High-temperature Melted Glass

Meltglass was produced by the YDB impact/airburst

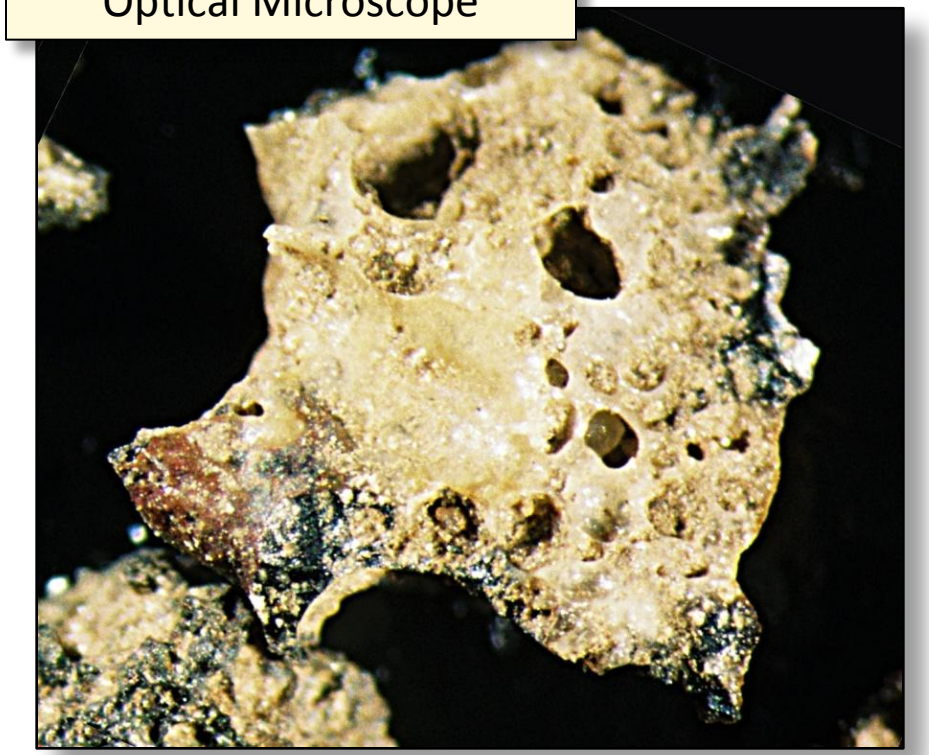
- It was produced by melting sediment on Earth's surface
- It consists mostly of melted quartz (SiO_2), aluminum oxide (Al_2O_3), and iron (FeO)
- YDB meltglass formed at temperatures from 1200°C to 2000°C (3600°F)
- Meltglass can form by lightning strikes, but unlike YDB glass, lightning glass has a distinctive, hollow, tubular shape
- Volcanoes make glass and tephra, but have different compositions from YDB glass
- YDB meltglass can only come from ***a)*** impact craters or ***b)*** airbursts, when a hot plume of high-velocity gases melt sediment beneath the fireball

The same type of glass was produced when known asteroids or comets formed craters or exploded in the air

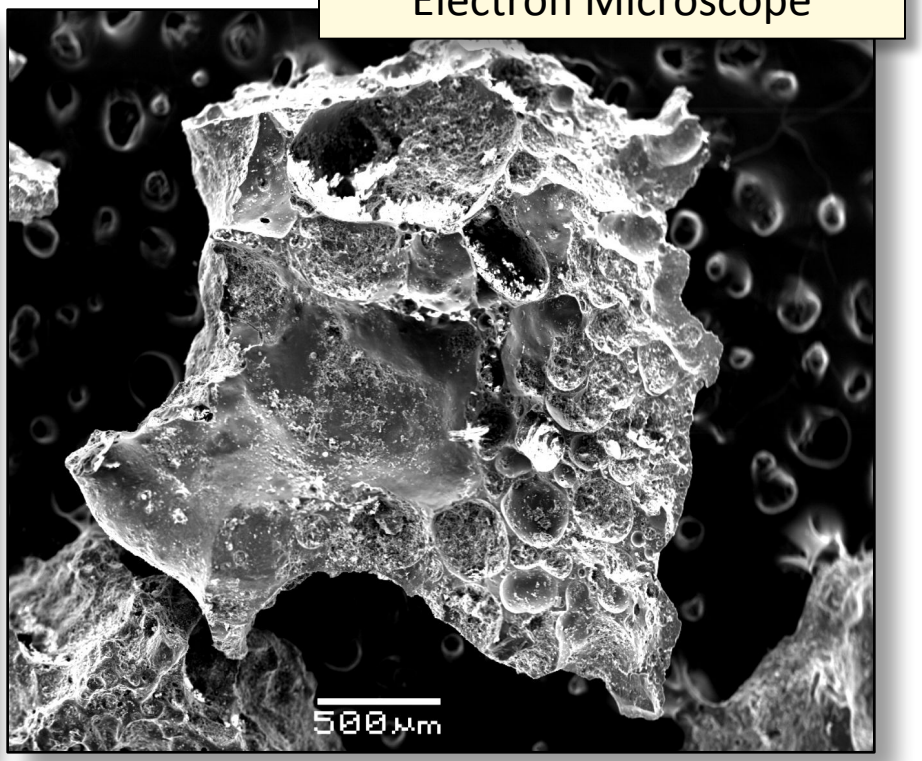
NOTE: this website is a brief, non-technical introduction to the YDB impact hypothesis. For in-depth information, go to "Publications" to find links to detailed scientific papers.

YDB Impact Meltglass

Optical Microscope



Electron Microscope



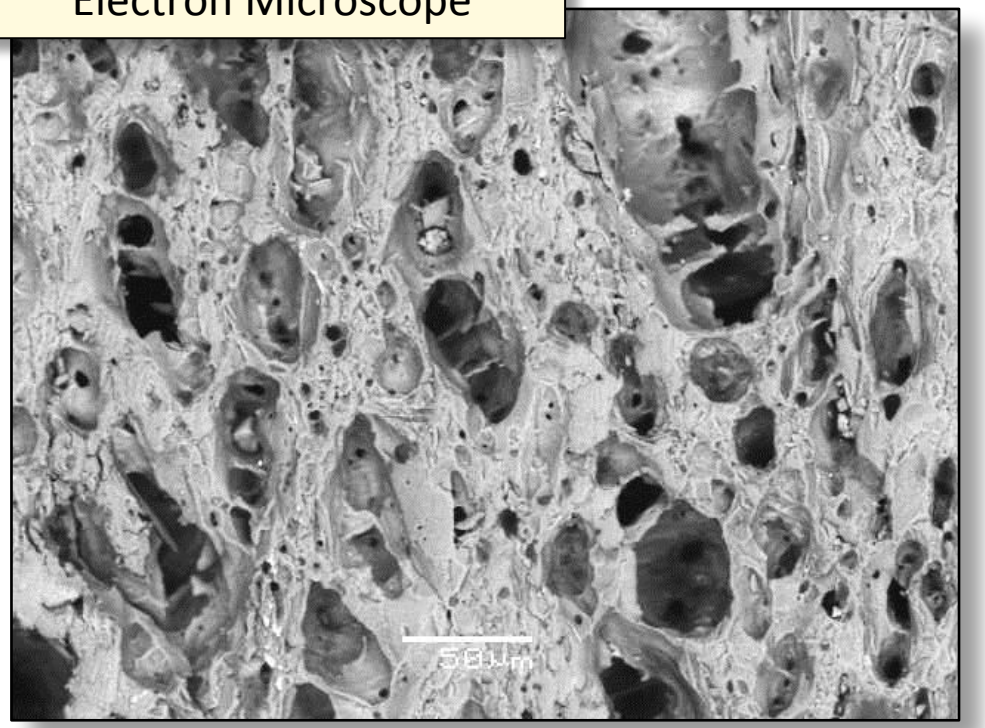
COMPOSITION	%
Quartz	61%
Aluminum Oxide	22%
Iron Oxide	6%

SOURCE ROCK:

This YDB meltglass formed during impact by rapidly melting shale or clay at high temperatures

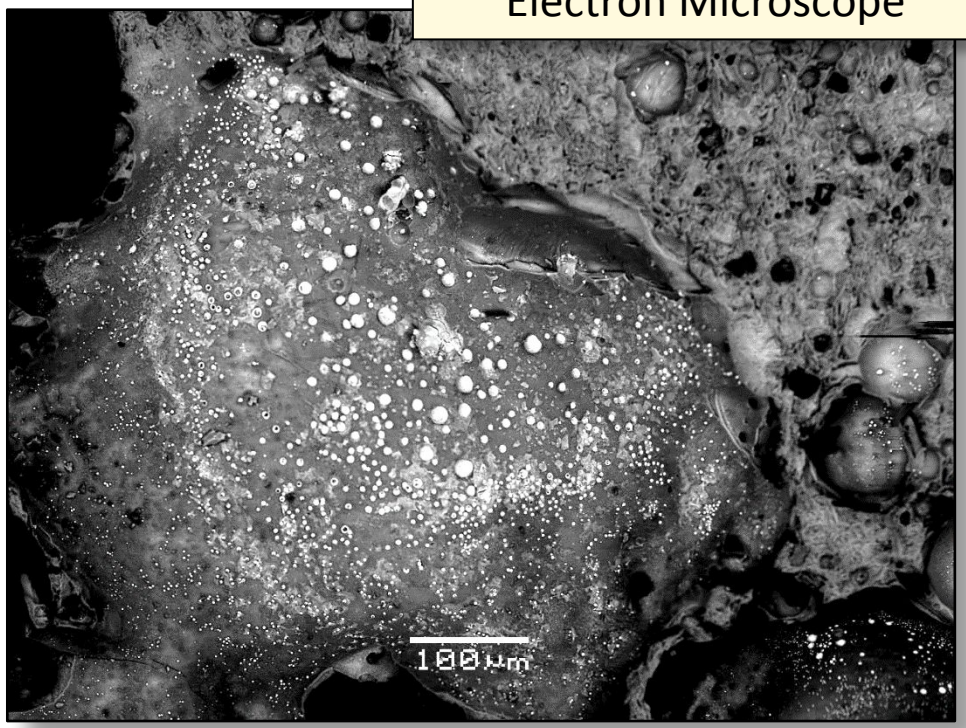
YDB Impact Meltglass

Electron Microscope



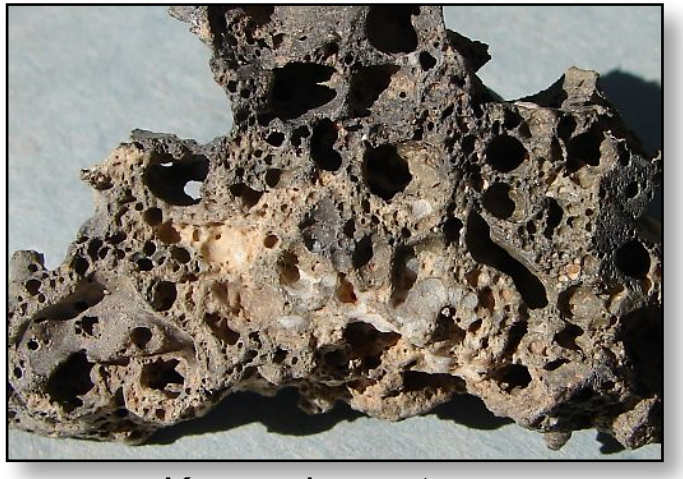
YDB meltglass formed during impact by rapidly melting and cooling the clay mineral, kaolinite, at high temperatures (about 1750 °C, or 3200 °F)

Electron Microscope



YDB meltglass formed when iron-rich rock melted at high temperatures (about 1500 °C, or 2700 °F), forming tiny iron spherules (white dots).

Bubbled YDB meltglass compared to other glasses



Known impact, Argentina

YDB glass looks the same as meltglass from known cosmic impacts.

YDB meltglass

Known Impact, Dakhleh, Egypt

Glass from atomic bomb blast, called “trinitite”

Colors differ because the source rocks had different chemical compositions

Known Impact, Chiemgau, GER

Credit: Ernston, Kort. 2011

Plant imprints in YDB Melted glass

Reed stem
(ribbed)

Reed leaf
(ribbed)

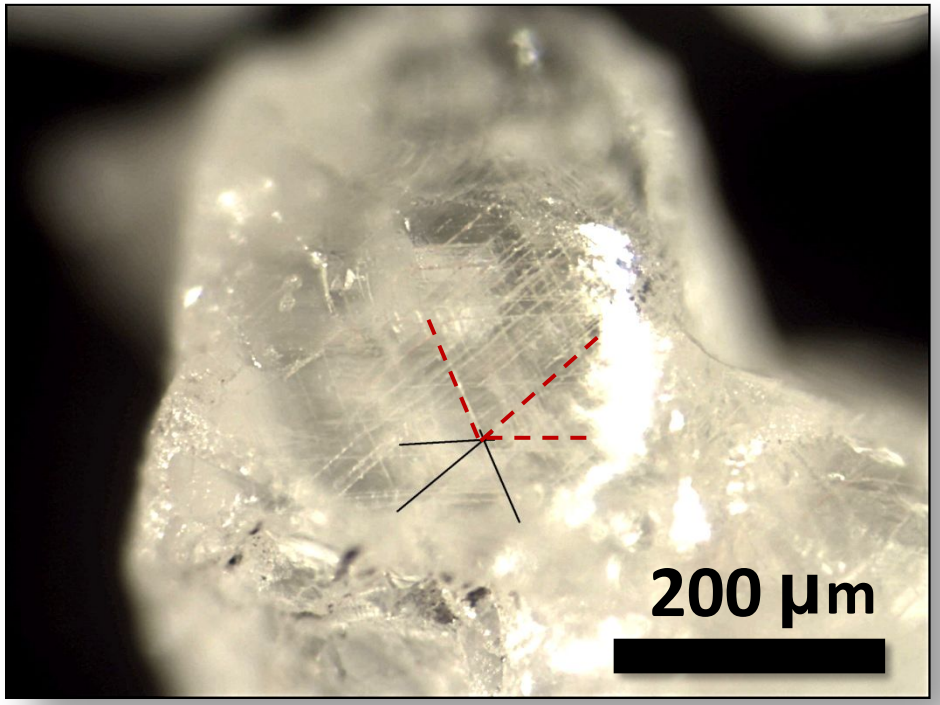
YDB Meltglass (ribbed)

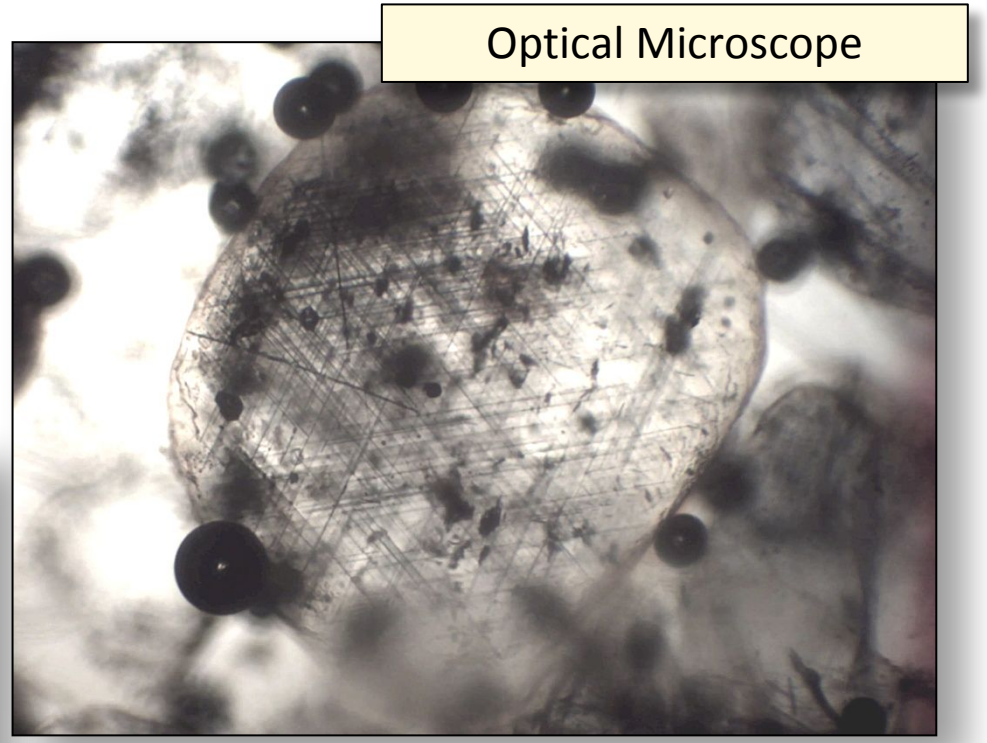
YDB meltglass: The 1-mm-wide meltglass (center) contains impressions of plant structures, including string-like “phytoliths” that provide structural support for plants and “stomata” that allow plants to breathe. The rib-like pattern compares well with those on the stem and leaves of common reeds.

Left, stem; credit: Ohio State Weed Lab, 2008

Right, leaf; credit: Ackley, Bruce, 2011

Shocked Quartz from YDB in NJ





Three sets of shock fractures

Quartz is "shocked," when it is subjected to high pressures and temperature that cause closely spaced, parallel cracks in the quartz grain. Shocked quartz is a strong indicator of a cosmic impact.