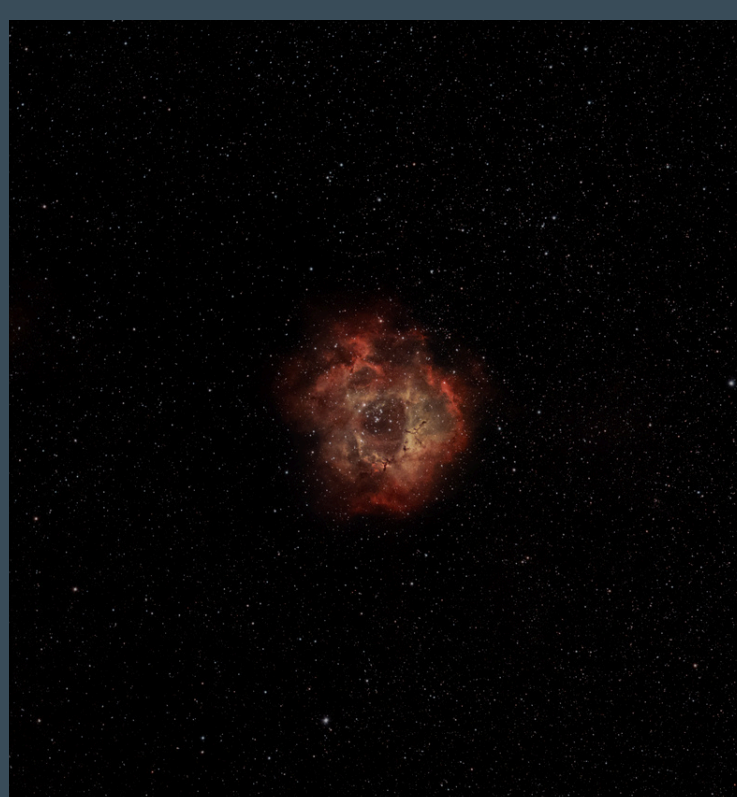
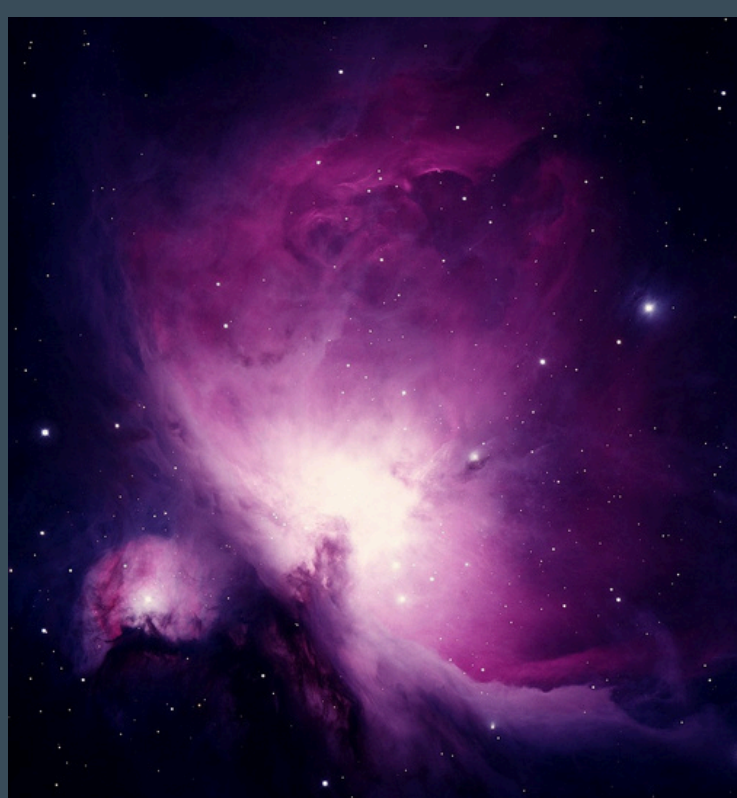


Astrophotography Focusing Checklist

AstroEdit
@GetAstroEdit



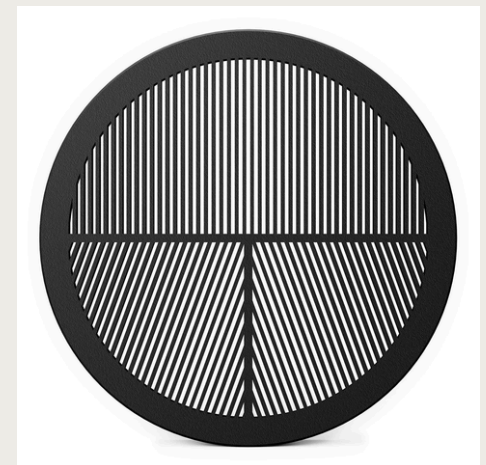
Introduction

This checklist is broken down into two sections, one for users who have a DSLR / Mirrorless camera and will use its Live View feature and a Bahtinov mask to achieve crystal clear focus. The other is for users who use computer controlled equipment to view their camera and achieve perfect focus.

Live View Focus and Bahtinov Mask

This checklist is for those of you who are focusing manually by looking at your cameras screen (Live View), with or without a Bahtinov mask. I would highly recommend a Bahtinov mask if you dont have one, they are generally cheap and they give clear visual feedback when you are perfectly in focus. Here's what you will need:

- Your camera (DSLR or Mirrorless)
- Your lens or telescope with camera attached
- A sturdy Tripod or mount
- Optional (But Highly recommended): A Bahtinov Mask



Step 1 - Setup Your Gear



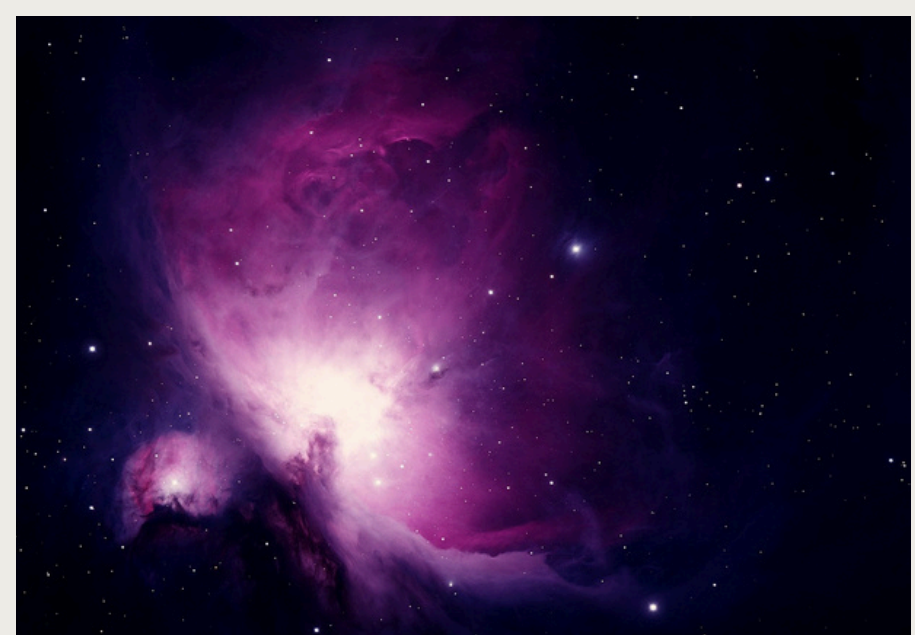
- Assemble your camera/lens or telescope setup on your tripod/mount. Ensure it's stable.
- Point your setup roughly towards the area of the sky you plan to image, or at a bright star.

Step 2 - Initial Rough Focus



- **If using a lens:** Set to Manual Focus (MF). Slide the focus ring close to the infinity mark (∞), but not right against the hard stop. Look at something in the distance to roughly judge when its in focus. It doesnt have to be perfect at this point.
- **If using a telescope:** Move the focuser roughly to where you expect focus to be (possibly from a previous sessions). Look at something in the distance to roughly judge when its in focus. It doesnt have to be perfect at this point.

Quick Tip - It can be much easier to do this part in the daytime. Just make sure you look at something far away to make sure you are as close to infinite focus as possible.



Astrophotography Focusing Checklist

Step 3 - Turn on Live View



- Switch your camera to Live View mode so you can see what the sensor sees on your screen.

Step 4 - Find and Magnify a Bright Star



- Slew your mount/move your camera to centre a bright star on your Live View screen.
- Find your camera's magnification buttons (often zoom icons) and magnify the view on the star as much as possible (e.g., 5x, 10x, or more). The star will look like a blurry blob.

Step 5 - Carefully Adjust Focus

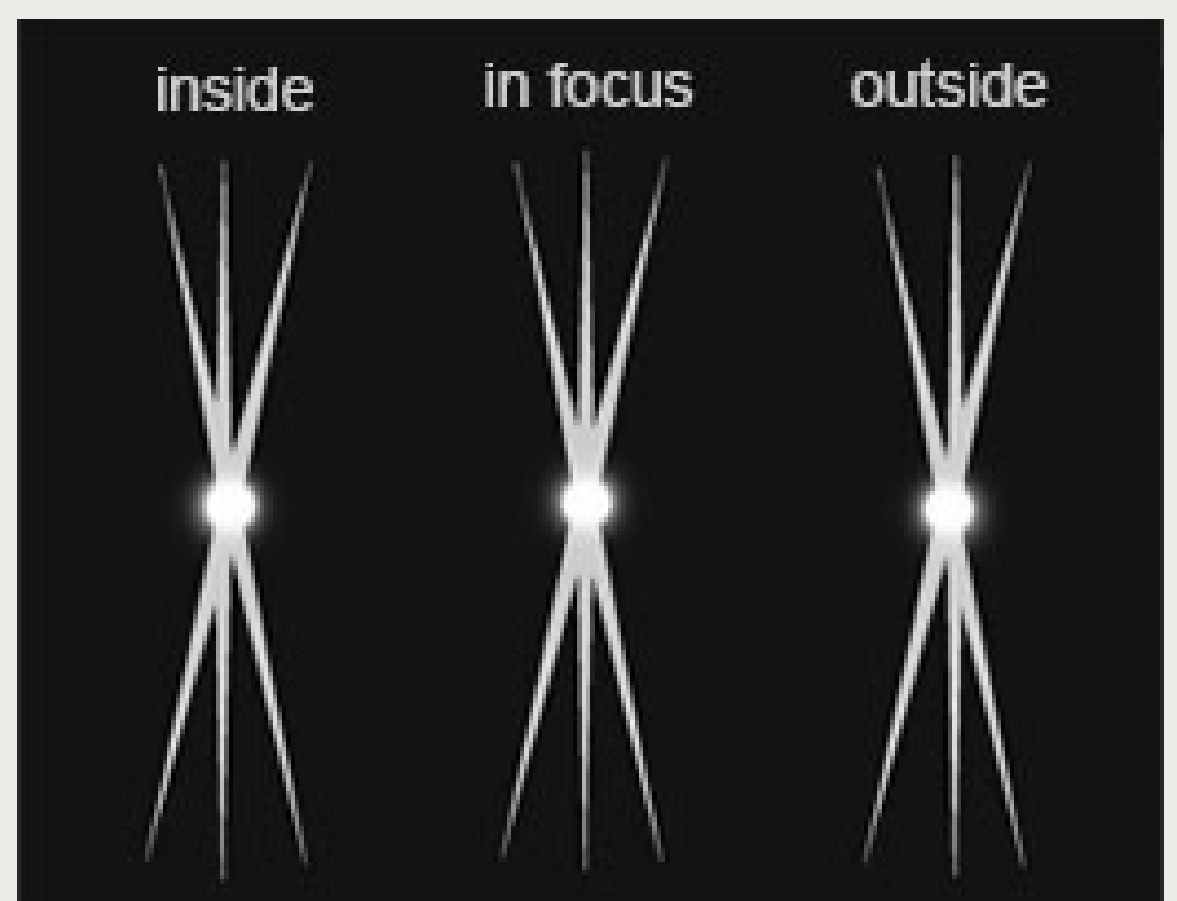


- **Slowly** adjust your focus mechanism:
 - For Lenses: Turn the focus ring gently.
 - For Telescope: Turn the focuser knob (use the fine focus knob if you have one for smaller movements).
- Watch the magnified star on your screen. As you adjust, the star blob will shrink.
- Adjust until the star appears as the smallest, tightest, most pinpoint dot you can achieve. Go slightly past the sharpest point and then come back to confirm

Step 6 - Use a Bahtinov Mask (Recommended)



- Place the Bahtinov mask over the front of your lens or telescope.
- Keep your camera in Live View, magnified on a bright star (Step 3 & 4)
- You'll see three prominent spikes around the star.
- Adjust your focus until the central spike is perfectly centered between the other two spikes, forming a symmetrical pattern (Pic right). This indicates extremely accurate focus.
- **IMPORTANT:** Remember to remove the Bahtinov mask before taking your final images!



Astrophotography Focusing Checklist

Step 7 - Take a Test Shot and Review



- Take a short exposure test photo (e.g. 10-60 seconds depending on your setup)
- Review the image on your camera screen. Zoom in tightly and examine stars across the frame (centre, edges, corners).
- Are the stars small and sharp points? If they look bloated, or soft, repeat the fine-tuning steps (Step 5 or 6).
- Once happy make sure you lock the focus in place if possible (Telescopes will usually have a locking screw for the focuser)

Step 8 - Check Focus During the Session

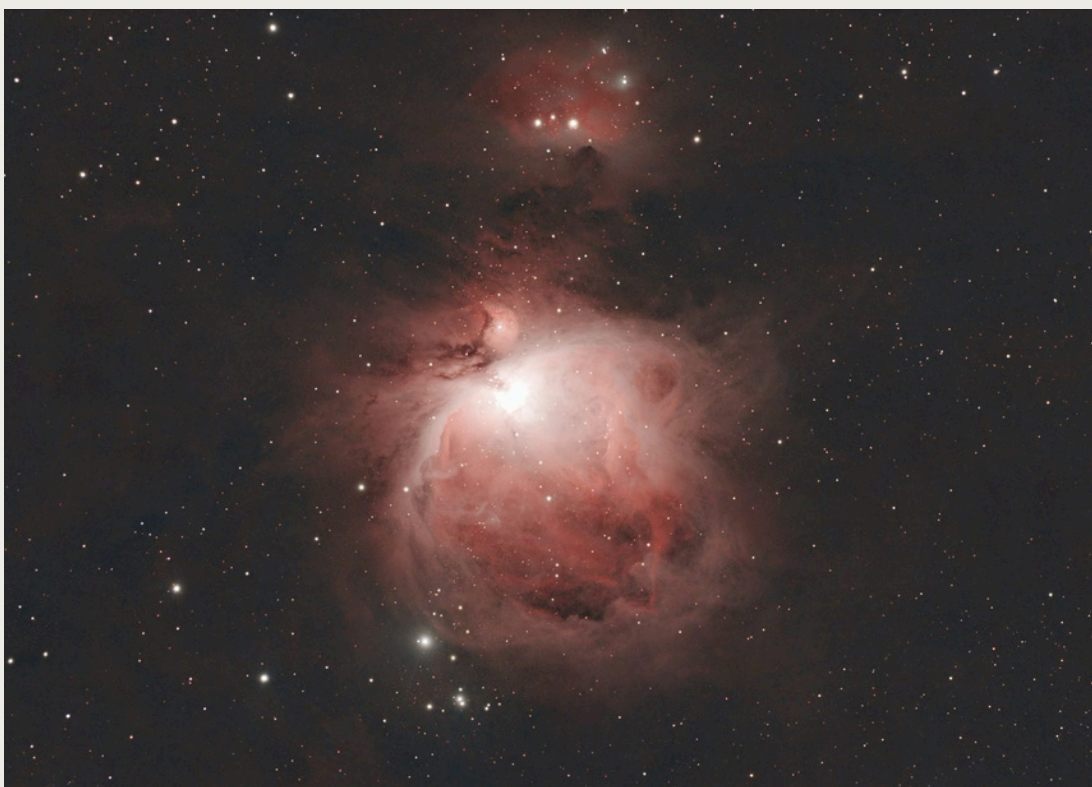


- Focus can change as the temperature drops throughout the night.
- Periodically (e.g., every 60-90 minutes, or if temperature changes noticeably) re-check focus using Live View and magnification on a star (and your Bahtinov mask if you have one). Readjust if necessary.
- This is another reason for using a Bahtinov mask - it makes rechecking quick and easy... just remember to take it off after!

Computer / Software Focus

This checklist is for you if you are using astrophotography control software (like N.I.N.A., APT, Voyager, Sequence Generator Pro, ASIAIR, Ekos, etc.) connected to your camera and mount.

- Your camera (usually a dedicated astro camera, but some DSLRs / Mirrorless work)
- Your telescope with camera attached
- A sturdy mount
- A computer or device running astrophotography control software
- Cables to connect your camera and mount to the computer/device
- **Optional:** An electronic focuser controlled by the software.



Astrophotography Focusing Checklist

Step 1 - Setup and Connect Gear



- Assemble your telescope and camera on your mount. Ensure everything is secure and stable.
- Connect your camera and mount to your computer or control device.
- Power on all equipment.

Step 2 - Open and Configure Software



- Launch your astrophotography control software.
- Connect to your camera within the software.
- Ensure you can take preview images or start a Live View/Looping function.

Step 3 - Slew to a Focusing Star



- Use your software or hand controller to point your telescope at a reasonably **bright star**. Avoid areas with heavy nebulosity. The software needs a clear star to analyze.

Step 4 - Start Live View / Image Loop

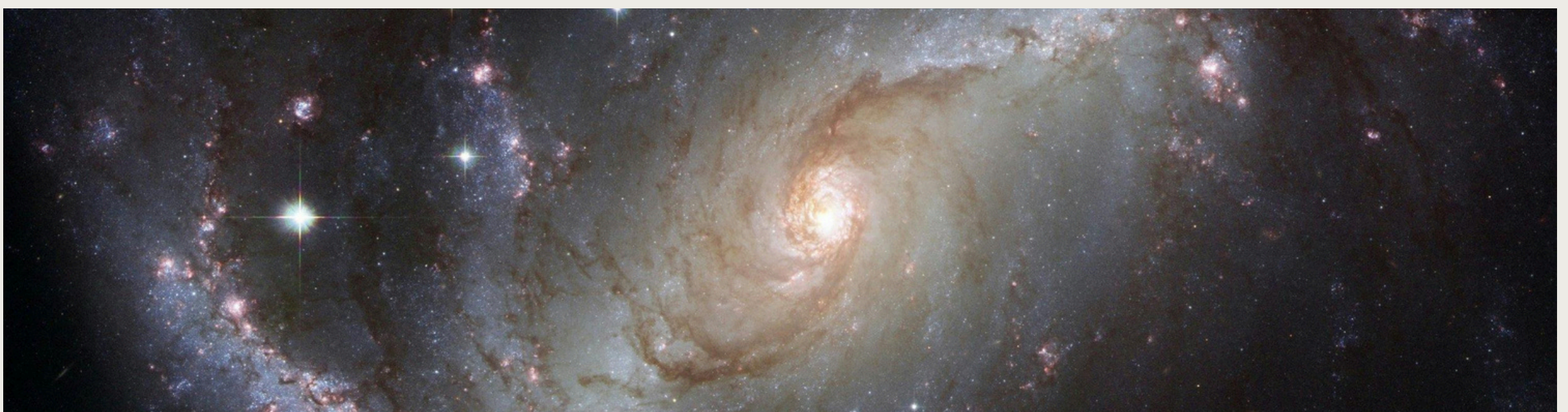


- In your software, start a continuous capture of short exposures (often called "Looping" or "Preview" mode). This gives you a real-time or near real-time view.
- Adjust exposure time and gain/ISO so the star is visible and not overexposed in the preview.

Step 5 - Activate Focus Metrics (FWHM / HFR)



- Look for the focusing tools or metrics display in your software.
- Enable the display of metrics like **FWHM (Full Width Half Maximum)** or **HFR (Half Flux Radius)**. Your software might show one or both, or similar metrics.
- **Understanding FWHM/HFR:** These numbers are a measure of how "bloated" or spread out a star's light is. **Lower numbers mean sharper, more focused stars.** Your goal is to minimize these values.



Astrophotography Focusing Checklist

Step 6 - Adjust Focus & Watch the Numbers

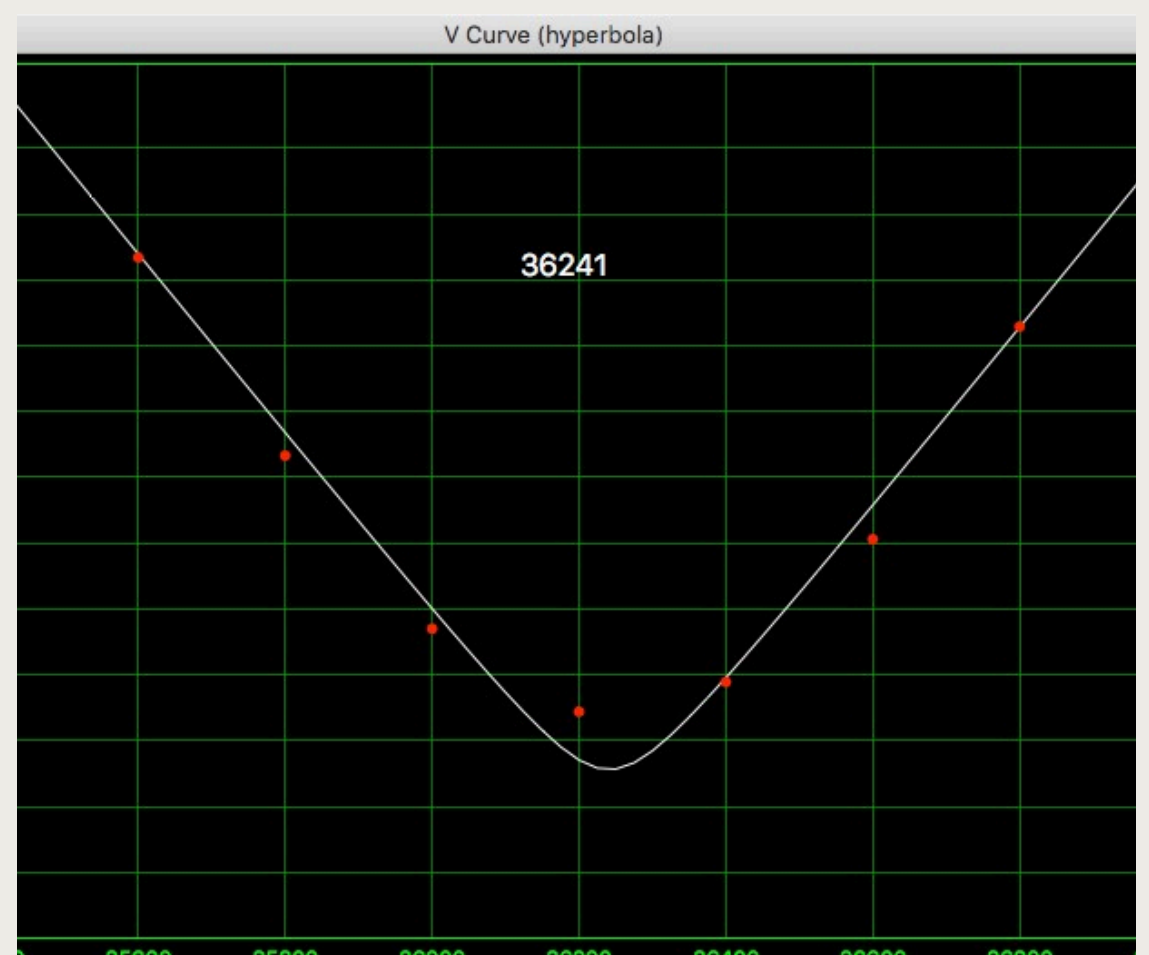


- **Slowly** adjust your focuser:
- **Manual Focuser:** Turn the knobs while watching the software screen.
- **Electronic Focuser:** Use the software's focuser controls to move the focuser in and out.
- As you adjust, observe the FWHM or HFR numbers in the software. They will decrease as you approach focus and then start to increase again as you move past it.

Step 7 - Find the Minimum Value (The "V-Curve")



- Adjust the focuser back and forth, watching the numbers. The point where the FWHM/HFR is the lowest is your point of best focus.
- Some software can plot a "V-curve": As you move the focuser in and out, the software plots the FWHM/HFR values, creating a "V" shape. The bottom tip of the "V" is the critical focus point. Use this visual aid if available to find the minimum.



Step 8 - Fine-Tune and Lock Focus



- Make very small, precise adjustments around the minimum FWHM/HFR value to find the absolute best focus point.
- Once achieved, **secure your focuser** if it's manual (ensure knobs or locking screws are tightened gently so focus doesn't slip). If electronic, note the focuser position reading in the software.

Step 9 - Check Focus During the Session



- Temperature changes will cause your equipment to expand or contract, drifting focus.
- Monitor your FWHM/HFR values periodically (e.g., every hour or if temperature changes significantly) in your software.
- If the numbers start to increase, repeat the focus adjustment steps (Steps 6-8) to regain critical focus. Electronic focusers can often be set up to automatically re-focus based on temperature changes or time intervals.

Need some help?

If you're a beginner to intermediate astrophotographer - we offer a free image consultation - a 30 min call where one of our experts breaks down an image of your choosing and will go through the top 5 areas where you can make improvements. We will even send you a report afterwards with all the details. And it's all free. Sound good? Click the link below and book your 30 min call today.

www.astroedit.co.uk/book_call

If you are still confused about how to achieve that perfect focus maybe you need some one on one help? We would be happy to give you a hand. We offer one to one training as well as longer courses to cover all your needs. Head over to www.astroedit.co.uk/training where you can book a call with one of our advisors and learn more.

- Tom
Stankowski

