J-ASTEROID, A VISUALIZATION AND MISSION PLANNING TOOL FOR SMALL BODIES. M. E. Smith[1], P. R. Christensen[1], S. Anwar[1] and S. Dickenshied[1], [1]Arizona State University, School of Earth and Space Exploration, Mars Space Flight Facility.

Introduction: The history of our solar system is an topic that we have pondered for centuries. The answers to our questions on the formation of our solar system, Earth and even Earth's oceans may reside in asteroids. Asteroids could be the precursor to the origins of life and, with the continuous improvement of technology and the exploration of our solar system, they are the next step for robotic exploration.

JMARS (Java Mission-planning for Analysis and Remote Sensing) is a Geographic Information System (GIS) that was developed by Arizona State University's Mars Space Flight Facility. JMARS was developed as a mission planning and data-analysis tool for NASA's orbiters, instrument teams, students and even the general public. The mission planning tool was originally written for the THEMIS (THermal EMision Instrument System) instrument on board the Mars Odyssey spacecraft. JMARS has a variety of planetary bodies within the GIS such as many of our solar system's planets, satellites and asteroids. In recent years, JMARS has been enhanced to support the exploration of asteroids and small celestial bodies. These enhancements led to the creation of J-Asteroid. J-Asteroid is currently being used on two NASA funded missions that are exploring small bodies.

The Dawn spacecraft was launched on September 27, 2007 and its current objective is to visit the two largest objects in the asteroid belt, Vesta and Ceres. Dawn has already visited Vesta and is currently on course to reach Ceres by April, 2015. If Dawn successfully reaches Ceres, it will be the first spacecraft to travel to two extraterrestrial bodies. J-Asteroid is serving as the data visualization tool for the Dawn science team.

J-Asteroid has also been chosen by the OSIRIS-REx mission to be the planning and visualization tool.

OSIRIS-REx Mission: The OSIRIS-REx mission is being operated by the University of Arizona's Lunar and Planetary Laboratory in collaboration with NASA Goddard Space Flight Center and Lockheed Martin Space Systems. The scheduled launch date is in September, 2016. The goal of the mission is to travel to Bennu and return samples from the asteroid. Bennu is a carbon-rich asteroid that may contain the answers to our solar systems origination and history. It will be the first NASA mission to return samples to Earth from an asteroid.

J-Asteroid was customized to support the OSIRIS-REx science team. The team will be using J-Asteroid for planning, commanding and visualization.

Payload: OSIRIS-REx has several instruments on board that will help meet the science objectives, navigation and communication of the mission. J-Asteroid was altered to accommodate the planning and visualization of all the instruments on board the spacecraft. These instruments include: OLA (OSIRIS-REx Laser Altimeter), OCAMS (OSIRIS-REx CAMera Suite), OTES(OSIRIS-REx Thermal Emission Spectrometer), OVIRS(OSIRIS-REx Visible and InfraRed Spectrometer), REXIS(REgolith X-ray Imaging Spectrometer), TAGSAM(Touch-and-go Sample Acquisition), SRC(Sample Return Capsule), GN&C LIDAR(Guidance, Navigation, and Control LIDAR), TAGCAMS(Touch-and-Go Camera System).

Conclusion: J-Asteroid is a visualization and mission planning GIS that was enhanced from the original software suite, JMARS. J-Asteroid allows mission planners the ability to communicate with the payload instruments to create an opportunity for science team members to visualize and process the data.