

## The roles of hypervelocity impacts on the surface evolution of the Hadean Earth

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Impact bombardments are the main driving forces of the surface evolution on the Hadean Earth. Typical impact velocity onto the Earth is estimated to become 20 km/s, resulting in an extremely-high energy density to be about 200 MJ/kg. The energy density corresponds to a temperature and pressure of 200000 K and 600 GPa, respectively. Thus, hypervelocity impacts would cause physical/chemical processes, which is never driven under the mean field on the Hadean Earth, resulting in an intense and impulsive catastrophic perturbation. Chemical products produced by such high-energy collisions might be fixed into ancient stratifications as unique chemical features. We are constructing a new experimental system at Planetary Exploration Research Center of Chiba Institute of Technology to understand the roles of impact-driven chemical processes on the surface environment on the Hadean Earth. In the presentation, we will present a brief review about the thermodynamics behind the impact-driven processes and will discuss a future plan induced by the new experimental system.

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