**Winter Solstice Sky Observatory**

**Researcher Vitalii Shermet will share his enthusiasm for astronomy and some amazing sky views during winter solstice week. Join Vitalii for close up observations of the winter sky while you celebrate the changing season at beautiful South Cape Beach State Park.**

**Check the weather. Cloudy, overcast skies, rain or snow cancels. Dress warmly for the outdoors and meet at Mashpee town beach parking lot at South Cape Beach. Program offered December 18, 19 and 20 at dusk if sky is clear. Contact 508-457-0495 ext.125 for more information.**

**This event is free and open to all ages.**

The winter solstice will occur next week on Dec 21, 2017.

Around this time the sun sets into the sea over Vineyard Sound if observed from the South Cape Beach.

During that week we will attempt to measure the exact time of the sunset in order to study the effect of light refraction near horizon.

According to the United States Naval Observatory, for computational purposes, sunrise or sunset is defined to occur when the geometric zenith distance of center of the Sun is 90.8333 degrees.

That is, the center of the Sun is geometrically 50 arc minutes below a horizontal plane.

For an observer at sea level with a level, unobstructed horizon,

average atmospheric conditions,

the upper limb of the Sun will then appear to be tangent to the horizon.

The 50-arcminute geometric depression of the Sun's center used for the computations is obtained by adding the average apparent radius of the Sun (16 arcminutes) to the average amount of atmospheric refraction at the horizon (34 arcminutes).

Table below lists the predicted times of the sunsets as viewed from South Cape Beach Parking Lot East

Date Time\_EST Azimuth\_degrees

2017/12/17 16:13:52 -121.099134683

2017/12/18 16:14:15 -121.136236271

2017/12/19 16:14:40 -121.162109028

2017/12/20 16:15:07 -121.176780274

2017/12/21 16:15:36 -121.180195368 \* Winter Solstice Sunset

2017/12/22 16:16:07 -121.172354311

2017/12/23 16:16:41 -121.153257102

2017/12/24 16:17:16 -121.122931062

2017/12/25 16:17:54 -121.081348871

Let us see if we can detect any differences from these values calculated with the PyEphem program.

The weather forecast for the next week shows variable conditions so we will make the first attempt on Monday, December 18. We will meet at the parking lot at 15:45 EST.

Bring a watch synchronized with UTC

if you have one. Some watches have automatic atomic time synchronization. Binoculars are also helpful.

We have several extra binoculars for this event. Our goal is to pinpoint the moment when the last ray of the sun vanishes.

