



## Supported Languages

- Fortran 77
- C
- IDL
- MATLAB
- Java Native Interface
- Python

## Supported Environments

- PC/Linux
- Mac/OSX
- PC/Windows

## Archives

- SPICE data are professionally archived at each user agency's archive center

## Key Characteristics

- Highly tested, well documented source code is provided
- Used throughout NASA and by most major space agencies worldwide
- Products are not restricted under U.S. ITAR and EAR
- Freely available to everyone!

## For more information:

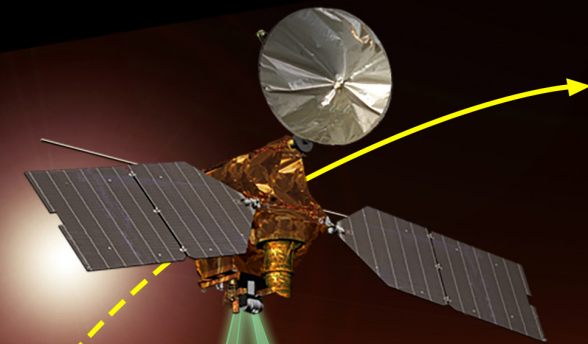
<https://naif.jpl.nasa.gov>

## Rules of use:

<https://naif.jpl.nasa.gov/naif/rules.html>

# SPICE

NASA's Science Observation  
Geometry System



The research was carried out at the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

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National Aeronautics and Space Administration

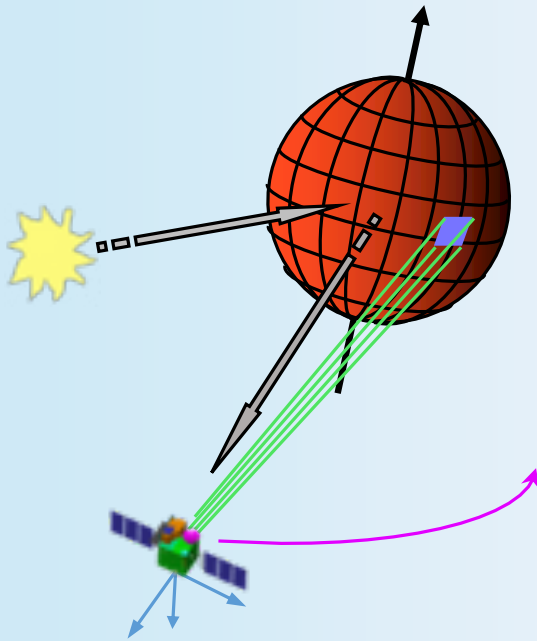
**Jet Propulsion Laboratory**  
California Institute of Technology  
Pasadena, California

[www.nasa.gov](http://www.nasa.gov)

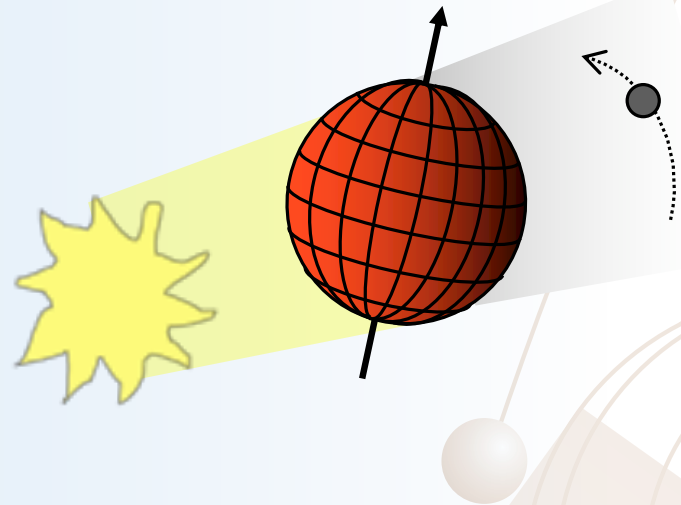
CL# 18-4700  
JPL 400-1690 08/18

Developed and maintained by the Navigation  
and Ancillary Information Facility located at  
Caltech/Jet Propulsion Laboratory

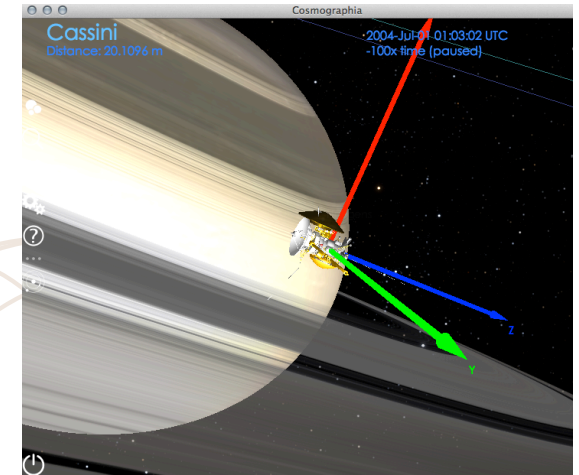
**Calculation example:**  
Compute positions and velocities



**Calculation example:**  
Find times of occultations



**Visualization example:**  
Depict Cassini at Saturn



### SPICE\* Components

- Data files ("kernels")
- Software modules
- Documentation
- Tutorials
- Programming lessons
- Training classes
- Expert consultation

### Uses of SPICE

- Mission design
- Mission engineering
- Observation planning
- Science data analysis
- Mission visualization
- Outreach

### Ways to use SPICE

- Write a program that incorporates a few SPICE Toolkit modules
- Utilize the SPICE geometry engine hosted by NAIF or another agency
- Download and run the SPICE-Enhanced Cosmographia 3-D visualization program

\***S**pacecraft, **P**lanet, **I**nstrument, **C**amera-matrix, **E**vents