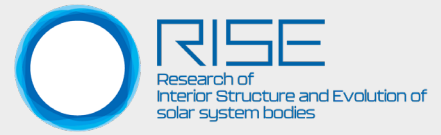


Promotion of planetary geodesy in Martian Moons eXploration mission (MMX) and Jupiter Icy Moons Explorer (JUICE) mission



7. Science Goals

7-1. RISE Project participates in and contributes to planetary explorations as a research center of the Japanese planetary science community aiming to understand internal structures and evolution of the solar system bodies.

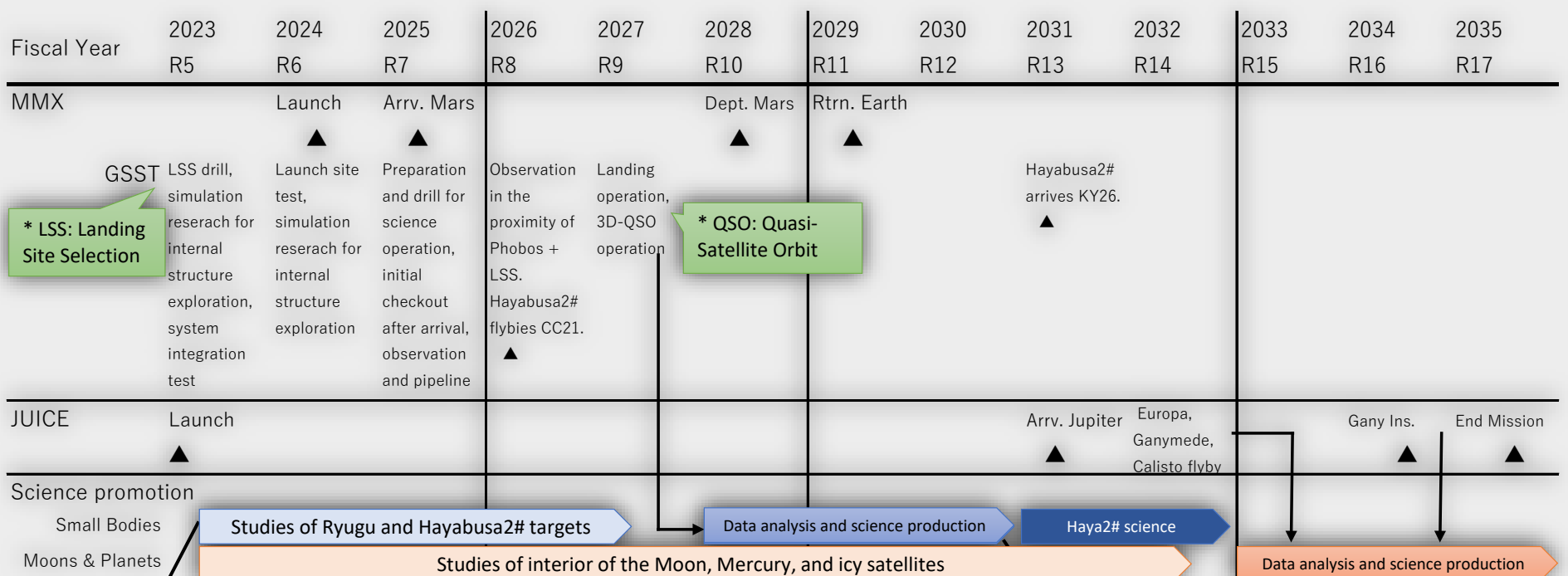
7-2. We wish to elucidate the development of a habitable environment and its sustainability in the solar system and exoplanets.

8. Scientific Objectives

8-1. RISE Project leads MMX Geodesy Science Strategy Team (GSST), contributing to science observation and spacecraft orbit determination in the proximity of Phobos, as well as pipeline data process and analysis.

8-2. We contribute to elucidating the origin and evolution of planetary systems and promoting an understanding of the development of habitable environments in the JUICE mission of the European Space Agency.

5-6. Timetable



9. Science Investigation

9-1. Albedo data of Ryugu shall be published in the forms of time series and grid map. The spacecraft flybys CC21 in FY 2026, but no LIDAR measurement is planed. Surface conditions of fast rotator, such as shape, albedo, and dust distribution will be studied in comparison with Ryugu.

9-3. New technique to estimate fine-scale roughness from returned-pulse profile shall be developed. Tidal heating model will be coupled with convection of subsurface ocean, possibly resulting in non-uniform heat flow and consequent heterogeneous crust. Porous flow within a solid core may need to be incorporated.

9-2. As the altitudes of the spacecraft descends, Stokes coefficients of Phobos gravity will be determined from low to high orders using both tracking data and landmarks in the camera images. Shape model will be constructed to be used for geodetic analysis of internal structures. Hayabusa2# target, KY26, will be investigated, too.

9-4. Tidal deformation (and its horizontal variation) of the ice-crust, movement of rotational axis, and variation of spin rate are analyzed via spacecraft orbit determination with European team.

13. Efficient personnel change within/out of NAOJ is crucial.