

NASA Eyes Visualization Tool and the 2017 Solar Eclipse

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1. Introduction

The total solar eclipse on 21 August 2017 will provide exciting opportunities for solar radio observers in North America; for example, see [ReeveVLF], [ReeveVHF] and [ThiemanHF]. The sooner you start planning and preparing the better will be your chance for success. Part of planning for the eclipse involves visualizing what will happen. The NASA Eyes Visualization software tool produced by the Jet Propulsion Laboratory has an *Eclipse 2017* module that is very handy for this purpose. The tool has a lot of other features but this paper will quickly get you going with the eclipse module.

2. Get Started

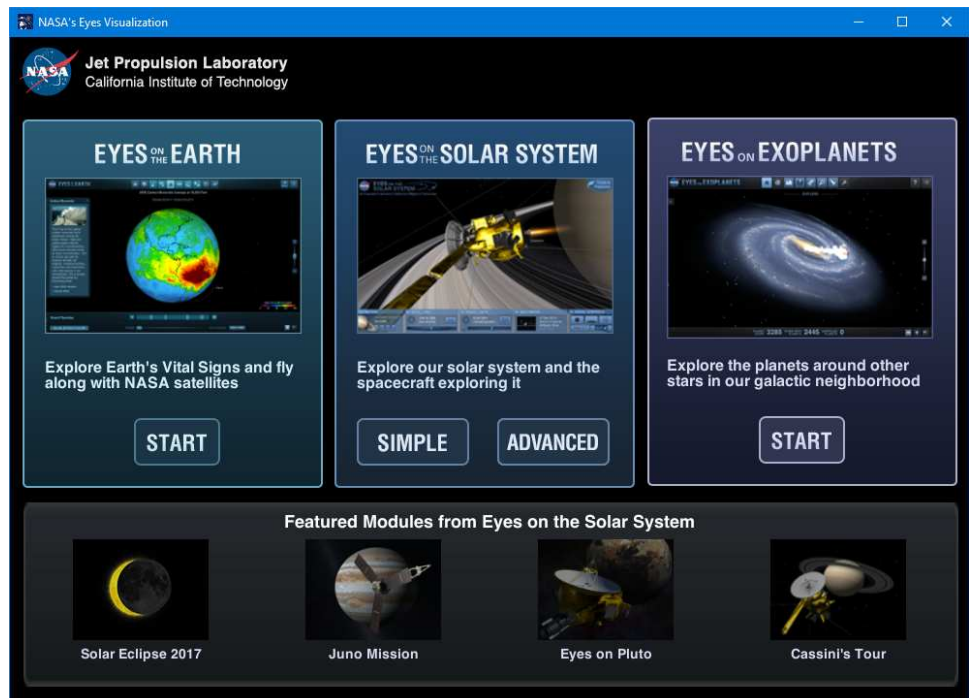
NASA Eyes is available for the Windows PC, Mac and mobile devices, but the information below applies to a Windows PC. Go to {[NASA Eyes](#)}, click **Download App** and install the software using the normal procedures for your system. If you press **Launch** instead of Download App, the program will temporarily load on your system but will disappear when you exit.

The installation places a shortcut on the Desktop. Click it to start NASA Eyes. As the program opens, it automatically checks for and installs updates.



After a few moments the **Main** control panel window opens as seen in the image right.

Click the Advanced button in the middle panel titled **EYES on the SOLAR SYSTEM**. Alternately, click on the **Solar Eclipse 2017** button in the lower-left corner of the **Main** window.



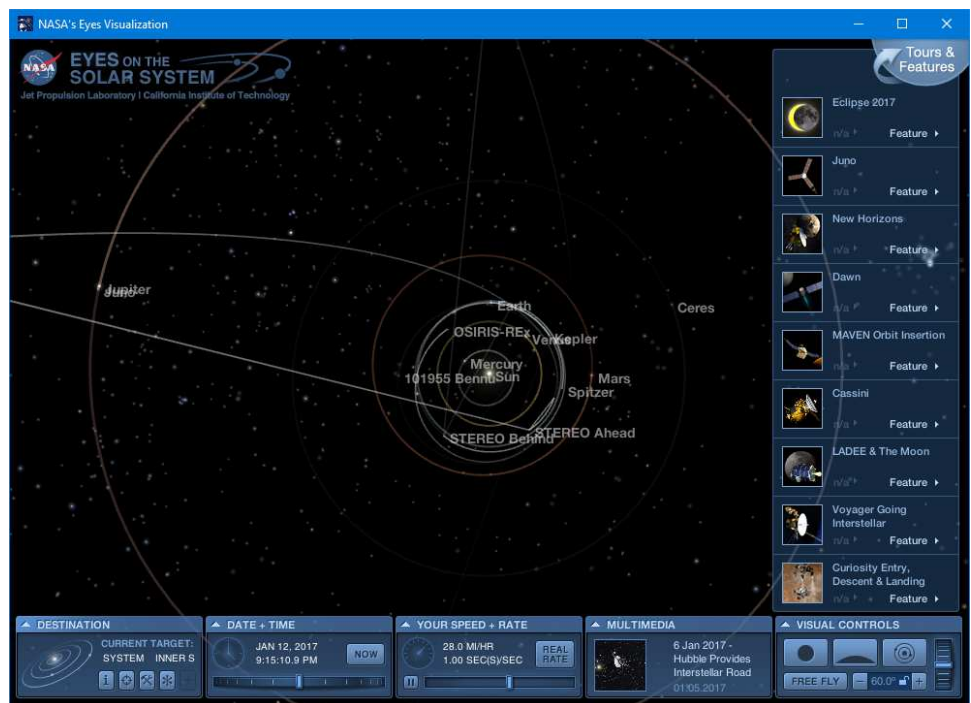
If you clicked the Advanced button in the **EYES on the SOLAR SYSTEM**, a new window opens that shows the solar system from above. This screen is skipped if you clicked the **Solar Eclipse 2017** button instead.

At this point you can switch to Full Screen mode as indicated by the text that appears adjacent to the Full Screen icon in the small control panel in the lower-right corner of the window.



Once in Full Screen mode, click the **Tours & Features** tab in the upper-right corner. A dropdown menu will appear.

Click on the eclipsed Sun image in the **Eclipse 2017** menu item. This will take you to the eclipse module window.

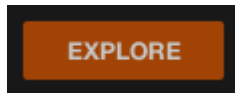


This window opens from either the **Main** window or **Eyes on the Solar System** window.

If not already in the Full Screen mode, click the icon in the lower-right corner.



Now, click the **Explore** button at the bottom of the window.



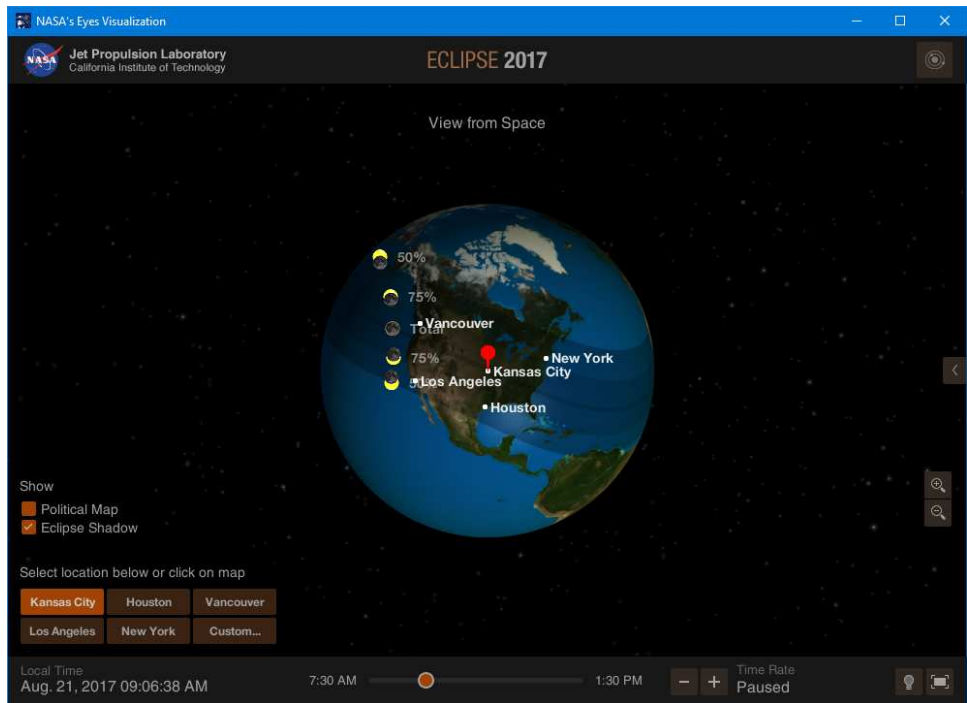
A window opens with two panels that show Earth's North America on the left and the Sun on the right. Now you are ready to explore using the many controls in the panels.

Expand the Earth panel by clicking the right-pointing arrow in the middle between the two panels.

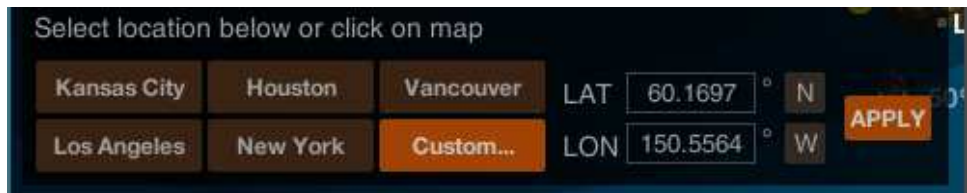


3. Using the Earth Panel

In the lower-left of the Earth panel are several buttons labeled with cities along the eclipse path. Clicking on one of will place a pin on the globe for that city.



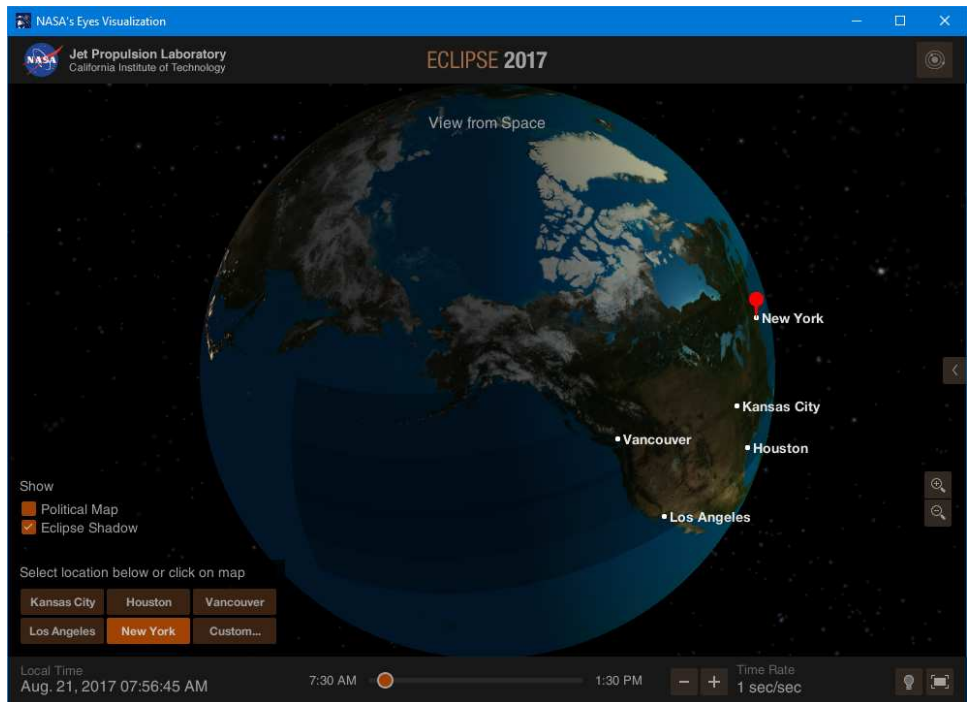
Alternately, you can enter your location coordinates. Click the **Custom...** button and enter your latitude (LAT) and longitude (LON). Click **APPLY**.



You also can find your location on the globe. Use the Zoom buttons on the right side of the Earth panel to zoom into your location.



Click and drag the globe to center your location as you zoom into it.



Click on your location to place a pin. The geographic coordinates of the pin will appear in the LAT and LON boxes.



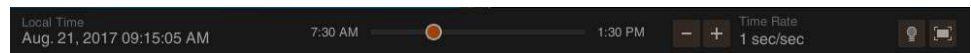
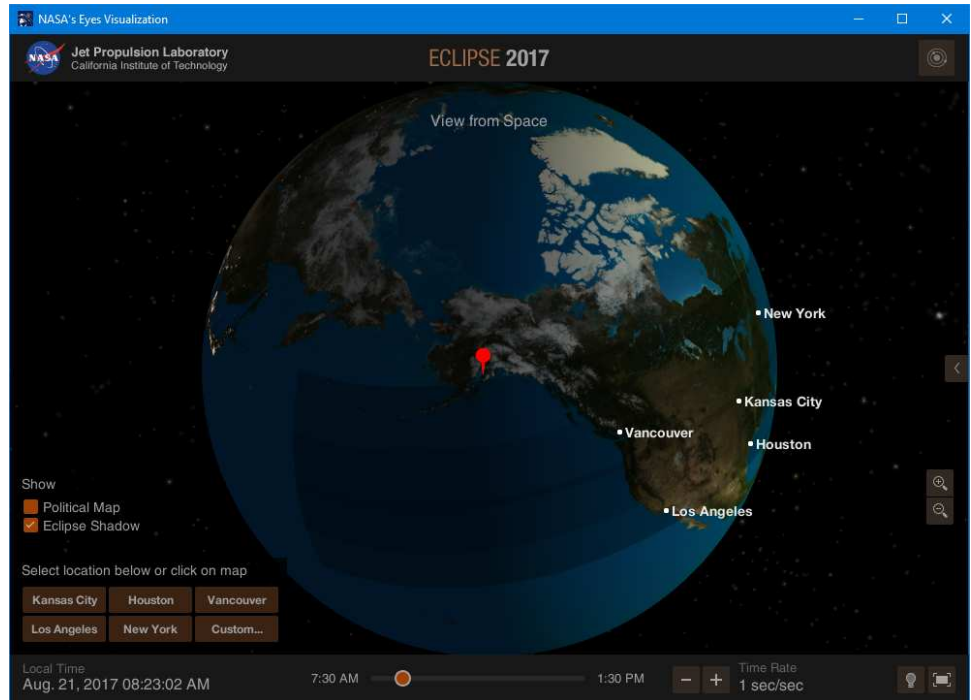
In the screenshot right, I placed a pin at the location of my Coho Radio Observatory in southcentral Alaska.

NASA Eyes does not remember the location and allows only one pin. Buttons on the lower-left of the Earth panel allow you to turn the eclipse shadow on or off and to show state and country boundaries.

At this point, you may want to run an eclipse simulation. At the very bottom of the Earth panel is a time slider. The time shown on the left and right ends of the slider are the start and stop times of the simulation based on the time zone used by your PC.

You can manually move the slider to any time and you will see some Sun images move along the eclipse path. The images indicate how the Sun looks with total obscuration and 75% and 50% obscuration north and south of the totality path.

Just to the right of the slider are + and - buttons. Use these to speed up, slow down and pause the simulation. The fastest speed is 30 simulation minutes for each second and the slowest is real time of 1 simulation second for each second. The time displayed on the left-bottom of the window shows the eclipse time.



4. Using the Sun Panel

When finished with the Earth panel, click the left-pointing arrow on the right edge of the window to open both panels.

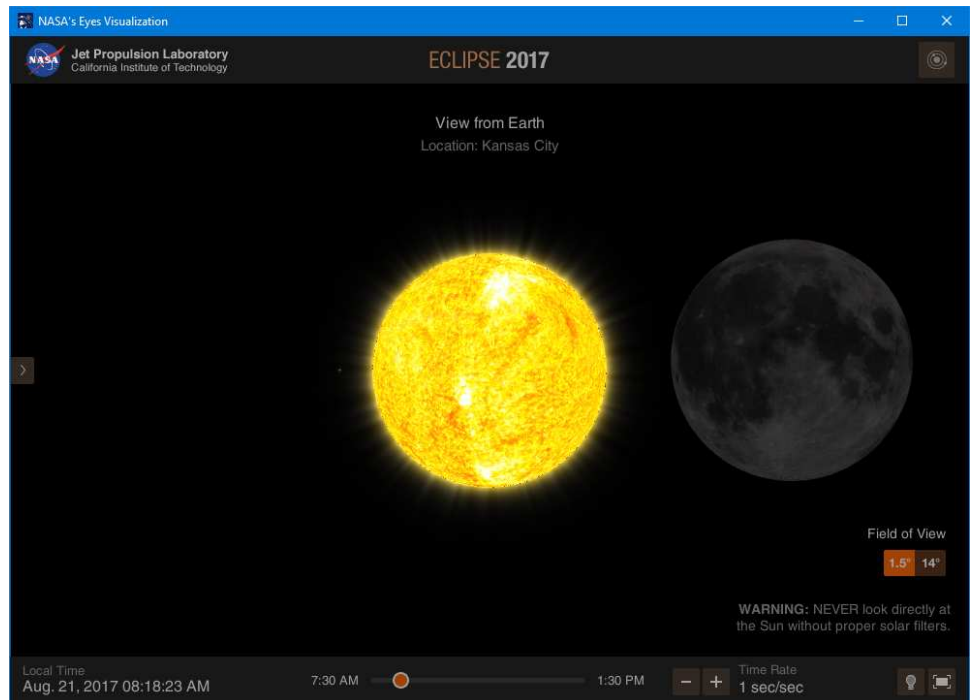
Click on the left arrow again to view only the Sun panel as shown in the image right.

The Sun panel shows the Sun and Moon as viewed from the Earth position indicated by the pin placed as described in the previous section.

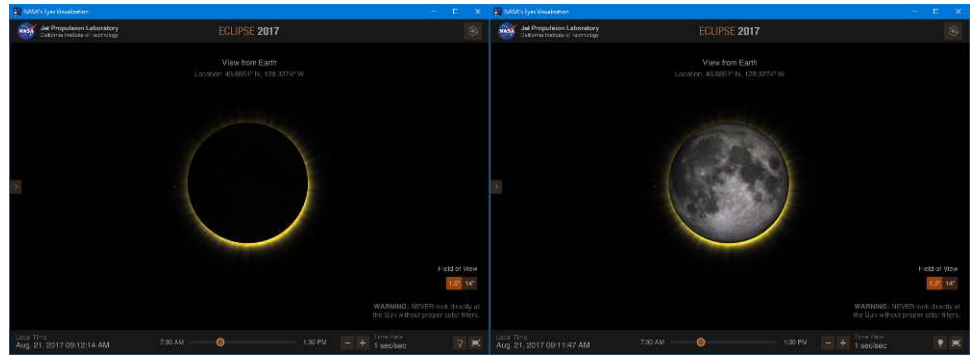
The Moon can be manually moved across the Sun by dragging the time slider in the bar at the bottom of the window. If the Earth pin is on the totality path, the Moon will completely obscure the Sun; otherwise, it will show only a partial eclipse.

The eclipse can be animated and paused by adjusting the + and – buttons at the bottom of the window. Note that the Moon moves from right to left during the eclipse, and the path it follows depend on the Earth pin's position.

The Sun panel also has **Field of View** selection buttons on the lower-right of the window. The image right is set to 1.5°.



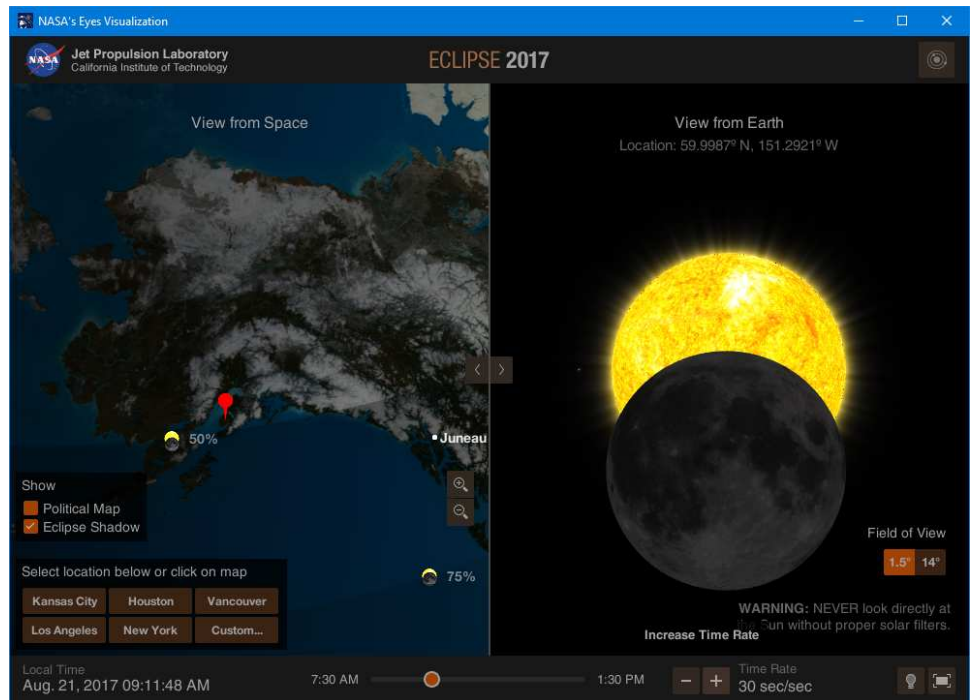
The Sun panel has a Lighting Mode toggle in the lower-right corner. Look for the lightbulb icon next to the Full Screen icon. The toggle button simply turns off or on the backlight of the Moon's image. See comparative images right.



You can run the simulation at the same time in both panels. If in one-panel view, click the arrow on the edge of the window to go to the two-panel view.

Zoom into your location and set the simulation speed, or you can manually drag the time slider to place the Moon at any eclipse point.

Manually changing the slider resets the simulation speed to 1 second per second.




4. Closing Up

It is not obvious how to get back to the **Main** window when you are finished with the 2017 Eclipse module. In the upper-right corner of the title bar, click the concentric circles icon to Exit the Earth/Sun panels window to the Eyes on the Solar System window. This will take you back to the view of the solar system where you can use the many other features to explore the solar system.



Now you can exit to the NASA Eyes **Main** control panel window. Click the third button from the bottom of the control panel in the lower-right corner. Click OK when asked to confirm Exit. The program will close and automatically reopen the **Main** control panel window. Here you can use some of the many other features of NASA Eyes Visualization.



If you would like to completely close the application, click the  in the upper-right corner of the window. You also can do this from any of the modules.



6. Weblinks and References

{NASAeyes} [http://eyes.nasa.gov/launch2.html?document=\\$SERVERURL/content/documents/msl/edl.xml](http://eyes.nasa.gov/launch2.html?document=$SERVERURL/content/documents/msl/edl.xml)

[ReeveVHF] Reeve, W. and Monstein, C., Planning for the 2017 Solar Eclipse at VHF and UHF, Radio Astronomy, January-February 2017

[ReeveVLF] Reeve, W., Planning for the 2017 Solar Eclipse at VLF and LF, Radio Astronomy, November-December 2016

[ThiemanHF] Thieman, J. and Higgins, C., Radio Jove Participation in the Great American Eclipse of 2017, November-December 2016

Document information

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