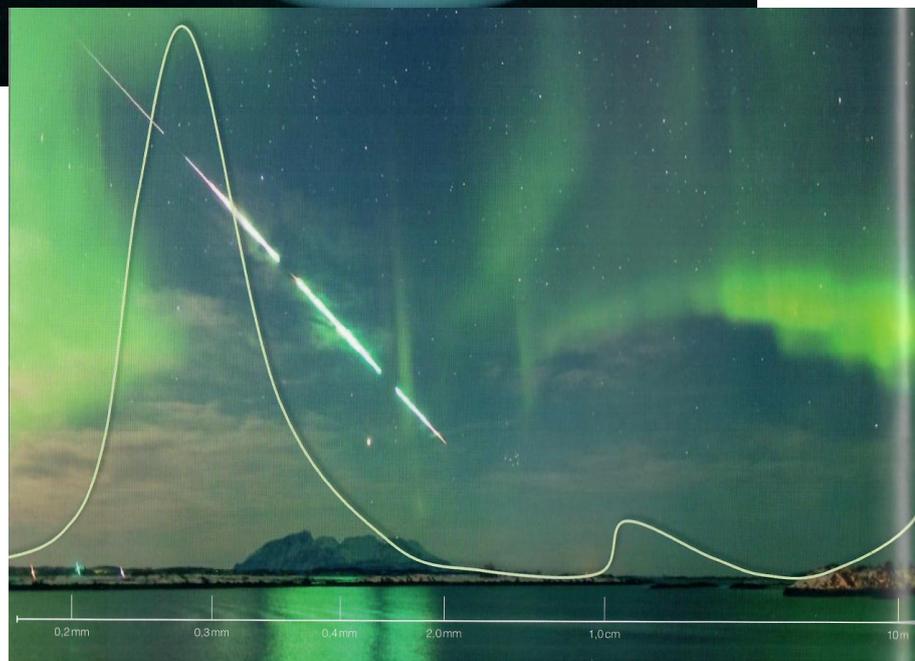


surface and core. Some hit the Earth on the other side (going along our rotation) and are less deformed in their surface details, some even look as rough “untouched” grains. The final visual result of each micrometeorite, thus varies from smooth glass pearls to edgy rocks.

The distribution of sizes of the micrometeorite particles vary also, from the tiniest grain to the largest rocks. What comes down to Earth is more limited, as grains larger than 0,5mm and up to a few centimeters tend to burn up in our atmosphere. Those meteors that are smaller and larger than this size survives and becomes meteorites.



In this activity, we describe how you and your pupils can partake in the hunt for micrometeorites. With simple tools, you and your school class can find micrometeorites on the roof of your own school or a nearby warehouse.





Gathering material

The students could use google-maps to search their local neighborhood looking for businesses having roof tops matching the requirements. Subsequently, they could work out a 'contact/communication protocol' and personally request access to the roofs by phone. Otherwise, this could also function as a somewhat low-level science proposal if done by e-mail.

To collect material, you need to gain access to roof(s) with suitable (metal or plastic) covers. Since it's not given that your pupils will be allowed to enter the roof, it might be a good idea for you to collect the materials (as described in the students guide) for them, and let them take over the work from step 2.

Filtering material

Sieves with the correct mesh size is perhaps the tool that will help you most in the analysis method described in the student guide. It is not necessarily easy to find sieves with mesh sizes of 0,2mm and 0,4mm, but try to get as close as you can.

Report your findings

Once you've found some candidates, take pictures using your mobile phone cameras through the eyepiece of your microscope, and send them to "Project Stardust - Jon Larsen" on Facebook.

Background Material/Knowledge

- Facebook: "Project stardust - Jon Larsen": <https://facebook.com/micrometeorites>
- "In search of stardust" by Jon Larsen
- "On the trail of Stardust" by Jon Larsen

