

Your abstract submission has been submitted for the 2015 AGU Fall Meeting. You will receive an email confirmation.

Click [HERE](#) to print this page now.

Receipt of this notice does not guarantee that your submission was accepted for the 2015 AGU Fall Meeting. All submissions are subject to review and acceptance by the Program Committee. You may review or edit your abstract submission until the deadline of 5 August 2015 23:59 EDT/03:59 +1 GMT. After this date, no further edits will be made to the submission.

Trojan Tour and Rendezvous (TTR): A New Frontiers Mission to Explore the Origin and Evolution of the Early Solar System

James F Bell III, Arizona State University, School of Earth and Space Exploration, Tempe, AZ, United States and the International TTR Science Team

Abstract Text:

The orbital properties, compositions, and physical properties of the diverse populations of small outer solar system bodies provide a forensic map of how our solar system formed and evolved. Perhaps the most potentially diagnostic, but least explored, of those populations are the Jupiter Trojan asteroids, which orbit at ~5 AU in the L4 and L5 Lagrange points of Jupiter. More than 6200 Jupiter Trojans are presently known, but these are predicted to be only a small fraction of the 500,000 to 1 million Trojans >1 km in size. The Trojans are hypothesized to be either former Kuiper Belt Objects (KBOs) that were scattered into the inner solar system by early giant planet migration and then trapped in the 1:1 Jupiter mean motion resonance, or bodies formed near 5 AU in a much more quiescent early solar system, and then trapped at L4 and L5.

The 2011 Planetary Science Decadal Survey identified important questions about the origin and evolution of the solar system that can be addressed by studying of the Trojan asteroids, including: (a) How did the giant planets and their satellite systems accrete, and is there evidence that they migrated to new orbital positions? (b) What is the relationship between large and small KBOs? Is the small population derived by impact disruption of the large one? (c) What kinds of surface evolution, radiation chemistry, and surface-atmosphere interactions occur on distant icy primitive bodies? And (d) What are the sources of asteroid groups (Trojans and Centaurs) that remain to be explored by spacecraft?

The Trojan Tour and Rendezvous (TTR) is a New Frontiers-class mission designed to answer these questions, and to test hypotheses for early giant planet migration and solar system evolution. Via close flybys of a large number of these objects,, and orbital characterization of at least one large Trojan, TTR will enable the first-time exploration of this population. Our primary mission goals are to characterize the overall surface geology, geochemistry and mineralogy of these worlds; to characterize their internal structure and dynamical properties; to investigate the nature, sources and history of activity on these bodies; and to explore the diversity of the broader Trojan asteroid population.

Topic Selection: Science from Current and Future Planetary Missions

Title: Trojan Tour and Rendezvous (TTR): A New Frontiers Mission to Explore the Origin and Evolution of the Early Solar System

Preferred Presentation Format: Assigned by Program Committee (Oral or Poster)

Invited 1

First Presenting Author

Presenting Author

James F Bell III

Primary Email: Jim.Bell@asu.edu

Phone: 4809651044

Affiliation(s):

Arizona State University
School of Earth and Space Exploration
Tempe AZ 85287 (United States)

Student: No

If necessary, you can make changes to your abstract submission

- To access your submission in the future, point your browser to: [Full Menu Options](#).
- Your Abstract ID# is: 62002.
- Any changes that you make will be reflected instantly in what is seen by the reviewers.
- After the abstract proposal is submitted, you are not required to go through all submission steps to make edits. For example, click the "Authors" step in the Abstract Submission Control Panel to edit the Authors and then click save or submit.
- When you have completed your submission, you may close this browser window or submit another abstract <http://fallmeeting.agu.org/2015/Sessionviewer>.

[Tell us what you think of the abstract submission process](#)