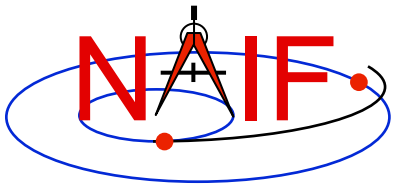


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# **Geometric Event Finding Programming Lesson (TGO)**

**May 2018**



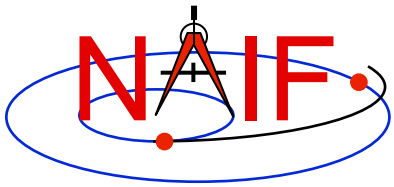
# Geometric Event Finding: Overview

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- **Problem statement:**

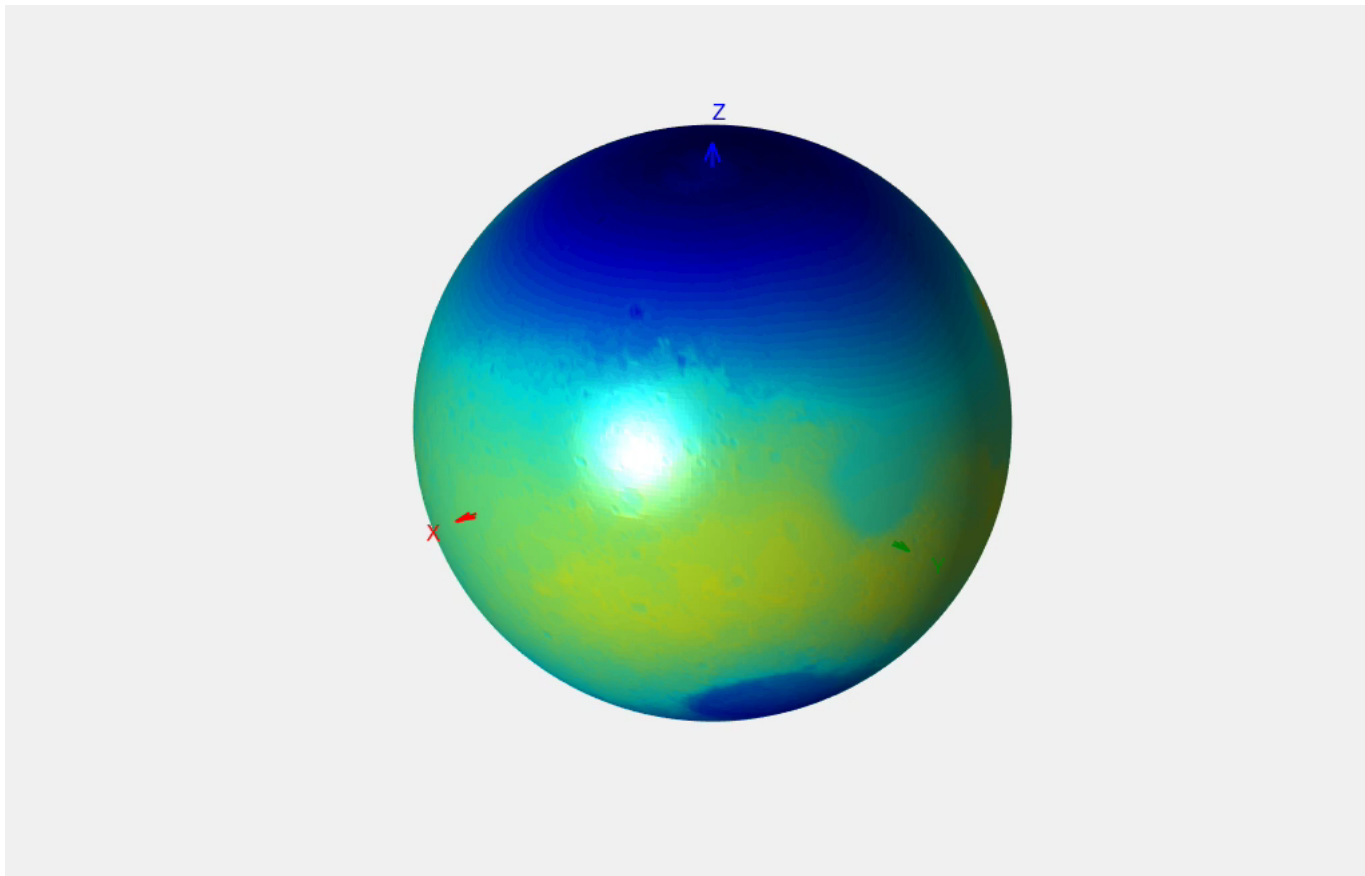
- Determine when the ExoMars-16 Trace Gas Orbiter (TGO) is visible from ESA's New Norcia station, within the time interval  
2018 Jun 10 TDB  
2018 Jun 14 TDB
- For the spacecraft to be considered visible, the apparent spacecraft position relative to New Norcia station must have elevation of at least 6 degrees in the station's topocentric reference frame NEW\_NORCIA\_TOPO.
  - » Use light time and stellar aberration corrections to compute the spacecraft position relative to New Norcia.
- Account for possible occultation of the spacecraft by Mars, using an ellipsoidal shape model and a DSK shape model.
- Compute a SPICE window representing the visibility period.
- Display the start and stop times of each time interval in this SPICE window.

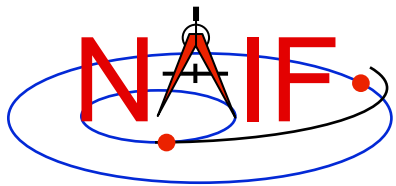


# Mars Shape

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**Spacecraft occultation ingress and egress times computed for Mars modeled as a triaxial ellipsoid and as a triangular plate model provided in a DSK differ noticeably due to the Mars topography differing from the ellipsoidal surface for some areas by many kilometers, as illustrated by the animation/view below.**





# Visibility Geometry

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