

# Observation Plan: 2025-04-16

## 1. Overall Conditions Assessment

Conditions are rated as **Average**. While the weather forecast predicts clear skies (0% cloud cover) and good seeing, the Bortle 8 sky and significant light dome in the south will significantly impact imaging, particularly for objects at low southern altitudes. The moon is below the horizon, eliminating moonlight interference. The equipment (Apertura 75Q and ZWO ASI585MC Pro) is suitable for deep-sky objects, but the light pollution will require careful target selection and filter usage.

## 2. Top Recommended Targets

The following targets are selected based on their altitude, observability duration, size relative to the field of view, and suitability for the given conditions. Prioritization is given to objects at higher altitudes to mitigate the effects of light pollution.

### Target 1:

- **Target:** M51 (Whirlpool Galaxy)
- **Observability:** Peak altitude 88.45 deg, Duration 6.83 hr.
- **Framing Analysis:** Object Size (10.00'x7.59') vs Equipment FOV (94.5' x 53.2') - **Good Fit**. The galaxy will occupy a significant portion of the field of view, allowing for good detail capture.
- **Filter Choice & Justification: No Filter.** M51 is a relatively bright galaxy, and its high altitude minimizes the impact of the light dome. While a narrowband filter would improve contrast, it's not strictly necessary for this bright object under these conditions.
- **Imaging Tips:** Beginner: Focus carefully on the core of the galaxy. Advanced: Employ dithering to reduce noise and create a high-dynamic range image, making the most of the relatively large FOV.

### Target 2:

- **Target:** M101 (Pinwheel Galaxy)
- **Observability:** Peak altitude 81.29 deg, Duration 6.83 hr.
- **Framing Analysis:** Object Size (21.88'x20.89') vs Equipment FOV (94.5' x 53.2') - **Widefield**. The large size of M101 allows for capture of its extended spiral arms within the camera's FOV.
- **Filter Choice & Justification: No Filter.** Similar to M51, the high altitude makes a narrowband filter unnecessary for this observation.
- **Imaging Tips:** Beginner: Pay attention to guiding to keep the image sharp over long exposures. Advanced: Consider using a luminosity mask to enhance the fainter outer arms that may be challenging in Bortle 8 conditions.

### Target 3:

- **Target:** M13 (Hercules Globular Cluster)
- **Observability:** Peak altitude 80.89 deg, Duration 5.83 hr.
- **Framing Analysis:** Object Size (33.00'x33.00') vs Equipment FOV (94.5' x 53.2') - **Widefield**. The cluster will fill a sizable portion of the frame.
- **Filter Choice & Justification:** **No Filter**. As with M51 and M101, M13 is bright and high enough above the horizon where the benefits of using a Narrowband filter are outweighed by the reduction in image brightness.
- **Imaging Tips:** Beginner: Short exposures are sufficient due to the brightness of the target. Advanced: Explore different exposure lengths to capture both the core density and outer stars without blowing out the bright center.

#### Target 4:

- **Target:** NGC 7000 (North America Nebula)
- **Observability:** Peak altitude 48.75 deg, Duration 2.08 hr.
- **Framing Analysis:** Object Size (N/A) vs Equipment FOV (94.5' x 53.2') - **Requires Mosaic**. The North America Nebula is large, therefore a mosaic is necessary to capture the whole nebula. A 2x1 grid would probably be suitable.
- **Filter Choice & Justification:** **Dual Narrowband Filter**. Given the lower altitude and Bortle 8 conditions, the dual-narrowband filter is crucial for cutting through light pollution and enhancing the nebula's contrast. This will help mitigate the effects of the southern light dome.
- **Imaging Tips:** Beginner: Start with shorter exposures to get a good focus. Advanced: Plan the mosaic carefully, including overlap between shots to enable proper registration during post-processing. The high pixel scale (1.48 arcsec/pixel) will result in finely detailed images; however, you may want to consider binning during capture for speed and less demand on storage space, especially given the mosaic and the relatively low altitude.

**Note:** M81 is excluded due to its lower altitude (66.46 deg), making it more susceptible to light pollution. Although it has a long duration above the 30-degree threshold, the light pollution will be more problematic even with a filter.