SPICE Newsletter

Getting Along During "Stay-at-home"

As best we know NAIF operations have been continuing with little interruption. If you believe you've discovered otherwise, please inform one of the NAIF team members right away.

NASA Questionnaire for PDS Users

NASA's Planetary Science Division has posted a questionnaire looking for feedback on all elements of the Planetary Data System, of which NAIF is one. Should you wish to provide anonymous feedback on your experience using the SPICE system or the NAIF Node of the PDS, or any other part of the PDS, you could do so here:

https://www.surveygizmo.com/s3/5308511/

The survey will remain open until the end of April. It seems a bit clunky, but using it could be helpful to NASA management, and ultimately to you.

WebGeocalc On-line Geometry Engine

https://wgc.jpl.nasa.gov:8443/webgeocalc/#NewCalculation

With the help of one of our contractors, ODC Space, work on the WebGeocalc tool continues. NAIF is announcing the availability of version (2.2.0) of WebGeocalc, a web browser-based interface to a SPICE geometry engine. This is a minor update that includes:

* Extension of GUI and API State Vector calculations to allow specifying target and observer as points, fixed or moving with constant Cartesian velocity
* Addition of the default response from the API when it is called with the root URL
* Updates to make WGC compliant with Section 508 accessibility requirements

If you are contemplating using WebGeocalc, be sure to read the "About the Data" text available from a link at the top of the WebGeocalc home page.

https://naif.jpl.nasa.gov/naif/WGC_about_the_data_r3.html

Pay particular attention to the red text in the section titled "Using Named Kernel Set Selection"; this addresses the time coverage of the SPICE data. Trying to make a computation outside of the available time coverage is the most common user problem.

Some partner space agencies may offer their own instances of WebGeocalc. Be sure to read about their local setup of this service as it will likely differ from NAIF's offering.

If you're unfamiliar with WebGeocalc and would like to learn more about it, visit this webpage: https://naif.jpl.nasa.gov/naif/webgeocalc.html

Cosmographia 3-D Mission Visualization Tool
With the help of one of our contractors, Fifth Star Labs (the original author of Cosmographia), work on adding new features continues. A new version is expected to be available fairly soon and when ready will be announced using the "spice_announce" notification system.
https://naif.jpl.nasa.gov/naif/cosmographia.html . Among the new features will be these:
   o Ability to load 3D shape data directly from a SPICE DSK file;
   o Ability to globally change the text size used for labels, messages, annotations, etc. using a few preset font sizes
   o Additional scripting functions including waiting based on simulation time, moving to a point-of-view in a SPICE frame, and setting the scene using a URL

SPICE for CubeSats, SmallSats and Lunar Gateway
NAIF had hoped to present/discuss SPICE at three upcoming CubeSat conferences, but all three have been cancelled. Possibly some SPICE materials will eventually be available in virtual versions of two of those conferences:
https://www.cubesat.org/workshop-information
http://www.intersmallsatconference.com/

It could be useful for NAIF to know which cubesats are planning on using SPICE, and for those that will do so, which will hope to get some NAIF support. Providing a brief summary of how your cubesat project will use SPICE would also be helpful.

Just before the Corona-19 shutdown of JPL, NAIF had acquired a Raspberry Pi in order to test the SPICE Toolkit on this platform. Unfortunately we were not able to do this work.

SPICE was not designed for on-board use, so we urge anyone embarking on this sort of application to be very careful in doing so, including doing extensive testing.

NAIF is trying to inform the Lunar Gateway program about possible uses of SPICE in support of lunar (orbital and landed) and solar system science investigations.

SPICE Training
In the current COVID-19 situation it is far from clear when NAIF will again be able to host a traditional in-person SPICE training class; probably not for many months or even longer. What alternatives exist?

The notion of presenting a class over WebEx or Zoom or something similar has been floated, but it's not clear how the best part of the training–the student-executed programming lessons–could be handled in this environment. In our live classes we typically have multiple instructors providing one-on-one or one-on-two consulting. Often the instructor actually uses the student's computer to help sort out the problem at hand. If any of you have suggestions about doing virtual training, we'd be interested in hearing from you.

Probably the best choice for SPICE training at present is the self-training package consisting of the tutorials and programming lessons used in the "live" classes.
https://naif.jpl.nasa.gov/naif/self_training.html
We note that the programming lessons in this package are truly "open book" in that the answers–our solution code and the resulting numeric answers–appear on the "next page" after each problem.

If you have some virtually near-by colleagues who are familiar with SPICE, perhaps you could use a shared WebEx screen with one of them who could help with any problems that arise as you go through the programming lessons. In any case, be sure to make use of the SPICE tutorials named "33_common_problems" and "35_summary_of_key_points" found here:
https://naif.jpl.nasa.gov/naif/tutorials.html

Also look at the resources available from our "Getting Help" webpage:
https://naif.jpl.nasa.gov/naif/gettinghelp.html

Finally, make use of NAIF's "Common Problems" required reading document. It's included in every Toolkit, in both plain text and html formats. It's also available from the NAIF website, for instance here:
https://naif.jpl.nasa.gov/pub/naif/toolkit_docs/C/req/problems.html
for the C-language version. Look under here: https://naif.jpl.nasa.gov/naif/documentation.html to find versions for the other NAIF-supported languages.

Leapseconds Kernel
The International Earth Rotation Service announced there will **NOT** be a new leap second declared at midnight on July 01, 2020. As a consequence, the current SPICE leap seconds kernel, naif0012.tls or naif0012.tls.pc, will remain current until at least January 01, 2021.

Other Users and Uses
NAIF is always interested to hear about projects and other uses of SPICE that are likely outside of our knowledge base (https://naif.jpl.nasa.gov/naif/SPICE_Users.pdf). Send a quick note to a member of the NAIF Team.

SPICE Announcements and SPICE Discussion
If you haven't already done so, consider signing up to the "spice_announce" Mailman system to receive the occasional announcements about new Toolkits, new generic kernels, new or changed services, bugs, training, etc. https://naif.jpl.nasa.gov/mailman/listinfo/spice_announce. We use this rather sparingly to avoid spamming you.

Rather more frequently, announcements are also placed on NAIF's "Announcements" webpage. The date a new announcement has been placed there is shown at the top of the NAIF home page.

You could sign up to the "spice_discussion" Mailman system to exchange SPICE-related questions, offerings or ideas with other SPICE users. https://naif.jpl.nasa.gov/mailman/listinfo/spice_discussion

Getting Help
Perhaps your problem is already addressed on the NAIF website:
https://naif.jpl.nasa.gov/naif/gettinghelp.html

or in the "Backup" pages of a relevant [SPICE tutorial](#) (most particularly SPK and CK), or in the "common_problems" tutorial.

If you have a SPICE question best answered by someone at NAIF, please send email to just one of the NAIF Team members: https://naif.jpl.nasa.gov/naif/contactinfo.html. Your question will be forwarded to whomever can best answer it.

European SPICE users might wish to email the ESA SPICE team: esa_spice@sciops.esa.int
Japanese SPICE users might wish to email the JAXA SPICE team: darts-admin@ml.isas.jaxa.jp