Center Innovation Fund: ARC CIF

Development of an X-ray tube for planetary instruments

Completed Technology Project (2017 - 2018)

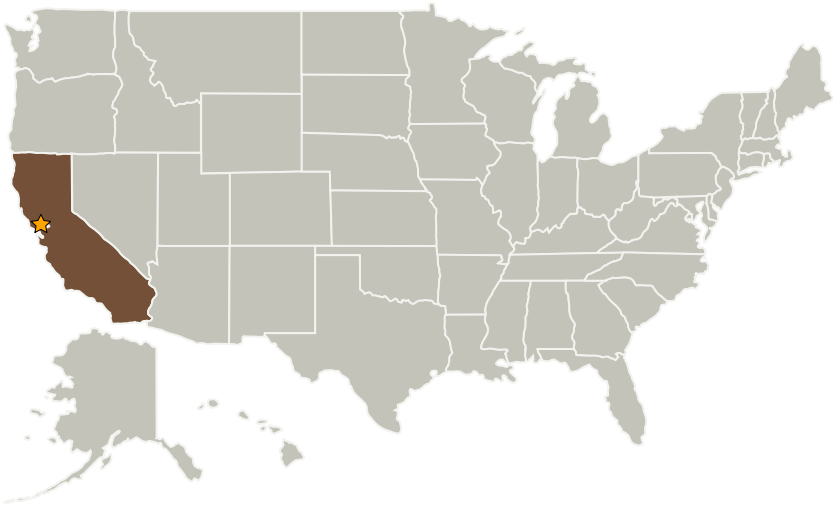
Project Introduction

We will mate a HVPS from Battel Eng. with an xRT from R\xd6NTGEN-TECHNIK WARRIKHOFF (RTW). We will test and evaluate xRT prototypes for xRD/xRF, and develop a high-TRL X-ray source design. Next steps include improving xRT design and refining flight xRT controller and HVPS (proposal to PICASSO or MatISSE). The X-ray source design will be included in the Mapx Europa Lander proposal to be submitted later this year (est. AO release Aug., 2017).

Anticipated Benefits

This spacecraft qualifiable X-ray tube will be use in our recently funded DALI project, and in future instruments for xRD and xRF, such as next-generation CheMin instruments and the Mapx instrument currently funded under the MatISSE program.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Baja Technology LLC	Supporting Organization	Industry Small Disadvantaged Business (SDB)	Tempe, Arizona
Battelle Memorial Institute	Supporting Organization	R&D Center	Columbus, Ohio
Röntgen-Technik Warrikhoff(RTW)	Supporting Organization	Industry	Neuenhagen bei Berlin, Outside the United States, Germany
SETI Institute(SETI)	Supporting Organization	Academia	Moffett Field, California

Primary U.S. Work Locations
California

Project Transitions

October 2017: Project Start

September 2018: Closed out

Closeout Summary: We developed and tested a spacecraft-qualifiable X-ray tu be suitable for use in a miniaturized xRD/xRF instrument. TRL-6

Project Website:

https://www.nasa.gov/directorates/spacetech/innovation_fund/index.html#.VC

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Center Innovation Fund: ARC CIF

Project Management

Program Director:

Michael R Lapointe

Program Manager:

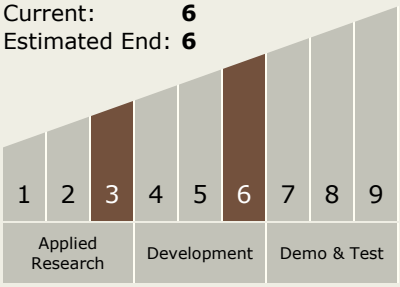
Harry Partridge

Principal Investigator:

David F Blake

Technology Maturity (TRL)

Start: **3**
Current: **6**
Estimated End: **6**



Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  └ TX06.2 Extravehicular Activity Systems
    └ TX06.2.4 Decompression Sickness Mitigation

Target Destinations

Earth, The Moon, Mars