Remote Sensing
Programming Lesson
(Cassini)
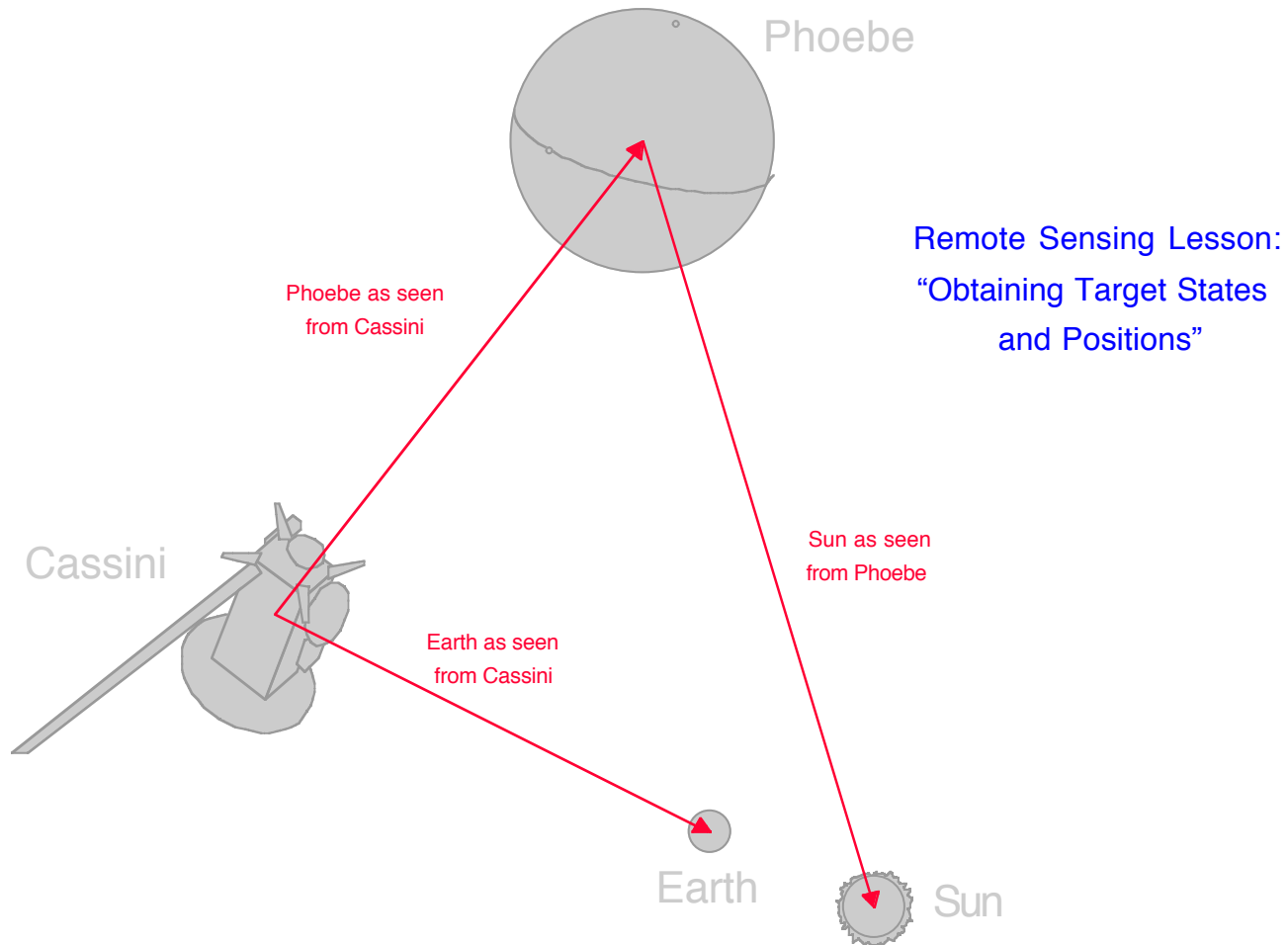
October 2022
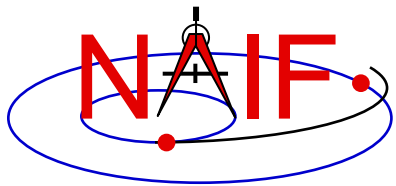
Navigation and Ancillary Information Facility

Phoebe

Cassini

Earth

Sun

Phoebe as seen
from Cassini

Earth as seen
from Cassini

Sun as seen
from Phoebe

Remote Sensing Lesson:
"Obtaining Target States
and Positions"

IAU_PHOEBE
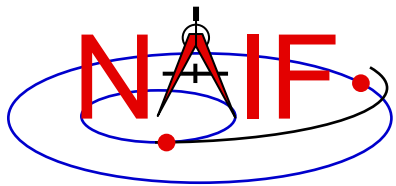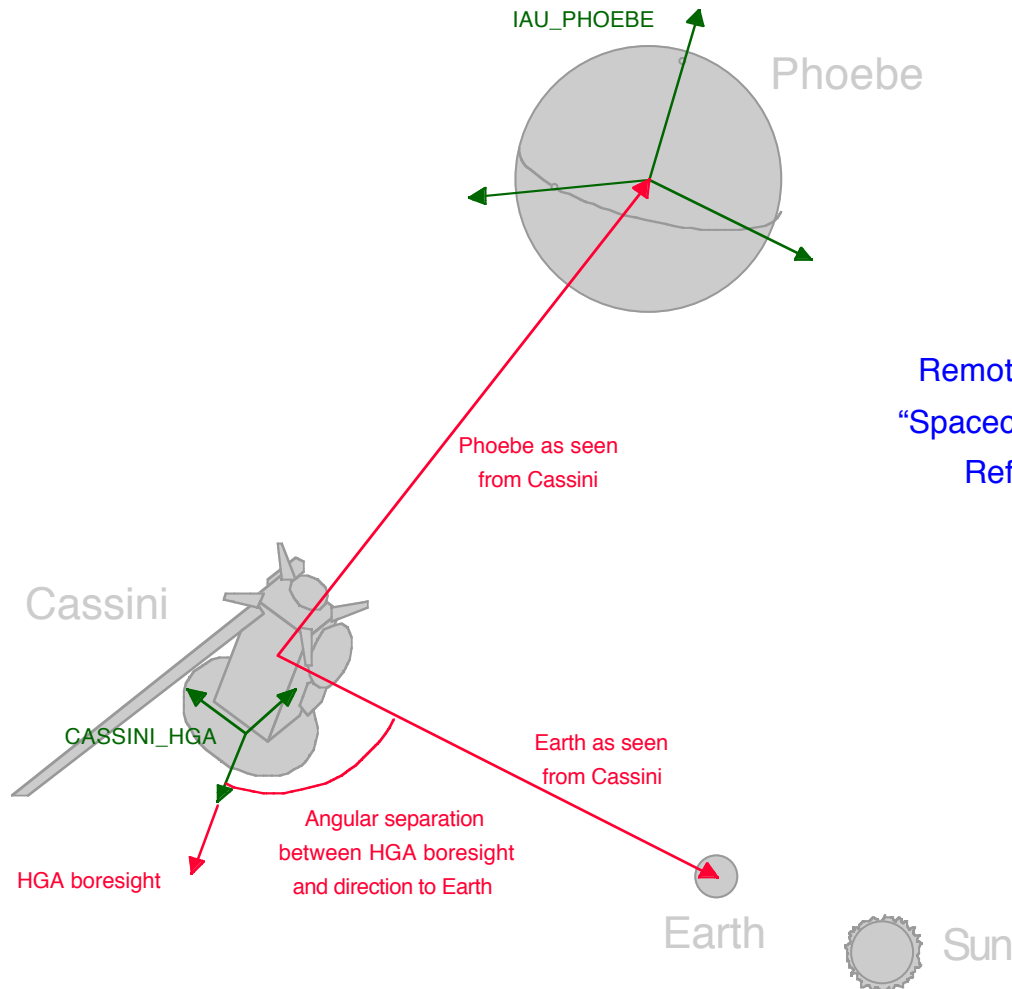
Phoebe

Remote Sensing Lesson:
"Spacecraft Orientation and
Reference Frames"

Phoebe as seen
from Cassini

Cassini

CASSINI_HGA

Earth as seen
from Cassini

HGA boresight

Angular separation
between HGA boresight
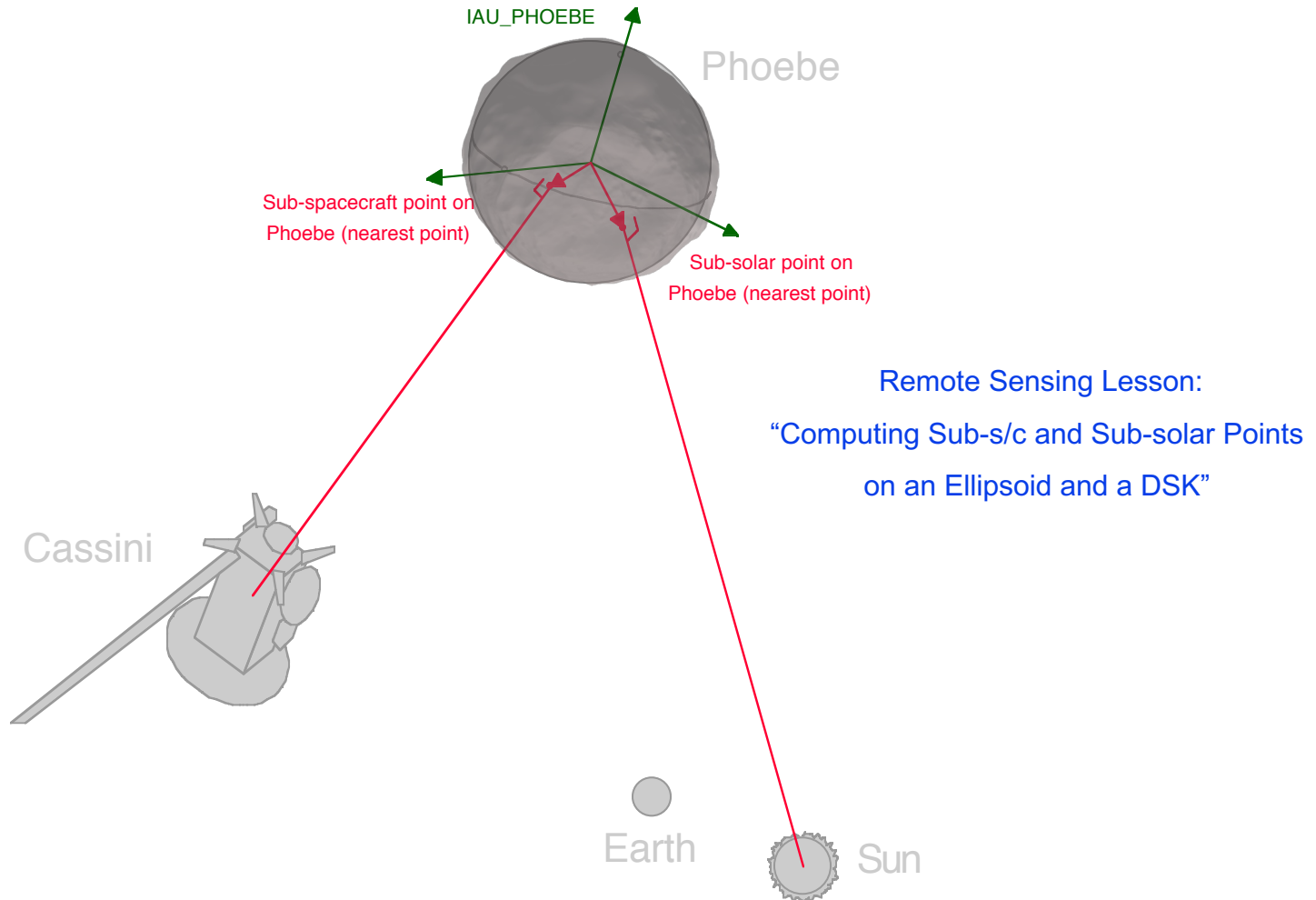and direction to Earth

Earth

Sun

3

Phoebe Shape

The next two tasks ask for computing observation geometry parameters for Phoebe modeled as a triaxial ellipsoid and as a triangular plate model provided in a DSK, resulting in significantly different values for these two cases. This should not be surprising given how different Phoebe's shape is from an ellipsoid, as illustrated by the animation/view below.
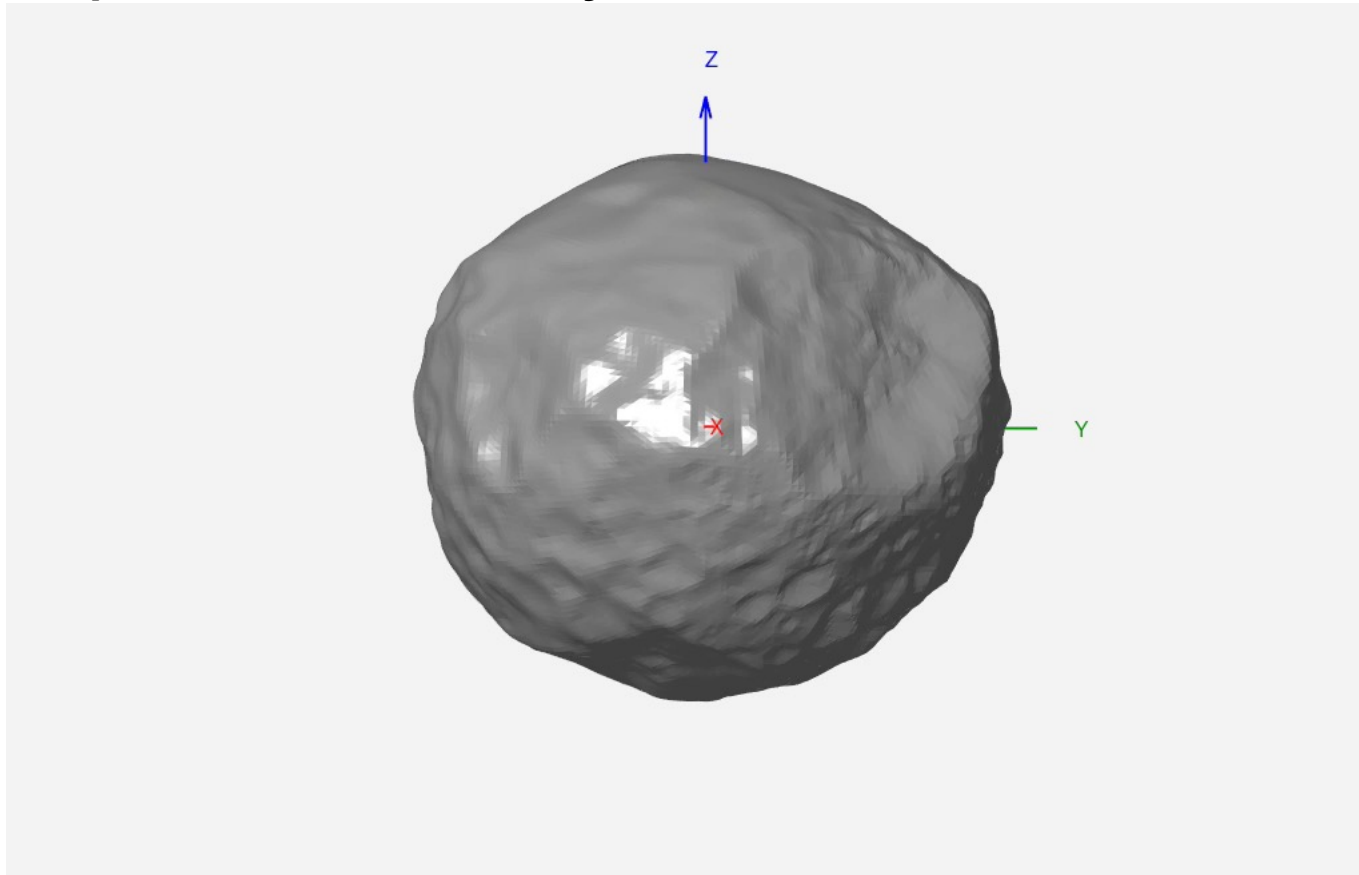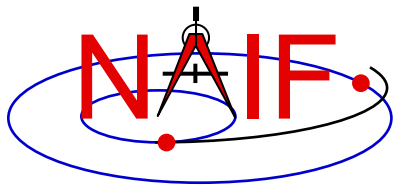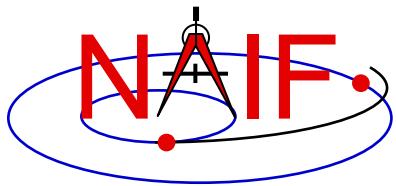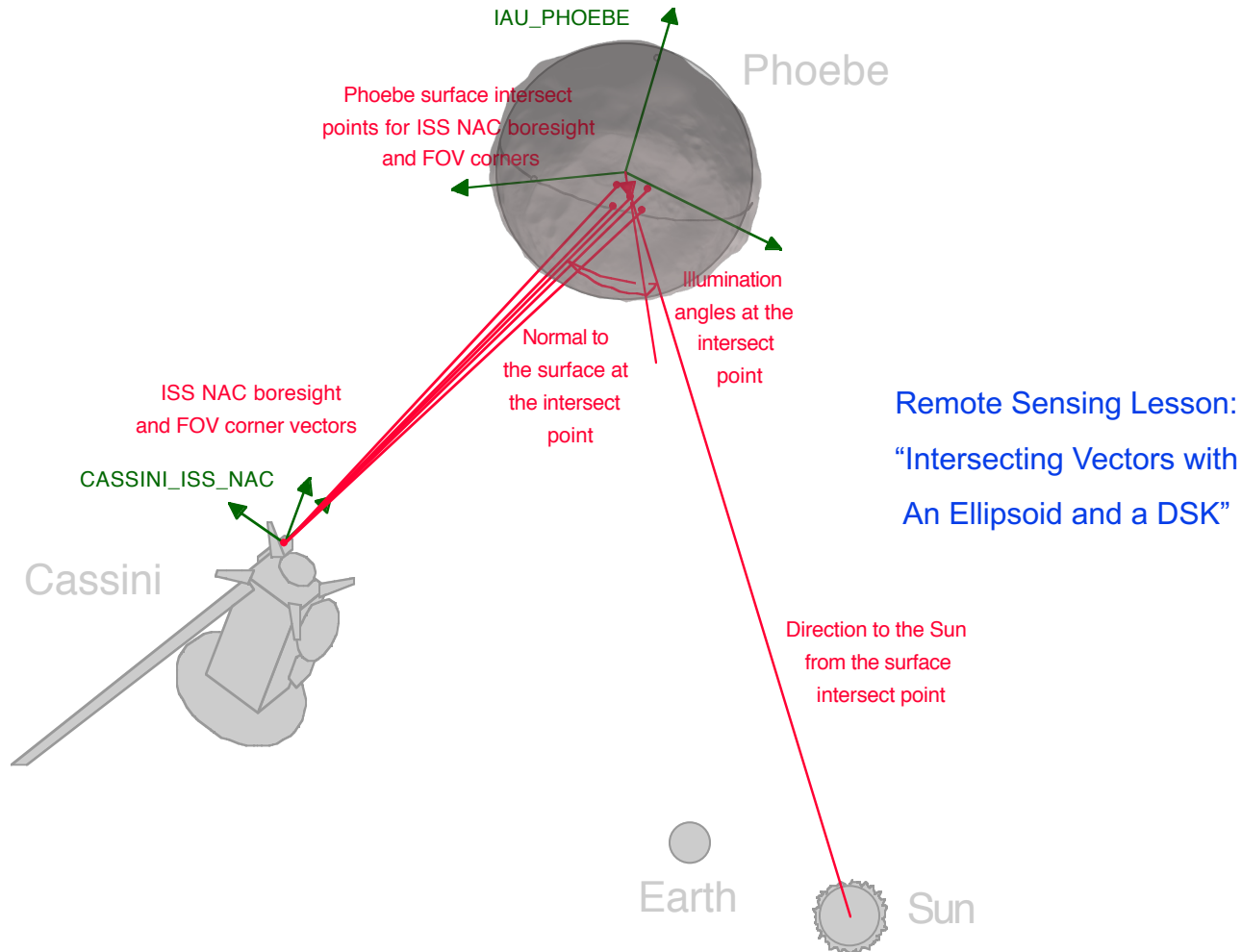
IAU_PHOEBE

Phoebe

Sub-spacecraft point on
Phoebe (nearest point)

Sub-solar point on
Phoebe (nearest point)

Remote Sensing Lesson:

"Computing Sub-s/c and Sub-solar Points

on an Ellipsoid and a DSK"

Cassini

Earth   Sun

Navigation and Ancillary Information Facility

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Phoebe

Phoebe surface intersect
points for ISS NAC boresight
and FOV corners

Illumination
angles at the
intersect
point

Normal to
the surface at
the intersect
point

ISS NAC boresight
and FOV corner vectors

CASSINI_ISS_NAC

Remote Sensing Lesson:
"Intersecting Vectors with
An Ellipsoid and a DSK"

Cassini

Direction to the Sun
from the surface
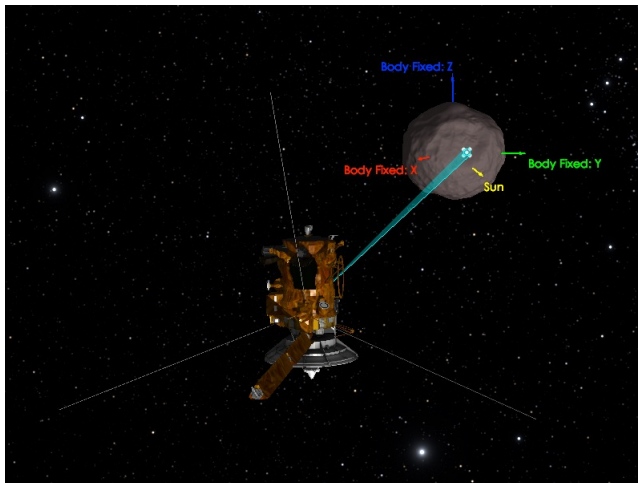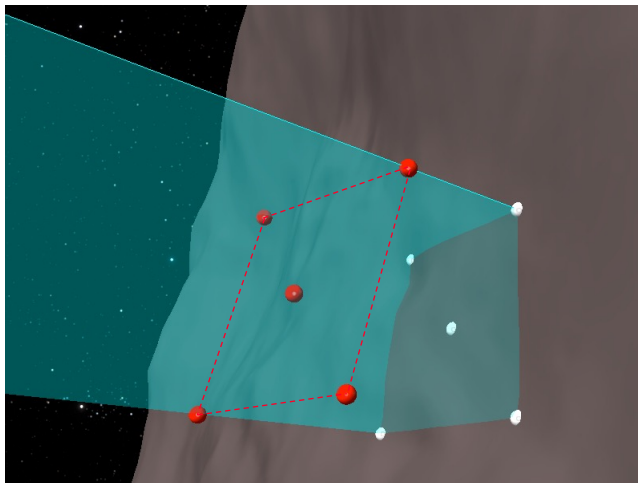intersect point

Earth

Sun
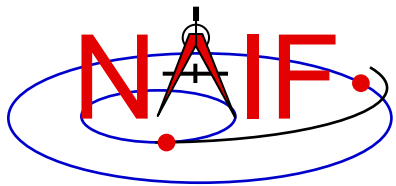
"fovint" Cosmographia Views

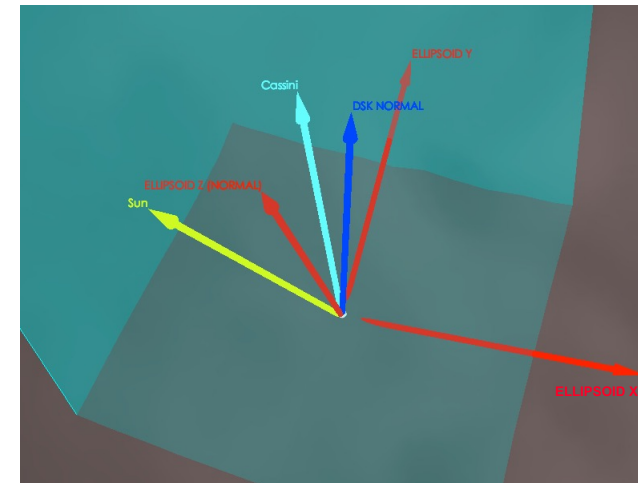**Navigation and Ancillary Information Facility**

The "big" picture

Ellipsoid (red) and DSK (white) intercept points

Principal directions at the boresight DSK intercept point (top view)

Principal directions at the boresight DSK intercept point (side view)