

THE SPACE IMAGERY CENTER: A NASA REGIONAL PLANETARY IMAGE FACILITY. S. Byrne¹ and M. Schuchardt¹, ¹Lunar and Planetary Laboratory, University of Arizona, Tucson, AZ, USA (shane@lpl.arizona.edu).

Introduction: The Space Imagery Center is one of 9 domestic and 7 foreign NASA Regional Planetary Image Facilities (RPIFs). The center, established in 1977, was the first of these facilities and serves three basic functions: (1) to provide services and materials that aid research in planetary science; (2) to preserve and expand its collection of material and make it accessible to researchers and the public; (3) public engagement activities. Here, we describe a selection of our activities and services that we offer the community.

Information on the Space Imagery Center is available online at: <https://www.lpl.arizona.edu/sic>

1. Aiding Planetary Science Research: Historically RPIFs aided planetary research by making hard copy film and print versions of spacecraft imagery available for inspection. Today most data are available online (although not all – see next section for examples of how we are digitizing remaining analog datasets).

The focus of our RPIF has shifted to provide technical expertise, access to specialized computer hardware and data processing assistance. Over the past several years we have provided ArcGIS enabled computers for community use as well as assistance in locating and processing data to a point where they can be analyzed in a geospatial way.

Recently we have extended these services to include stereogrammetry i.e. the production of digital topography from stereo imagery. Through a series of collaborations, the Space Imagery Center now hosts three new workstations running the cutting-edge commercial stereogrammetry package Socet Set (by BAE systems), each with a 3D monitor and mouse and large digitizing pad (Figure 1). Producing stereo-derived DTMs through Socet Set requires specialized hardware. Each workstation has a Wacom Cintiq 24” touch-screen digitization tablet, Dell UltraSharp 30” Premier Color Monitor, Redover True3Di 24” Stereo3D Display, and a S2-V 3D-Stealth Mouse. The Stereo3D display is the crucial piece of equipment that is too expensive for most individual users to acquire. Facilities, like ours, play an important role in giving researchers access to such equipment at no cost to them.

All of the PDS released HiRISE, CTX, and LROC images, as well as the laser altimeter datasets required for their absolute control, are accessible locally. Each workstation also has a comprehensive suite of software tools for remote sensing applications, including ESRI

ArcGIS, ENVI/IDL, MATLAB, ISIS, Google Earth Pro, and Adobe Creative Suite 6, and Microsoft Office.

Our three workstations are currently in heavy use by regional researchers, students and post-docs, and have also been used for graduate classes offered within University of Arizona.



Figure 1. Three Socet Set workstations are now hosted by the Space Imagery Center and in use for producing digital stereo topography.

Although we now have a modern digital focus, we continue to offer our traditional services to aid researchers examine analog prints within our collection as well as assistance in producing figures and posters.

2. Preserving and archiving data: The Space Imagery Center continues to preserve its archive of prints, film, slides and maps that span fifty years of spacecraft and telescopic observations. We are steadily digitizing and making available those datasets in our possession that are currently in print form only.

Chief among these efforts at the moment is the digitization of the Surveyor Lander camera data. There were five successful Surveyor Lander missions to the Moon in the late 1960s that acquired ~88,000 images of the lunar surface. Only a handful of copies of this dataset still exist and none were digitally available. We have digitized our local copy (which was on 70mm film) along with the available metadata. Figure 2 shows an example of what these data look like. Image metadata was printed directly onto the 70mm film and we are in the process of making these scanned metadata machine-readable. When finished we will archive this dataset in the PDS. This project required the rental of specialized scanning equipment (for which LASER funding was acquired). The support of a facility like

an RPIF makes projects like this feasible and opens up new (or rather old) datasets for community analysis. Figure 2 also has an example of the fruits of this endeavor showing the regolith near Surveyor 5.

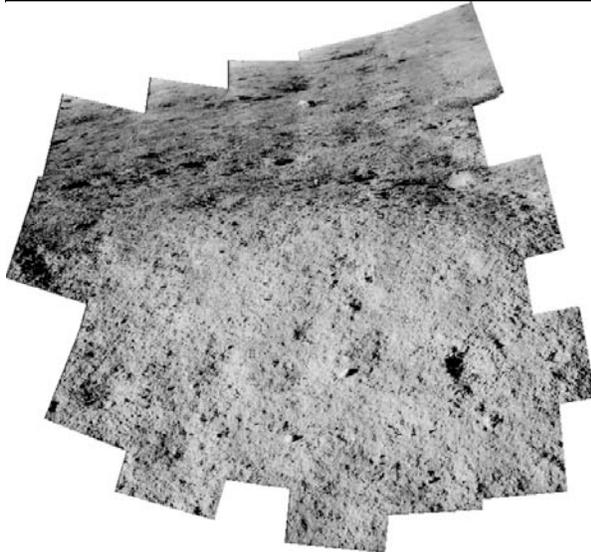
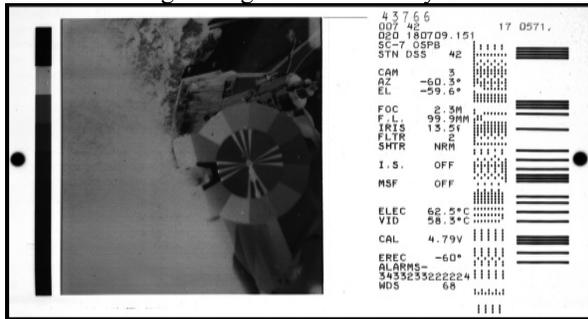


Figure 2. (Top) Typical scanned Surveyor image. Image metadata can be seen right of the frame. (Bottom) Extracted frames mosaicked together showing the regolith near Surveyor 5 (roll 23, frames 512-542).

In addition to the Surveyor project, we have scanned and posted online old lunar atlases, the Communications of the Lunar and Planetary Laboratory (a planetary science journal that ran for several years in the 1960s) and fieldguides to hundreds of planetary analog geology sites throughout the Southwest US.

3. Public engagement activities: The Space Imagery Center's outreach and education activities over the past five years are extensive and include hundreds of events such as classroom visits and demonstrations, hosting visiting school groups, running an evening lecture series for the public, providing material and expertise to UA graduate and undergraduate classes and collaborating with various local entities and events to bring the fruits of NASA's planetary exploration program to the public.

A recent example is our collaboration with the Center for Creative Photograph for their exhibit "Astronomical" (Figure 3). Over 6,000 visitors viewed the images in Images from the collection were on display for six months.

Throughout the year many classroom visits take place, either in the Space Imagery Center or at schools in the area (e.g. Figure 3). There are also various opportunities throughout the year for us to travel to underserved communities to talk about planetary science.

Our annual open house theme is based on recent NASA missions, as well as Apollo celebrations. These events have lectures, children's activities, and exhibits and are well attended, typically with 500 – 700 participants.



Figure 3. (Top) Lunar imaging exhibition in collaboration with the University of Arizona's Creative Photography Center. (Bottom) Example tour of our facility for elementary school children.

Support for the Space Imagery Center: Support for the Space Imagery Center is governed by a Memorandum of understanding between the University of Arizona and NASA. The University of Arizona provides the facilities and salaries of the Data Manager (Schuchardt) and Director (Byrne) while NASA funds its operating expenses. NASA funds have traditionally come through proposals written to the Planetary Geology and Geophysics Program. Future funding sources are unclear.