ONLINE ACCESS TO THE NEAR IMAGE COLLECTION: A RESOURCE FOR EDUCATORS AND SCIENTISTS. E. J. Speyerer[1] and M. S. Robinson[1], [1]Northwestern University 1850 Campus Drive Evanston, IL 60208.

Background: In 1996 the Near Earth Asteroid Rendezvous (NEAR) Shoemaker spacecraft was launched on a five-year voyage to encounter and study 433 Eros. From February 14th 2000 to February 12th 2001 the NEAR spacecraft orbited the 33x11x11 km asteroid 433 Eros [**1**]. During the yearlong orbital phase of the mission, the NEAR Multi-Spectral Imager (MSI) acquired over 140,000 images of Eros with resolutions ranging from 20 m to about 1 cm per pixel [**2,3**]. To facilitate easy access to this resource we have developed several tools to serve the needs of scientists, educators, and the general public. The NEAR website

– *http://cps.earth.northwestern.edu/near.html*

is aimed at assisting a wide audience ranging from middle school students to research scientists. We have made available four resources: a Geology Field Guide, a large collection of hand laid mosaics, orbital movies, and a multilevel searchable database.

Field Geology Guide: Even though humans have never been to 433 Eros, the NEAR spacecraft transmitted images and other scientific data that allow geologists to unravel the fascinating and complex geology of 433 Eros. Using mosaics and movies processed from MSI images and shape models created from both MSI images and NEAR Laser Rangefinder data, an interactive educational *Field Guide to the Geology of Eros* has been developed to assist the public in understanding discoveries concerning Eros' geology. The *Field Guide* also provides a history of the NEAR Shoemaker mission including significant details regarding its voyage to Eros. The geology section of the *Field Guide* is organized into sections examining broad-scale, intermediate, and small-scale features. The broad-scale section includes a discussion of the overall shape of Eros as well as its three largest craters (all > 5 km diameter), which were most likely were formed as the product of large impacts. The intermediate scale section examines morphologic features such as grooves, ridges, and craters with a diameter less than 5 km. In the final geology section, the significance of small-scale geological features such as boulders, slides, streamers and ponds is highlighted. To assist the user in grasping the location of features on Eros, there is a map linked to point perspective views of Eros with labeled geographic features. Using Virtual Reality Modeling Language (VRML), a user with a VRML enabled browser may rotate the asteroid with their mouse in real time and see Eros with either the surface map or a gravitational slope map of the asteroid projected on the surface. In addition, an interactive non-VRML shape model of Eros with the gravitational slope map of the asteroid projected on the surface is also included in the guide [**4**]. The *Field Guide* also offers an extensive collection of references for further reading about key topics. The guide is intended to serve as a starting point for exploring the website, and thus Eros. It includes the necessary background needed when looking at the movies, mosaics, and the advanced image search to understand the fundamentals of the mission and the MSI images. The pictures and illustrations serve as a great tool for creating excitement about asteroids in the classroom as well as providing a basic foundation for asteroid research.

Mosaics: To assist mapping and locating features on the surface of Eros, hundreds of 2x2, 3x3, and larger mosaic sequences were executed during the orbital phase of the NEAR mission. These mosaics were assembled during the mission to help map the surface of Eros as well as in locating targets for later image sequences. These hand-laid mosaics help serve to unlock the geography and geology of Eros. The Eros landscapes contained in these mosaics provide ready examples for a planetary science curriculum (**Fig. 2**). For example, educators can use the images when exploring how impacts can drastically change the surface and also how the features on Eros can be related to features found on Earth.

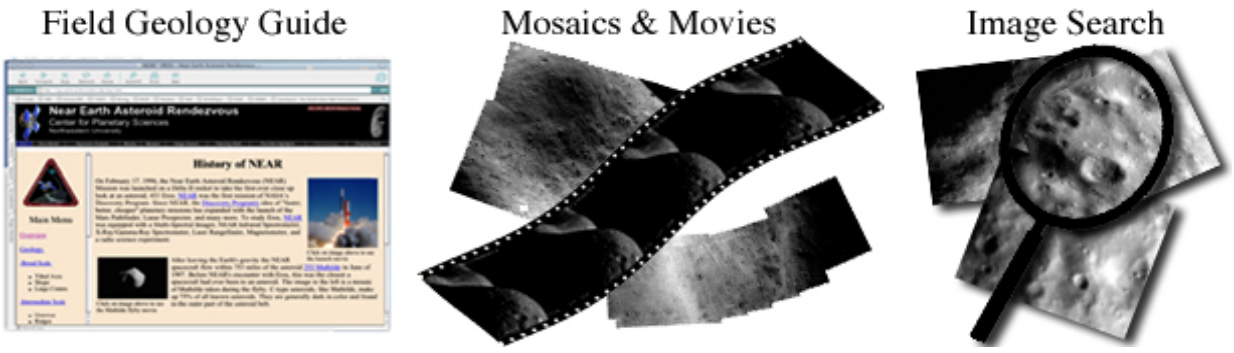

Fig. 1 Resources now available at CPS NEAR website (http://cps.earth.northwestern.edu/near.html)

Movies: Throughout the yearlong orbital phase images were acquired in continuous series. Over 32,000 of these images were later processed into 100 individual orbital movies. During a movie sequence, typically the camera pointing did not move rapidly over the surface, rather the motion of the spacecraft moved the camera's field-of-view across the surface. The images were acquired rapidly with usually less than one minute between the capture of each frame. This fast timing created a large percentage of overlap between frames and thus a steady scan across the surface. Stringing these images together gives the viewer the opportunity to barnstorm an asteroid! Some movies cover time periods up to or greater than one full spin period of Eros (>5 hours) in just a few minutes (**Fig. 3**). These movie sequences have been embedded in the *Field Guide* to illustrate different topics being discussed. The mosaics and movies provide a simple means for a novice user to view and analyze the asteroid's surface.

Advanced Image Search: As the user becomes more familiar with the asteroid and the MSI dataset, there is an advanced image search tool to provide ready access to the MIS images through a searchable database. The advanced image search tool allows you to set criteria to search the 91,769 processed images in the database. The images can be sorted chronologically (mission elapsed time) or by resolution, phase angle, incidence angle, or emission angle. Alternatively, the user can request images best suited for morphological analysis (based on a equation favoring certain incidence and viewing angles). The search results display thumbnails of the images that match the selected criteria. By clicking on the thumbnail image a full resolution version is available as well as links to download the image both in PNG format as well as FITS format (as archived with the NASA Planetary Data System).

Reference: [**1**] Yeomans, D. K. (1995) J. *Astronaut Sci.* 43, 417-426. [**2**] Veverka et al. (2000), *Science*. 289, 2008-2097. [**3**] Veverka et al. (2001), *Nature*. 413, 390-393. [**4**] Thomas et al. (2002), *Icarus*, 155, 18-37.

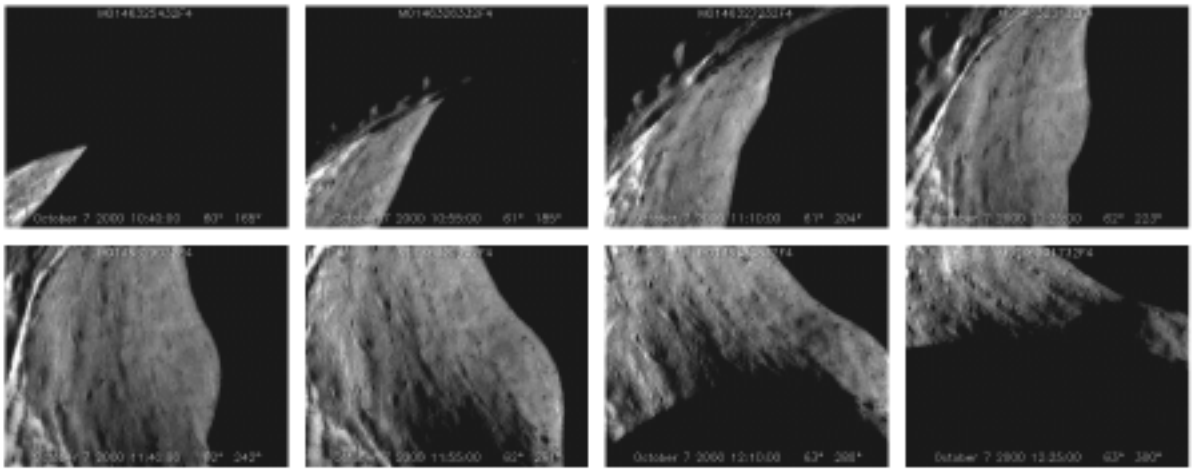

Fig. 3 Thumbnail summary of MSI_FeatureTrack_281 showing a sunset over Himeros.