Advanced Astrophotography Checklist

Print this page and tick items off before and during your session. From Telescope Trove.

Plan the session

- Pick a dark site (Bortle 4 or darker is ideal, use lightpollutionmap.info)
- Arrive before sunset to set up in daylight, level the tripod, polar align the mount
- Pick a target that suits your lens: Milky Way with 24mm, Orion Nebula M42 in winter, Andromeda M31 in autumn and winter, Moon at crescent or quarter phase

Focus

- Switch to manual focus and use Live View on a bright star, adjust until the star is as small as possible
- Use a Bahtinov mask ($10-30): a symmetrical pattern means perfect focus
- Recheck focus every 30-60 minutes, temperature changes shift the focus point
- Check focus at 100% zoom on the LCD, stars that look sharp small may be soft on a computer

Expose

- Apply the 500 rule: 500 divided by focal length, and divide by the crop factor first (24mm on 1.5x crop behaves like 36mm, 13 seconds max)
- Take a test shot and zoom in to check stars for elongation
- Use ISO 1600-3200 for the best balance, above ISO 6400 usually adds more noise than signal
- Aim for at least 30 minutes of total exposure per target

- Use a 2-second timer delay or a remote shutter release ($10-20) to kill vibration

Stack

- Take 20-50 exposures of 2-5 minutes for deep-sky targets
- Take dark, flat and bias calibration frames (adds 10-15 minutes, noticeable difference)
- Stack with DeepSkyStacker (free) or PixInsight, the software rejects satellite trails and airplane lights

Process gently

- Stretch the histogram to brighten faint nebulosity without blowing out bright stars
- Boost mid-tone contrast with curves, reduce the background level so the sky looks black
- Calibrate color so stars look white, not blue or orange
- Apply noise reduction mainly to the background, not to stars or nebulosity

Cold and dew

- Bring at least 3 fully charged batteries for a long session
- Wrap a dew heater strip around the lens barrel
- Dress in layers with insulated boots, gloves and a hat, hand warmers inside gloves