

The Texas Star Party Advanced Observing Program - 2023

"WITHIN"

Abstract

As visual astronomers we are privileged to view the universe the way it really appears, without resorting to special effects to bring out faint diffuse detail, which may render a nice but false impression. Often, however we settle for a casual visual observation and view the entire object without attempting to discern internal features - which may be viewable, if we make the effort. Observing massive H_{II} star forming regions, similar to the Orion nebula, 1,400 light years away in the Milky Way Galaxy is always a treat. However, it is even more exciting to view with our own eyes, small structural features which make-up these diffuse nebulae which are often visible – If we only look. These may be Herbig-Haro (HH) Objects, star clusters, protostars or proplyds, dark nebula or other interesting objects.

To many folks visually seeing internal details within other galaxies, millions of light years away, borders on a science fiction expedition. However, with a photo and a good night sky plus a boatload of patience, anybody with moderate sized optics can discern open clusters and H_{II} regions in some galaxies - If one knows where to look. It is always nice to observe the galaxy NGC4214, located a comoving 10.2 million light years away ($H_0=69.6 \text{ km}^{-5}.\text{Mpc}$), but it becomes really exciting when we identify a few of the H_{II} star forming/open cluster regions which are prominent components of this galaxy. NGC4449, a starburst dwarf galaxy 13.3

million light years away, is full of H_{II} regions and massive young star clusters, and all are located inside a distorted and irregular envelope. This apparent visual "train-wreck" is the product of several interactions with nearby galaxies and at least two merger events. However, few visual observers have taken the time to separately and individually identify many of these bright and interesting internal features. This takes time but it is highly rewarding.

This years Advanced Observing Program presents 40 deep sky objects with viewable internal features, most of which have been overlooked by visual observers. Those who successfully observe 20 of the listed items will receive a TSP Advanced Observing Pin. While it is not required to see the internal feature, it IS REQUIRED that you try.

This is why I am a visual astronomer – To visually boldly go where few or none have gone before and to witness with my own eyesight these magnificent objects.

Larry Mitchell

**TSP Advanced Observing Program
Chairman**