IMPACT! AN ASTEROID'S JOURNEY TO EARTH – INTERACTIVE VISUALIZATIONS FOR MUSEUMS AND CLASSROOMS. J. C. Sacco[1], S. T. Stewart[2], A. Griswold[3], and Z. M. Leinhardt[4]. [1]Harvard Museum of Natural History (26 Oxford St., Cambridge, MA 02138; jsacco@oeb.harvard.edu). [2]Department of Earth and Planetary Sciences, Harvard University (20 Oxford St., Cambridge, MA 02138; sstewart@eps.harvard.edu), [3]Science Media Group, Smithsonian Astrophysical Observatory (60 Garden St. MS-82, Cambridge, MA 02138), [4]Department of Applied Math and Theoretical Physics, Cambridge University (Cambridge, CB3 OWA, U.K.).

Introduction: Collisions are a dominant process shaping the formation and evolution of the solar system. Public interest in impact events is high, but the level of physical understanding is very low. This E/PO project focuses on creating compelling visualizations to articulate physical processes related to impacts in the solar system.

New video and interactive product: We announce the completion of a new educational DVD product, titled *IMPACT! An Asteroid's Journey to Earth.* The video follows the overarching narrative of collisions in the Asteroid Belt leading to meteor impacts on the Earth. The content includes observations of impact craters on planets and asteroids; visualizations of the Asteroid Belt; animations of collisions between asteroids; explanation of resonances in the asteroid belt and perturbation of an asteroid fragment toward Earth; explanation of meteors with high and low impact velocities; explanation and visualizations of the range of outcomes from impacts by meteors with different velocities and sizes. The material complements most museum exhibits and classroom instruction on meteorites.

Museum interactive: The museum product features a modular question and answer (Q&A) video interactive where visitors are able to explore the answers to specific, commonly-asked questions, such as "How common are large impacts?", "How do asteroids reach Earth?", "What is a meteorite?", etc. The interactive also allows visitors to experiment with scientific simulations of asteroid collisions by varying speed and angle of impact and to see the projected outcome of those collisions. The video is on display in the Meteorites exhibit at the Harvard Museum of Natural History (HMNH).

Educational uses: The product presents the current scientific thinking about impact craters and the objects that make them. The content and format of this DVD program was tested with 8th grade students and teachers and extensively revised to create experiences that directly address students' natural questions and concerns, dispel commonly-held misconceptions, and engage them in scientific investigation and analysis. The interactive educators DVD includes the museum product, the option to play the Q&A elements as a continuous 8-minute video, and an expanded asteroid collision simulations and supporting materials section for teachers to use in the classroom. The expanded teacher DVD has been teacher and student tested, revised and approved. In addition to the initial rounds of formative testing with students [1], we returned to review nearly final products with students and teachers last spring and used this information and that of researcher-reviewers to implement final changes.

IMPACT! An Asteroid's Journey to Earth is a flexible teaching and learning tool designed for large class discussions or as part of individual and small group investigations. This programming package includes video presentations and impact simulation activities that, when appropriately integrated into the science curriculum, can help middle and high school educators meet the following National Science Education Standards:

Unifying Concepts and Processes
- evidence, models, and explanation

Physical Science
- properties and changes of properties in matter
- motions and forces
- transfer of energy
- interactions of energy and matter

Earth and Space Science
- structure of the Earth system
- Earth in the solar system
- energy in the Earth system
- origin and evolution of the Earth system

Distribution: Please indicate your interest in receiving a copy of *IMPACT! An Asteroid's Journey to Earth* by sending an email to sstewart@eps.harvard.edu.

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References:

[1] Stewart, S.T., et al. (2006) *LPSC,* Abs. #1991.