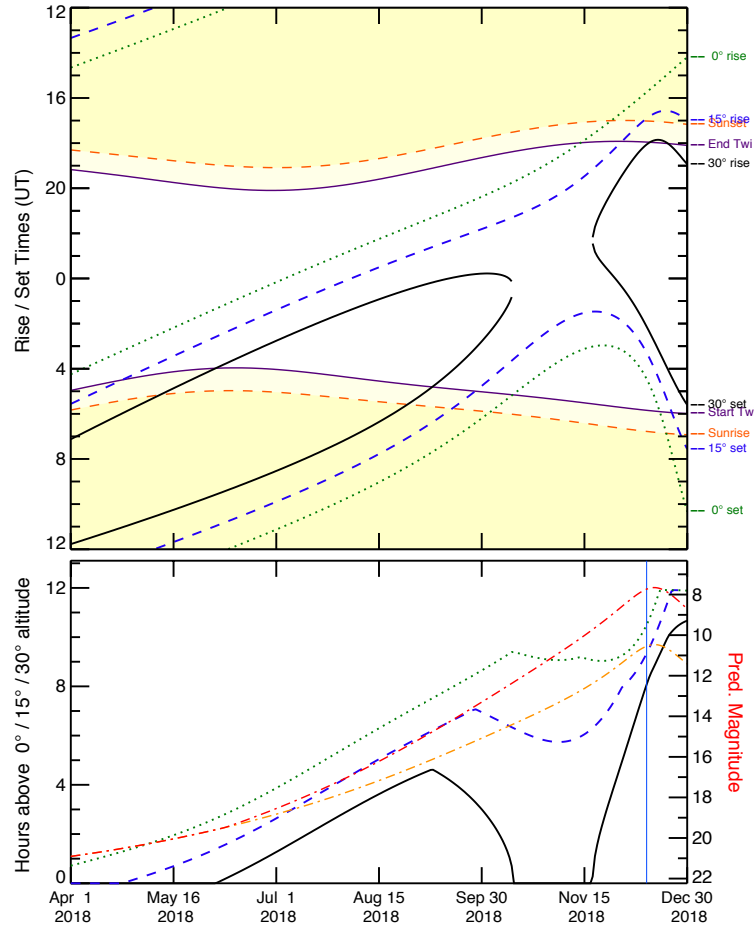


Wirtanen (2018)      Perihelion Date    2018 Dec 12 23:33:20

Perihelion (JD)	2458465.4814900	Epoch	2000.0
Period (years)	5.4388223	Inclination (deg)	11.7476000
Semimajor axis (AU)	3.0926914	Long ascending node (deg)	82.1603000
Perihelion dist (AU)	1.0553500	Arg. of perihelion (deg)	356.3890000
Eccentricity	0.6587600		

Site: L/L    Lat = 30.0    Long = 0.0



## Rise/set and visibility Plots

These plots provide an estimate of the timing of events for the object of interest, for different observing sites. They give results that are good to a few minutes accuracy, and are intended for general information and planning purposes. If detailed times are needed, you should go to the NASA Horizons site to obtain more accurate information.

Plots are provided for latitude intervals of 5 degrees.

The Rise and Set times are listed as UT. However, because they are calculated for 0 degrees longitude, the given times will also approximate the local times for other longitudes. (There will be a systematic offset, typically less than ½ hr, depending on how far you are located from the center of your time zone).

Instructions and examples of how to read the plots are given in the following pages.

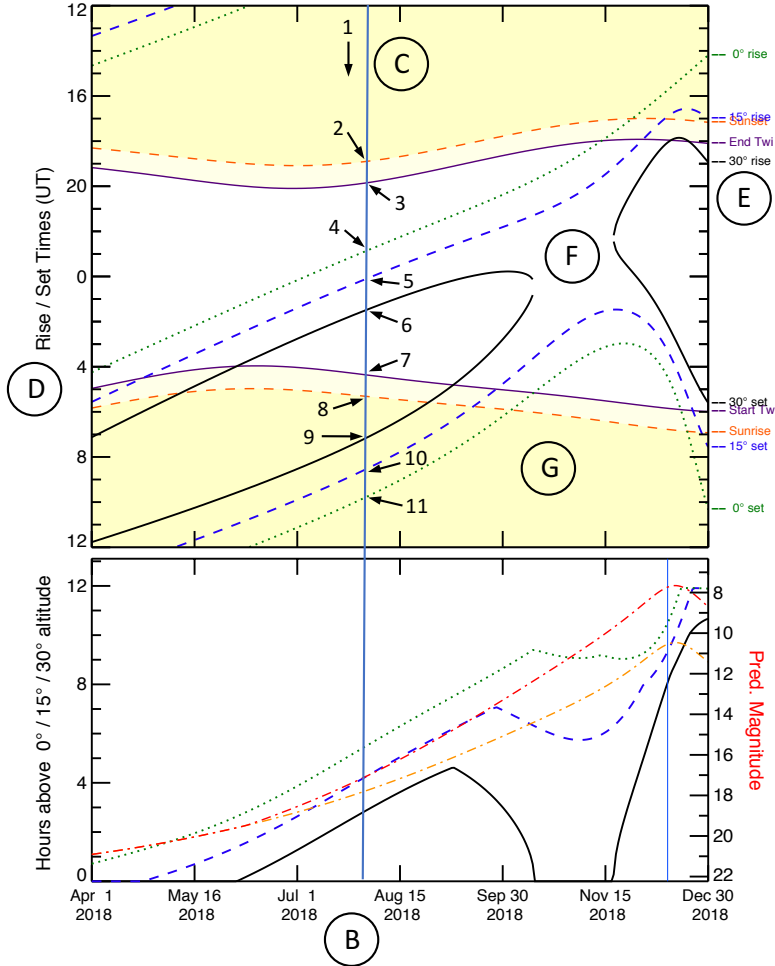
Wirtanen (2018)

Perihelion (JD) 2458465.4814900  
 Period (years) 5.4388223  
 Semimajor axis (AU) 3.0926914  
 Perihelion dist (AU) 1.0553500  
 Eccentricity 0.6587600

Perihelion Date 2018 Dec 12 23:33:20

Epoch 2000.0  
 Inclination (deg) 11.7476000  
 Long ascending node (deg) 82.1603000  
 Arg. of perihelion (deg) 356.3890000

Site: L/L Lat = 30.0 Long = 0.0



## How to read the Rise/Set time plots.

- Make sure you have the correct plot for the latitude of your observation site
- Select the date of interest along the bottom of the plot
- Events happen along the vertical line for that date, starting at the top and reading down.
- Times listed on the left are noted as UT, but also approximate the local time for other longitudes
- Events are labeled on the right side, with the lines color coded:
  - Red Sunset/Sunrise
  - Purple Start/End Nautical Twilight
  - Green Rise/Set at the horizon (0 degrees)
  - Blue Rise/Set at an altitude 15 degrees
  - Black Rise/Set at an altitude 30 degrees
- If a line doesn't exist on a particular day, that event never happens (e.g., For Nov 1, 2018, the comet never reaches 30 degrees altitude)
- The sky is
  - Bright (sun is above the horizon) for the times in bright yellow area
  - Twilit (sun is less than 30 degrees below the horizon) for times in light yellow area
  - Dark (sun is down) for times in the white area
- Example reading, illustrated by the vertical blue line:
  - For Aug 1, 2018 (2/3 of the way between Jul 1 and Aug 15), read down from the top
  - Sunset occurs at 19:00
  - Nautical Twilight ends at 20:00
  - Object rises above the horizon at 22:45
  - Object rises above 15 degrees altitude at 00:15
  - Object rises above 30 degrees altitude at 01:30
  - Nautical Twilight starts at 04:15
  - Sunrise occurs at 05:15
  - Object drops below 30 degrees altitude at 07:15
  - Object drops below 15 degrees altitude at 08:30
  - Object sets below the horizon at 09:45

See next page for instructions on the object visibility (bottom) plot.

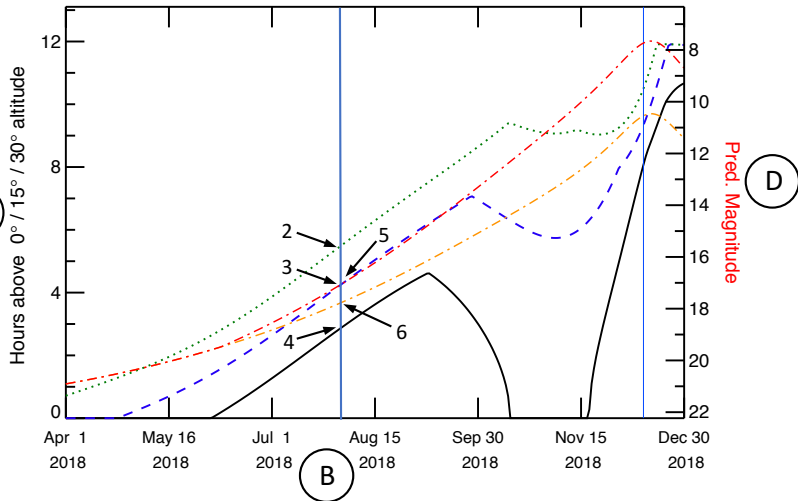
Wirtanen (2018)

Perihelion (JD) 2458465.4814900  
 Period (years) 5.4386223  
 Semimajor axis (AU) 3.0926914  
 Perihelion dist (AU) 1.0553500  
 Eccentricity 0.6587600

Perihelion Date 2018 Dec 12 23:33:20

Epoch 2000.0  
 Inclination (deg) 11.7476000  
 Long ascending node (deg) 82.1603000  
 Arg. of perihelion (deg) 156.3890000

Site: L/L Lat = 30.0 Long = 0.0



## How to read the object visibility plot.

- Make sure you have the correct plot for the latitude of your observation site
- Select the date of interest along the bottom of the plot
- The visibility curves are color coded in the same colors as the Rise/Set plot. They correspond to the scale on the left side
  - Green Number of hours the object is above the horizon (0 degrees)
  - Blue Number of hours the object is above 15 degrees altitude
  - Black Number of hours the object is above 30 degrees altitude
- The predicted magnitudes of the object correspond to the scale on the right
  - Red Total predicted magnitude
  - Orange Predicted nucleus magnitude
- Example reading, illustrated by the vertical blue line:
  - For Aug 1, 2018 (2/3 of the way between Jul 1 and Aug 15)
  - Object is above the horizon for 5.3 hr
  - Object is above 15 degrees altitude for 4.2 hr
  - Object is above 30 degrees altitude for 2.8 hr
  - Total predicted magnitude is 17.0
  - Predicted nucleus magnitude is 17.7