IRON METEORITES

Heavy metal

Iron meteorites make up less than 10 percent of space rocks but are easy to identify on Earth. /// BY MICHAEL E. BAKICH

When most people think of a meteorite, they visualize a chunk of iron, perhaps one they've seen displayed at a museum or planetarium. On Earth, iron meteorites look out of place in regions with no iron-bearing minerals.

With a metal detector, you can locate iron meteorites that have lain dormant for centuries. In space, stone meteoroids (which originate in asteroids' rocky crusts) far outnumber irons, which come from asteroid cores.

MAP: NASA'S EARTH OBSERVATORY/FRANCIS REDDY/*ASTRONOMY*: ROEN KELLY

ALL METEORITE IMAGES: ROBERT HAAG, EXCEPT WHERE NOTED

Woodbine (Illinois)

Fine octahedrite — 471grams

In the spring of 1953, farmer Henry Albrecht plowed up a 106-pound (48.2 kg) iron meteorite about a mile west of Woodbine, Illinois. About 20 percent of the meteorite is made up of silicate inclusions. The metallic portion contains 10.6-percent nickel.

Landes (West Virginia)

Ungrouped octahedrite — 337g

Meteoriticists classify this meteorite as chemically anomalous. It contains pyroxenes and 6.3-percent nickel. A single 154-pound (70 kg) specimen was found in 1930, but it wasn't recognized as a meteorite until 1968.

Shingle Springs (California)

Ungrouped ataxite — 456g

Ataxites (from the Greek for "no structure) are meteorites that show no Widmanstätten lines when etched. High nickel content makes these meteorites the most rust-resistant of the irons. The Shingle Springs ataxite contains 17-percent nickel.

Canyon Diablo (Arizona)

Coarse octahedrite — 1.5 kg

The world's most famous — and best preserved — impact crater lies 3 miles west of Canyon Diablo, Arizona. The crater measures three-quarters of a mile (1.65 kilometers) across and 600 feet (183 meters) deep.

Ocotillo (California)

Coarse octahedrite — 738g

A meteorite hunter found a 28.6 kilogram specimen 5 miles north of Ocotillo. The iron contains 7-percent nickel, 0.5-percent cobalt, and tiny amounts of other metals, including 1.65 parts-per-million of gold.

Odessa (Texas)

Coarse octahedrite — 29 kg

The first person to recognize the Odessa crater as meteoritic was Daniel Barringer, who also identified Meteor Crater's origin. The Odessa crater measures 535 feet (165 meters) across.

TONY KOSTUSIK

Tinnie (New Mexico)

Plessitic ataxite — 291g

In 1978, an Afghani graduate student doing research on Barbary sheep found a single 34-pound (15.3 kg) specimen of this meteorite. He gave it to the family he was staying with, who kept it in their living room for 20 years. It contains 18.4-percent nickel.

Toluca (Mexico)

Coarse octahedrite — 3.2 kg

Discovered in 1776 by explorers in Xiquipilco, Mexico, which lies in the Toluca Valley, iron from this meteorite had been used for centuries by natives to make tools. The iron contains 8-percent nickel.

Caddo County (Oklahoma)

Ungrouped octahedrite — 4 kg

While plowing a field in 1987, a farmer found a 35-pound (16.1 kg) specimen and an additional 5 pounds (2.3 kg) of fragments of this meteorite. It contains 9-percent nickel and widely separated, poorly mixed silicate inclusions.

1 gram = 0.035 ounce
1 kilogram = 2.2 pounds
1 kilometer = 0.62 mile

Astronomy magazine

Cape York (Greenland)

Medium octahedrite — 37 kilograms

In 1894, Admiral Robert Peary identified three pieces of Cape York as meteorites. The largest — a 34-ton giant called Ahnighito (the "Tent") — now resides in New York's American Museum of Natural History.

Steinbach (Germany)

Chemically anomalous — 45g

A single specimen of this meteorite, measuring 16 inches (40 cm) across, was found in 1724. Silicate inclusions make up two-thirds of its mass, and the metal is 9-percent nickel.

Twannberg (Switzerland)

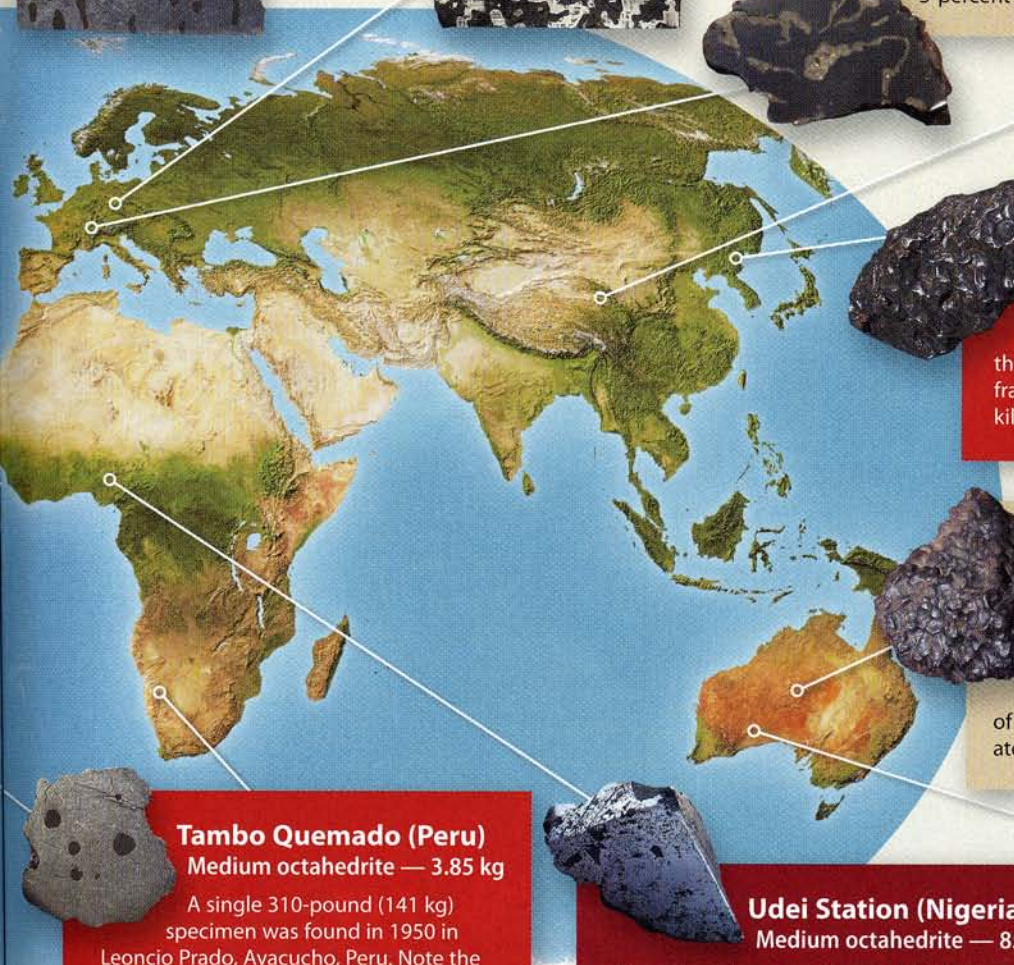
Hexahedrite to coarsest octahedrite — 38g

A farmer found a single 35-pound (16 kg) piece in a barley field after he'd finished plowing. Note the large schreibersite (an iron-nickel mixture containing phosphorus) crystals snaking through the rest of the nickel-iron matrix. This iron contains 5-percent nickel.

Nantan (China)

Medium octahedrite — 1.5 kg

Chinese inhabitants witnessed this meteorite fall in 1516. The largest specimen recovered weighs 4,400 pounds (2,000 kg). Nantan contains 6.8-percent nickel. Most specimens are weathered and fracture easily because of moisture they absorbed.



Sikhote-Alin (Russia)

Coarsest octahedrite — 117 kg

At 10:38 A.M. local time on February 12, 1947, witnesses saw a fireball brighter than the Sun. About 4 miles up, this meteorite fragmented and scattered over a 1-square-kilometer area.

Henbury (Australia)

Medium octahedrite — 30 kg

The Henbury meteorite fell roughly 5,000 years ago in Australia's Northwest Territory. Since 1931, meteorite hunters have recovered hundreds of fragments and located at least 13 associated craters. Henbury is 7.5-percent nickel.

Tambo Quemado (Peru)

Medium octahedrite — 3.85 kg

A single 310-pound (141 kg) specimen was found in 1950 in Leoncio Prado, Ayacucho, Peru. Note the large dark troilite nodules. Troilite is a combination of two elements, comprising 65.5-percent iron and 34.5-percent sulphur.

Udei Station (Nigeria)

Medium octahedrite — 851g

This meteorite was a witnessed fall in the spring of 1927. Natives heard the event and located the iron in the Benue River area. A single 224-pound (102 kg) piece was recovered. Udei Station contains 8.8 percent nickel and silicate inclusions.

Mundrabilla (Australia)

Medium octahedrite — 550 kg

Small chunks of this meteorite were found in 1911, but the two main masses — weighing 12 and 5½ tons — were discovered in 1966. The sulfide and silicate inclusion weathered out, leaving behind the distinctive coral-like texture of the nickel-iron.

Campo del Cielo (Argentina)

Coarse octahedrite — 22 kg

"Campo del Cielo" means "field of heaven." Spanish explorers found this meteorite in 1576. The largest of the 12 craters created by the fall measures 256 by 213 feet (78 by 65 meters). Campo is 6.6-percent nickel.

Gibeon (Namibia)

Fine octahedrite — 65 kg

First reported in 1838, many tons of this meteorite have been recovered. The strewn field of the Gibeon fall is the largest in Africa, spanning 182 by 55 miles (400 by 120 km).