Announcement of the Cosmographia Mission Visualization Software

27 March 2015

Dear Colleagues,

The Navigation and Ancillary Information Facility (NAIF) at JPL is pleased to announce the availability of an extended version of a visualization tool named Cosmographia. This tool may be used to create animations of the observation geometry available via traditional SPICE data files, such as planet orbits, spacecraft trajectory, spacecraft orientation, instrument field-of-view "cones" and instrument footprints.

The special power of the NAIF-extended version of Cosmographia is that it can make use of all[1] SPICE kernel types to accurately model the observation geometry of planetary missions for which substantial or complete sets of SPICE data are available. Cosmographia has many user controls allowing one to manage what is seen and what vantage point to use.

Cosmographia is a downloadable tool, not a web application; you must download and install the appropriate binary on your computer. The download site is given below. Executable binaries have been prepared on Mac OS, Windows and Linux. These executables work on modern versions of the named operating systems, and perhaps on some older versions as well. However, NAIF is not able to assist in solving compatibility problems.

To run Cosmographia using SPICE data you will need to have the appropriate SPICE kernels (data files) on your computer, and you'll need to construct–or be given–a set of JSON files used to communicate to Cosmographia which SPICE files to use and how to use them. NAIF has prepared a User's Guide for constructing these types of JSON files, and also provides some templates to use as starting points. The Cosmographia installers include generic SPICE ephemerides for the planets, their satellites, and a few asteroids.

The NAIF-extended version of Cosmographia is free to all persons and commercial entities, subject to the license provisions attached below and provided with the distribution packages. The same rules that apply for getting help from NAIF regarding SPICE apply to Cosmographia. See "Getting Help from NAIF" here: http://naif.jpl.nasa.gov/naif/rules.html.

Cosmographia is one of a number of visualization tools developed within the planetary science community, some of which use SPICE to some degree, and some of which are available to interested parties. Names of some of these tools may be found here: http://naif.jpl.nasa.gov/naif/SPICE_aware_Tools_List.pdf. NAIF has elected to focus on Cosmographia for a number of reasons, including its full use of SPICE kernel types and our ability to freely distribute it. Those interested in geometry visualization capabilities must make their own determinations about which tool(s) to use.

Access to the Cosmographia binaries, the Cosmographia-SPICE Users Guide describing how to prepare JSON files needed to supply SPICE data to Cosmographia, and some allied JSON templates are available from the NAIF server from this web page:

http://naif.jpl.nasa.gov/naif/cosmographia.html

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[1] Not yet including the "new" Digital Shape Kernel (DSK) subsystem

The original Cosmographia program (see below) has been developed by Chris Laurel as an Open Source project. The NAIF-extended version of Cosmographia is a work in progress. Its capabilities and interfaces are being frequently revised and are subject to change without notice. Potential users of this software should carefully consider these circumstances before embarking on use of the tool. Should you have any questions in this regard, contact the NAIF Manager: Charles.Acton (at) jpl.nasa.gov. Also read the disclaimer below.

---------------------------------- Credits -----------------------------

The NAIF version of Cosmographia is an extension of the open source Cosmographia application developed by Chris Laurel of Fifth Star Labs LLC:
https://code.google.com/p/cosmographia/ and
https://itunes.apple.com/us/app/cosmographia/id519714038?mt=8.

NAIF is pleased that Chris has agreed to allow NAIF to release the extended version of his program.

For rendering, Cosmographia uses the open source VESTA library from Astos Solutions: http://www.astos.de/products/vesta. NAIF thanks Astos Solutions for permission to use the VESTA library in the JPL-extended version of Cosmographia.

The User's Guide and templates for preparing JSON files used to connect SPICE data to Cosmographia were prepared by summer students Michelle Park and Farhan Alam, with updates by Boris Semenov and Charles Acton.

Eric Ferguson, Drew Hall, Eric Castello, supported by the NAIF Team, have developed the JPL extensions to Cosmographia.

The SPICE format generic planet, satellite and asteroid ephemerides are produced by JPL's Solar System Dynamics Group.

SPICE format planet, satellite and asteroid size, shape and orientation data are taken from the "Report of the IAU Working Group on Cartographic Coordinates and Rotational Elements: 2009."

NAIF Team members Nathaniel Bachman, Boris Semenov and Edward Wright, and their predecessors, developed the SPICE system components used extensively within this version of Cosmographia. Charles Acton is the NAIF manager.

SPICE development occurs under the auspices of the Planetary Data System program of NASA's Planetary Science Division, for which William Knopf is the NASA Program Executive, Michael New is the Program Scientist and Thomas Morgan is the Project Manager.

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