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SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
New Worlds - Innovative Space Education and Outreach (7)

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DEVELOPMENT OF HANDS-ON INTRODUCTORY PLANETARY DEFENSE COURSE

Abstract

The Aerospace Corporation is a California nonprofit corporation that provides its clients with scientific and engineering support on space and space-related systems. The Corporation's technical staff is in the process of preparing an introductory planetary defense class to explain the unique hazards posed by Near Earth Objects (NEOs) and describe efforts for discovering and tracking NEOs and mitigating their danger. The class begins by reviewing asteroid and comet threat types along with mitigation strategies, and culminates with a hands-on exercise. The exercise uses an interactive NEO deflection simulator developed for NASA by The Aerospace Corporation. The development of the simulator was in response to findings and recommendations from International Academy of Astronautics (IAA) Planetary Defense Conferences highlighting the need to identify NEO deflection options and design and test techniques that might be used to mitigate future collision events. The tool provides the user with insights on how best to deal with an Earth threatening asteroid (NEA) using one or several impacting spacecraft to slightly alter its velocity and put it on a trajectory that misses Earth. The user can select a fictitious, simulated Earth impacting asteroid out of a representative set of objects defined by NASA's Jet Propulsion Laboratory (JPL). By interacting with this on-line tool, the user learns valuable lessons for designing optimal NEA deflection strategies. The web-tool can promote public awareness and preparedness, provide insight into threat and mitigation, increase the general knowledge on the topic and its unique challenges, and aid in finding feasible NEA deflection solutions. The tool will be delivered to NASA in early 2014. It will be added to JPL's public online area and will include detailed documentation. The NEO simulator project was developed as part of the author's Aerospace Systems Architecting and Engineering Certificate Program (ASAECP), a program that was designed to ensure appropriately trained staff to support mission success at The Aerospace Corporation. The author also volunteers in Science, Technology, Engineering and Math (STEM) school outreach activities, where he talks to students about asteroids and space debris, introduces them to the NEO deflection simulator, and inspires them to excel in School, believe in themselves, and make good career choices.