ANTARCTIC METEORITES

Collected during Antarctic Search for Meteorites (ANSMET) Expeditions and curated at the Johnson Space Center in Houston, Texas

Meteorites are rocks from space that hold clues about our solar system's origins and evolution.

MIL 03356,0

Developed by Astromaterials Research and Exploration Science (ARES), Jacobs/JETS at the NASA Johnson Space Center
NASA’s Antarctic Meteorite Collection includes >22,300 meteorites from asteroids. (Asteroids are remnants of the early solar system.)

Vesta is the largest asteroid in the main asteroid belt.

NASA’s Antarctic Meteorite Collection includes >350 meteorites from Vesta.

NASA’s Antarctic Meteorite Collection includes >15 meteorites from Mars.

NASA’s Antarctic Meteorite Collection includes >30 meteorites from Earth’s Moon.

NASA’s Antarctic Meteorite Collection includes >30 meteorites from Earth’s Moon.
Everywhere! Some create impact craters while others land on the surface waiting to be found!

Deserts: Hot & Frozen
Minimal vegetation and the dark color of meteorites make them easier to spot.

Finding Meteorites

Teams spend ~6 weeks at field sites in Antarctica as part of the ANtarctic Search for METeorites (ANSMET) Program.

ANSMET teams travel on snowmobiles searching for meteorites at field sites along the Transantarctic Mountains.
Barringer Meteor Crater (Arizona)
Diameter = ~1.2 km (0.74 miles)

Antarctica
Collected samples are put in "ice chests" to keep them frozen in the field and as they travel to the lab. (Antarctica to Houston, Texas)

Sealed bags containing samples are stored in freezers in the NASA Meteorite Lab until processed. (Thawed, weighed, photographed, described, named, and chipped for further analysis.)

Samples are processed in a specialized clean lab before sending to scientists for research.

Decoding sample name:
- 3 letters = site found
- 1st 2 #'s = year found
- ,# = parent (0) or split # (followed by assigned lab #)

Sealed bags containing samples are stored in freezers in the NASA Meteorite Lab until processed. (Thawed, weighed, photographed, described, named, and chipped for further analysis.)
Meteorite Lab at NASA’s Johnson Space Center
Meteorites can be divided into three general classifications:

**STONY**
- **Chondrites** (from undifferentiated worlds) [did not separate out to form core, mantle, crust]
- **Achondrites** (from differentiated worlds) [separated out to form core, mantle, crust]

**STONY-IRON**
- **Pallasites** (believed to come from or form between the silicate mantle and molten metal core of a differentiated asteroid)
- **Mesosiderites** (likely formed by collisions of metal-rich and silicate-rich asteroids)

**IRON** meteorites are somewhat rare, dense, and heavy. (from the core of differentiated worlds)
Dark crust found on the exterior of many meteorites. (Coating that forms from heat as they blaze through Earth’s atmosphere.)

Chondrules are ~4.56 billion years old; some of the oldest materials in our solar system!

Thumbprint-like indentations found mostly on iron meteorites. (These depressions can form as some space rocks blaze through Earth’s atmosphere.)

Green colored crystals found typically in pallasites. (The mantle of many rocky solar system worlds is olivine-rich.)

Round inclusions found in chondrites. (Chondrules are ~4.56 billion years old; some of the oldest materials in our solar system!)

Coating that forms from heat as they blaze through Earth’s atmosphere.
How do we know?
Gases trapped in inclusions within sample match gases detected in Mars’ atmosphere.

How do we know?
Composition closely matches samples collected during Apollo Missions to the Moon.

How do we know?
Dawn Mission data support decades of research that help confirm meteorite origins from Vesta.

Continue Exploring!
Meteorites hold clues about our solar system’s origins and evolution! Explore NASA Antarctic meteorites in 3D!