

SPACE EXPLORATION SYMPOSIUM (A3)  
Space Exploration Overview (1)

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## JPL INNOVATION FOUNDRY

**Abstract**

Space science missions are increasingly challenged today: in ambition, by progressive sophistication of testable hypotheses; in development, by the increasing finesse of advanced technologies; in budgeting, by the decline of flagship-class mission opportunities; in management, by expectations for breakthrough science despite a risk-averse programmatic climate; and in planning, by increasing competition for scarce resources. How are the space-science missions of tomorrow being formulated? The paper describes the JPL Innovation Foundry, created in 2011 to respond to this evolving context. The Foundry integrates methods, tools, and experts that span the mission concept lifecycle. Grounded in JPL's heritage of missions, flight instruments, mission proposals, and concept innovation, the Foundry seeks to provide continuity of support and cost-effective, on-call access to the right domain experts at the right time, as science definition teams and Principal Investigators mature mission ideas from "cocktail napkin" to PDR. The Foundry blends JPL capabilities in proposal development and concurrent engineering, including Team X and RMA (Relational Mission Architecture), with new approaches for open-ended concept exploration in earlier, cost-constrained phases, and with ongoing research and technology projects. It applies complexity and cost models, project-formulation lessons learned, and strategy analyses appropriate to each level of concept maturity. The Foundry is organizationally integrated with JPL advanced-development program offices; staffed by JPL's line organizations for engineering, science, and costing; and overseen by senior Laboratory leaders to assure experienced coordination and review. Incubation of each concept is tailored depending on its maturity and proposal history, and its highest-leverage modeling and analysis needs.