Member Benefits

Free MaPS Journal Access
Enjoy a complimentary online subscription to Meteoritics & Planetary Science (MaPS) and the joint society journal Elements published six times a year.

Research & Community Grants
- **Research Grants:** Support for research activities by student and early-career members.
- **Community Grants:** Support for activities and projects that further the goals of the Meteoritical Society, including education and public engagement activities.

Discounted Meeting Registration
Receive reduced member rates for the annual Meteoritical Society Meeting.

Student Support
Highly reduced membership rates and travel support opportunities for the annual meeting.

Involvement Opportunities
Join committees, participate in Society initiatives, and help shape the future of meteoritics and planetary science.

Global Scientific Community

The Meteoritical Society actively collaborates with:

The Geochemical Society
The Geological Society of America
The Lunar and Planetary Institute
The Barringer Crater Company
International Union of Geological Sciences

Together, we support international research, scientific exchange, and educational outreach in planetary science and meteoritics.

About Us

The Meteoritical Society is an international non-profit organization founded in 1933 to advance the study of meteorites and other extraterrestrial materials.

We have over 1,000 members from more than 60 countries, including scientists, students, enthusiasts, collectors, and educators dedicated to understanding the origin and evolution of our Solar System.

Our members investigate meteorites, cosmic dust, asteroids and comets, natural satellites, planets, impact craters, and the origins of the Solar System. Many contribute to sample-return missions, planetary exploration, and public outreach worldwide.

What We Do

Publish ***Meteoritics & Planetary Science (MaPS)***
Our peer-reviewed journal shares cutting-edge research on meteorites, planetary materials, and Solar System evolution.

Host the ***Annual Meteoritical Society Meeting (MetSoc)***
An international conference bringing together researchers, students, and enthusiasts to share discoveries and build global collaborations.

Promote ***Global Collaboration***
Connecting universities, laboratories, museums, and space agencies such as NASA, JAXA, ESA, and others.

Recognize ***Excellence***
Through Society awards that honor outstanding scientific contributions and community leadership.

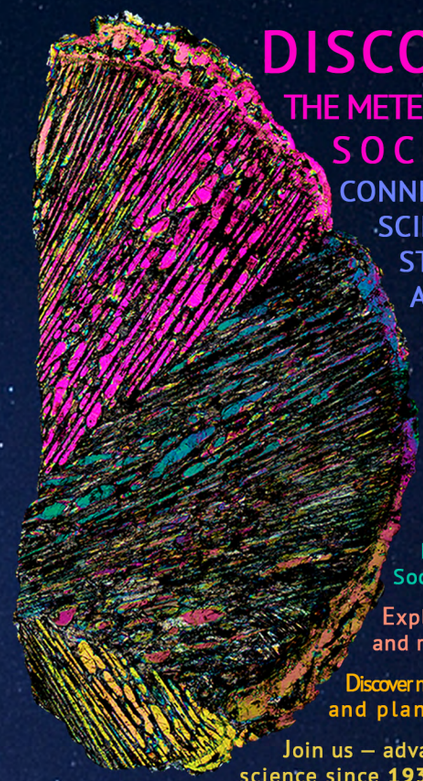
Nomenclature Committee
Oversees the official registry, approval, and naming of all recognized meteorites.

Impact Crater Committee
Maintains scientific standards for identifying and evaluating terrestrial impact structures.

Note:
The Meteoritical Bulletin Database is freely accessible to everyone.

JOIN TODAY
The Meteoritical Society
metsocsec@meteoritical.org
www.Meteoritical.org

The Meteoritical Society



DISCOVER
THE METEORITICAL SOCIETY
CONNECTING SCIENTISTS, STUDENTS, AND SPACE ENTHUSIASTS WORLDWIDE.

Join the global Meteoritical Society community.

Explore membership and resources online.

Discover more about meteorites and planetary science.

Join us – advancing planetary science since **1933.**

SCAN TO EXPLORE
The Meteoritical Society
www.meteoritical.org

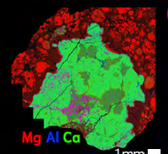
Meteorite | Asteroid | Comet | Planets | Impact Craters

What Do Meteorites Tell us?

Meteorites are natural archives of the early solar system; their components provide direct evidence of its composition, formation environments, and physical conditions.

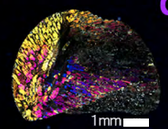
The Meteoritical Society

CAIs – Solar System's First Solids



Calcium–Aluminum–rich Inclusions (CAIs) are the **oldest solids** in the solar system, formed near the young Sun.
Found in **primitive meteorites**, they record the ***early condensation history*** of the solar nebula.

Chondrules – Ancient Molten Droplets

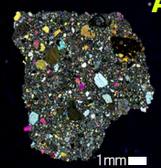


Chondrules are small, **spherical particles** formed by **rapid melting** and **cooling** of dust in the solar nebula. They record **high–temperature processes** from the early solar system.

Chondrites – Primitive Meteorites

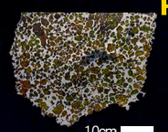
Chondrites are undifferentiated stony meteorites made of **chondrules**, **CAIs**, **matrix**, and **metal grains**. They are divided into **carbonaceous (CC)** and **non–carbonaceous (NC)** groups, which formed in distinct regions of the solar system.

Achondrites – Differentiated Meteorites



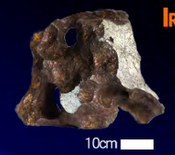
These stony meteorites from **differentiated parent bodies** experienced **melting**, **crust formation**, and **igneous activity**.
Unlike chondrites, they **lack chondrules** and originate from **planets**, the **Moon**, or **asteroids** with complex geological histories.

Pallasites – Stony-Iron Meteorites



These are meteorites made of metallic iron–nickel and green olivine crystals (peridot). They likely formed at the **core–mantle boundary** of a differentiated asteroid, offering insight into **planetary interiors**.

Iron Meteorites – Planetary Core Fragments

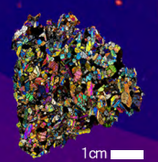


Composed mostly of **iron–nickel metal**, these meteorites come from the **cores of differentiated asteroids**. Their structure reveals how **planetary cores** form and cool over time.

Lunar Meteorites

These **Moon rocks** are ejected by impacts, found on Earth, and Identified by **composition** and **isotopic signatures** matching Apollo samples. They reveal the Moon's crust, volcanism, and impact history.

Martian Meteorites



Rocks are blasted off **Mars** by large impacts and land on Earth. They are identified as Martian by their distinct chemical and isotopic signatures that match spacecraft data. They reveal Mars' **geology**, **volcanism**, and past **water activity** .

Near-Earth Asteroids – Sample-Return Missions

NEAs are small rocky bodies whose orbits bring them close to Earth. Spacecraft missions like **JAXA's Hayabusa2 (Ryugū)** and **NASA's OSIRIS-REx (Bennu)** have returned pristine, uncontaminated samples preserved in their original space environment.

Organic Matter – Cosmic Carbon

Carbon–based molecules such as **amino acids**, **hydrocarbons**, and **kerogen–like macromolecules** formed in space before life arose on Earth.
Found as **soluble** or **insoluble** material in meteorites, they offer clues to the chemistry that led to life's origins.

Asteroids – Ancient Rocky Remnants

They are small, airless, **rocky objects** that orbit the Sun, mostly found in the **asteroid belt** between **Mars** and **Jupiter**. They are remnants of the early solar system—primitive bodies that never grew large enough to become planets—and range in size from tiny pebbles to hundreds of km across.

Cosmic Dust – Tiny Grains from Space

Cosmic dust are microscopic particles of **rock** and **ice** drifting through **space**. These ancient grains, formed in **stars** and the **early solar nebula**, continuously fall to Earth, carrying clues to the origins of planets and organic matter.

Comets – Icy Bodies with Glowing Tails

Comets are **Icy** solar system bodies that release **gas** and **dust** when near the Sun, forming bright comas and tails. They preserve **volatile elements** and organic compounds that may have contributed to the emergence of life on Earth.

Meteoroids – Fragments Traveling Through Space

They are solid objects, typically ranging from **dustsized grains to meter scale fragments**, traveling through interplanetary space. Most originate from asteroids or comets and occasionally collide with planets.

Fireballs – Exceptional Bright Meteor

They are very bright **meteors** caused by large **meteoroids** entering Earth's atmosphere. They help scientists **track meteorite falls**, study **entry dynamics**, and reconstruct their **orbits**, revealing where in the solar system the material originated.

Meteors – Bright Streak of Light

The visible **streaks of light** ("shooting stars") produced when a **meteoroid** enters **Earth's atmosphere** at high velocity causes the surrounding air and the object itself to heat and glow due to frictional ablation.

Meteorites – Space Rock Reaches Earth

Fragments of **meteoroids** that survive their intense heating as they pass through Earth's atmosphere and land on the surface are called meteorites.
When freshly fallen, they often have a **dark fusion crust**—a thin, glassy layer formed by melting during entry. Some are recovered soon after landing (**falls**), while others are discovered later on the ground (**finds**).
Meteorites provide direct evidence of the composition and evolution of asteroids and planets.

Breccia Meteorites & Impact Processes

Asteroid collisions generate powerful impacts that break, melt, and mix surface materials.
These events create **breccias—meteorites** made of rock fragments fused together—which preserve the **shock** history, surface **mixing**, and **evolution** of asteroid.

Impact Craters – Traces of Cosmic Impacts

Impact craters form when asteroids or comets collide with a planetary surface at **high speed**.
They preserve the **energy** and **geological effects** of these violent events, offering insight into the solar system's dynamic history.

White clast in the Murchison CM2 chondrite. © Institut für Planetologie, University of Münster.