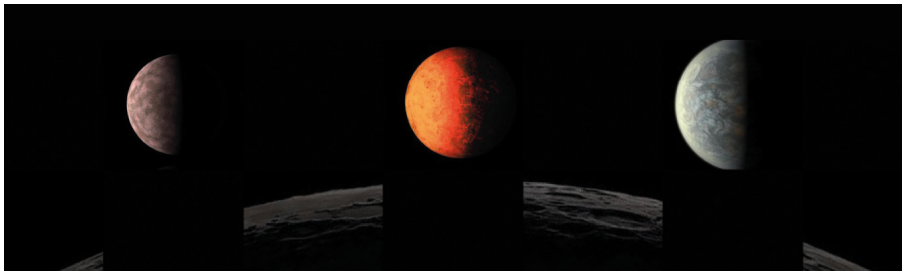

Contribution ID: **43** Type: **Poster**

Geochemistry, geochronology, and fall characteristics of the Ribbeck meteorite.

Friday 24 October 2025 12:30 (1 hour)

Asteroid 2024 BX1 was discovered just 3 hours before it entered the Earth's atmosphere, which happened on January 21, 2024. This allowed acquisition of 17 recordings from the fireball stations, on the basis of which, the strewn field was precisely calculated and the heliocentric orbit of this meteoroid was determined. The aphelion distance of this asteroid's orbit (Q=1.838 AU) lies in the innermost region of the asteroid belt, suggesting that the parent body for aubrites are E/X-type asteroids from the Hungaria family and the main framework mineral is enstatite ($Mg_2Si_2O_6$).

The author went to the area of the strewn field and found a piece of a meteorite, which was subjected to further analysis. A series of studies were conducted using Raman spectroscopy, electron microscopy (SEM), electron microprobe (EPMA) and laser ablation with inductively induced plasma coupled mass spectrometry (LA-ICP-MS). Interpretation of the results allowed the identification of previously undescribed mineral phases, including K-bearing minerals such as roedderite.

The presence of roedderite underscores that the parent body must have been highly differentiated to concentrate potassium as a major mineral component. In situ Rb/Sr geochronology was performed on roedderite within the Ribbeck aubrite, yielding a weighted average of 4582 ± 23 Ma (MSWD: 0.42; n:16). The age records the aubrite formation and was not reset by later events, unlike the more sensitive K-Ar and (U-Th)/He methods that have been used to date this meteorite.

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