SPICE Newsletter
March 2011

JAPAN

We first wish to send our condolences to our colleagues in Japan who are struggling with the catastrophe playing out today around Sendai and the greater Tokyo region.

CORE SPICE DEVELOPMENT

NAIF's "work list" for expansion and improvement of the multi-mission SPICE system remains as large as ever. Two major efforts currently underway are completion of the Java Native Interface SPICE Toolkit (JNISpice), and completion of the tessellated shape model–part of the new Digital Shape Kernel (DSK) subsystem. (DSK will eventually also incorporate a digital elevation model capability.) Unfortunately neither of these efforts is close enough to completion for us to reliably predict a release date, but we are hoping to include both in one or two new SPICE Toolkit releases near the end of 2011. (Alpha-test versions of both capabilities are already being used by a number of SPICE users.)

In partnership with NASA/Ames we are experimenting with development of a web-accessible "space geometry calculator." More about this in a future newsletter.

NASA FLIGHT PROJECTS USING SPICE

NAIF's SPICE support for Mars Odyssey, Cassini, Mars Exploration Rovers and Mars Reconnaissance Orbiter continues. The already long flying DAWN mission begins its exploration of asteroid Vesta in July. The Applied Physics Lab continues its SPICE support for MESSENGER and New Horizons.

NAIF's SPICE support for EPOXI and Stardust/NExT is about done; soon NAIF will produce official archives.

The NAIF Team is busy organizing SPICE flight support for several new missions: Juno, Mars Science Laboratory and Grail all are scheduled for launch later this year. Ames' Lunar Atmosphere and Dust Explorer mission (LADEE), launching in 2012, is expected to use SPICE, as will GSFC's Mars Atmosphere and Volatile Evolution Mission (MAVEN), launching in 2013.

SPICE will also be used on the Soil Moisture Active and Passive (SMAP) earth science mission, scheduled for launch in 2014. Portions of SPICE are being or will be used on a variety of additional (non-planetary) missions.

INTERNATIONAL FLIGHT PROJECTS USING SPICE
SPICE operations on ESA's Mars Express, Venus Express and Rosetta missions continues, centered at the European Space Astronomy Center (ESAC) in Spain. Under a NASA Participating Scientist program NAIF is helping the Russian Space Agency to deploy SPICE in support of the Phobos Sample Return mission. Under a similar program NAIF was about to help JAXA with SPICE deployment and training in support of the Venus Climate Orbiter (Akatsuki) mission, which unfortunately did not achieve Venus orbit insertion. (We hope to provide such support a few years from now when a second try at VOI may be possible.)

FUTURE FLIGHT PROJECTS USING SPICE
A variety of solar system exploration flight projects are under consideration for future implementation by various space agencies. Budget pressures on all of these agencies makes the future a little murky at present, but NAIF hopes to help with future deployment of SPICE wherever there is interest.

SPICE ARCHIVES
SPICE data generated by NASA's planetary missions are being regularly archived at the NAIF Node of the Planetary Data System (http://naif.jpl.nasa.gov/naif/data_pds_archived.html). (Through prior arrangement NAIF is also mirroring ESA's MEX, VEX and ROSETTA SPICE archives.) The other space agencies that are using SPICE have created (or likely will create) their own SPICE archives and data distribution systems.

NASA's Planetary Data System is working now to design the next generation archive system, called PDS4. Once those standards have been set NAIF plans to migrate all of its SPICE archives to the PDS4 standards/system. This will NOT change any of the kernel formats or contents, and thus will not affect how you use SPICE data. The change will result in a few changes to the meta-data used in cataloging archived SPICE data, and will also result in changes/improvements for accessing archived SPICE data through the PDS' central catalog system. (Access to SPICE data directly from the NAIF website will not change.)

SPICE TRAINING
As the number of SPICE users increases, and as SPICE capabilities grow, offering SPICE training seems an important piece of NAIF's work. NAIF's current offering is a single, one-size-fits-all class. NAIF has come to realize–in part based on feedback from students–that this approach must change. In the future we plan to offer two official classes–one for "beginners" and a second for advanced users, covering advanced topics. (We must also offer training for both mission SPICE producers and for mission SPICE archive generators; this will happen in informal, one-on-one or few-with-a-few settings.)

We hope to offer our next domestic class sometime during "summer 2011" and hope to pick specific dates shortly. This class will again be in the Pasadena California region. Unfortunately we will not be able to restructure the current

"one-size" class syllabus very much, but we will likely shorten this class somewhat by restricting it to the most basic topics. Then we'll try to host a new, advanced class later on.

In past years we have managed to work out arrangements to host SPICE classes at several locations outside of the U.S., sometimes using NASA funding and sometimes using host country funding. At this moment it's not clear what may be the interest in "external" classes, and how the travel expenses would be covered.

NAIF is interested to hear anyone's thoughts on SPICE training: what kind, when and where. Send any suggestions/requests to charles.acton@jpl.nasa.gov.

<u>PROGRAMMATICS</u>
The recently released NSF/NASA-sponsored National Research Council's DECADAL Report on solar system exploration (http://solarsystem.nasa.gov/multimedia/download-detail.cfm?DL_ID=742 , page 314) contains an endorsement for continued use of SPICE on NASA's planetary missions.

The International Planetary Data Alliance (IPDA) (http://planetarydata.org/) currently "recommends use of SPICE for ancillary data."

Despite budget challenges and overall economic uncertainty, NASA has recently confirmed its financial commitment to NAIF.

<u>YOUR SUGGESTIONS?</u>
Should you have suggestions for improving NAIF operations or the SPICE system, we're interested in hearing of these. (charles.acton@jpl.nasa.gov)