

## TEMPLATE FOR ABSTRACT SUBMISSION

### EXPERIMENTAL SIMULATION OF FORMATION OF LUNAR IMPACT-INDUCED CONDENSATES.

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**Introduction:** Processing of silicates during hypervelocity collisions is a fundamental process which affects the evolution of solid material in the universe and in the Solar system as well. Impacts on planetary surfaces proceed at velocities in excess of 10 km/s and provide partial or complete vaporization of colliding material. Subsequent expansion and cooling of impact-generated vapor plumes produce condensed particles with nanometer to micron sizes. Investigation of trends of differentiation of silicate material during impact-induced vaporization is important for understanding of early evolution of planetary bodies.

**Simulation of lunar condensates:** The Moon has preserved impact-produced condensates which can be found on surfaces of lunar rocks and glasses. These condensates have composition noticeably different from melts [e.g. 1, 2] that shows deep differentiation of silicate material during high-temperature pulse processing.

The goal of our work was to compare morphology of lunar condensates with that of experimentally produced condensates. Simulation of impact-generated condensates was done using laser pulse technology [3]. We used diverse samples representing terrestrial rocks and minerals, meteorites, and volatile-rich mixtures.

We have discovered several types of condensates many of which have twins among lunar condensates (e.g. Fig. 1 and 2). Histograms indicate that both lunar and condensed particles from experiments have main mode about 30-50  $\mu\text{m}$ .

**Acknowledgment:** This work was supported by RFBR grants 07-05-01054 and 08-05-00786.

#### References:

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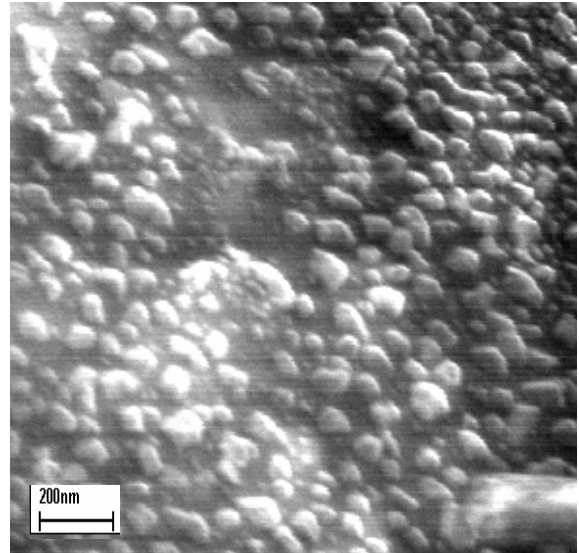


Fig.1. Condensed particles on the surface of Apollo-17 glass spherule.

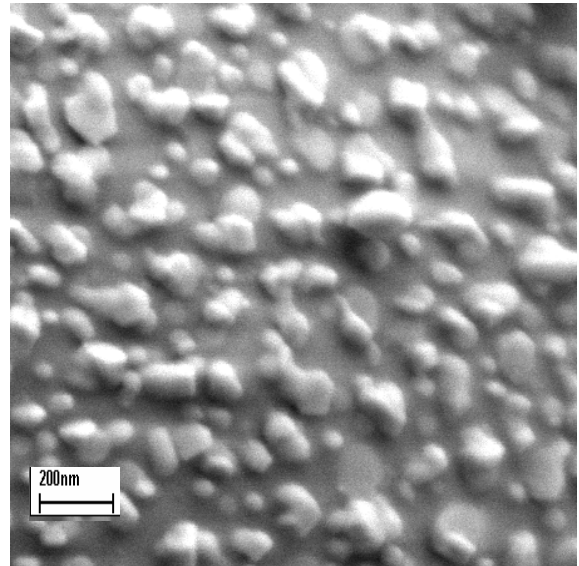


Fig.2. Condensed particles on the surface of melted droplet from a comet impact simulation experiment.