

3D Printed Astronomy Tools

3-D printed Astronomy Tools

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Tools Page: <https://tinyurl.com/YodersAstronomyTools>

3D tools Created

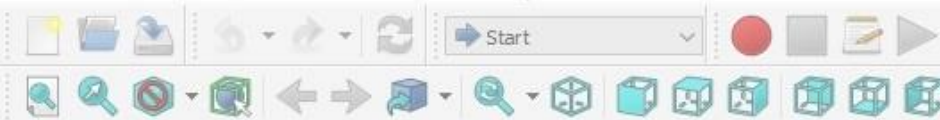
- Laser Finder
- Optical Tube Assembly (OTA) Laser
- StarSense Explorer Adapter (2 versions)
- Bahtinov Mask
- TriBahtinov Mask and Cover
- Evolution Mount Control and Battery Holder
- Mount Level Puck
- Telescope OTA Caps

Resources

- **3D Printer** – Printing objects
 - [SOVOL SV06](#) (\$200)
 - Print Size 220 x 220 x 250 mm (8.6 x 8.6 x 9.8 inch)
- **CAD Program** – Used to create object drawings
 - [FreeCad](#) (Freeware)
 - YouTube Tutorials: [MangoJelly Solutions](#)
- **Slicer Program** – Used to slice drawings for printing
 - [UltiMaker Cura](#) (Freeware)
- [UltiMaker Thingiverse](#) website – Many objects for printing

Sovol SV06 Printer





FreeCAD

Combo View

Model Tasks

- Yoders OTA Pointer
 - OTA PointerBody
 - Origin
 - EndCap Pad
 - 1.25in Shaft Pad
 - 2in Shaft Pad
 - 2in Stop Pad
 - UpperColler Pad
 - Slots Pocket

Property

Value

Saved to X: Drive

View Data

Start page

Yoders OTA Pointer : 1

Report view

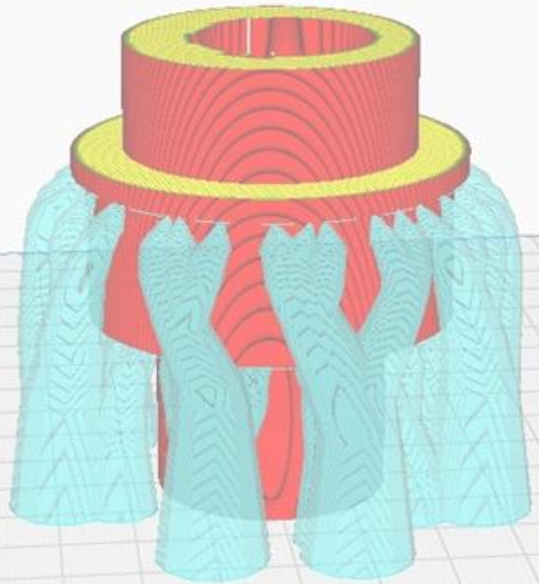


UltiMaker Cura (Slicer Program)

View type Layer view

Color scheme Line Type

PETG #3 - Standard Quality - 0.2mm 25% On Off



Object list

- SS_Yoders OTA Pointer
54.0 x 54.0 x 63.0 mm

Navigation icons: Home, Rotate, Zoom, Layer view, Print

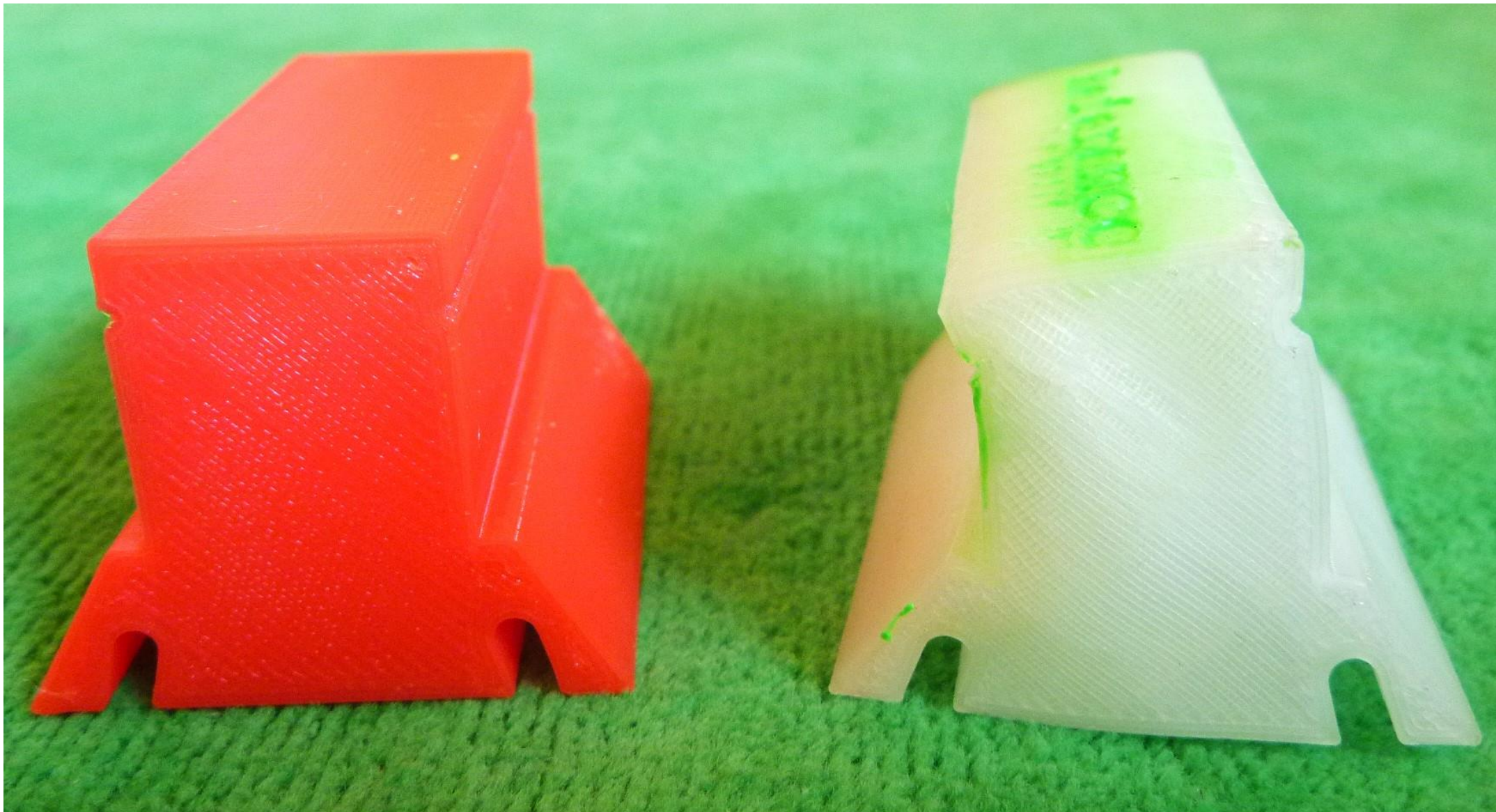
5 hours 31 minutes

42g · 14.05m

Save to Disk



Heat Can Kill



Laser Finder



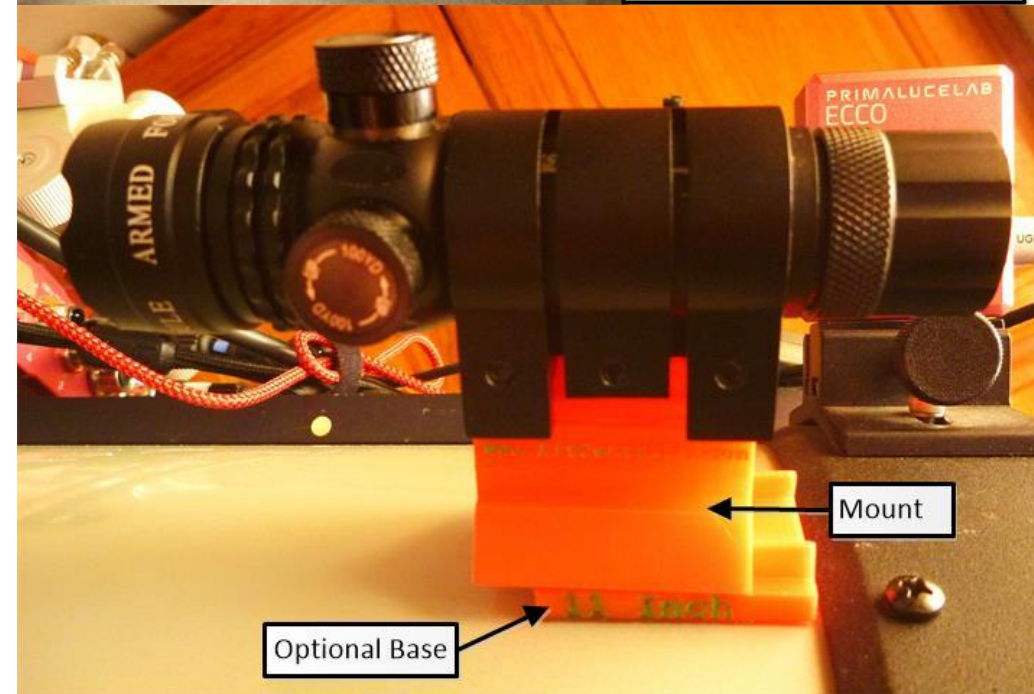
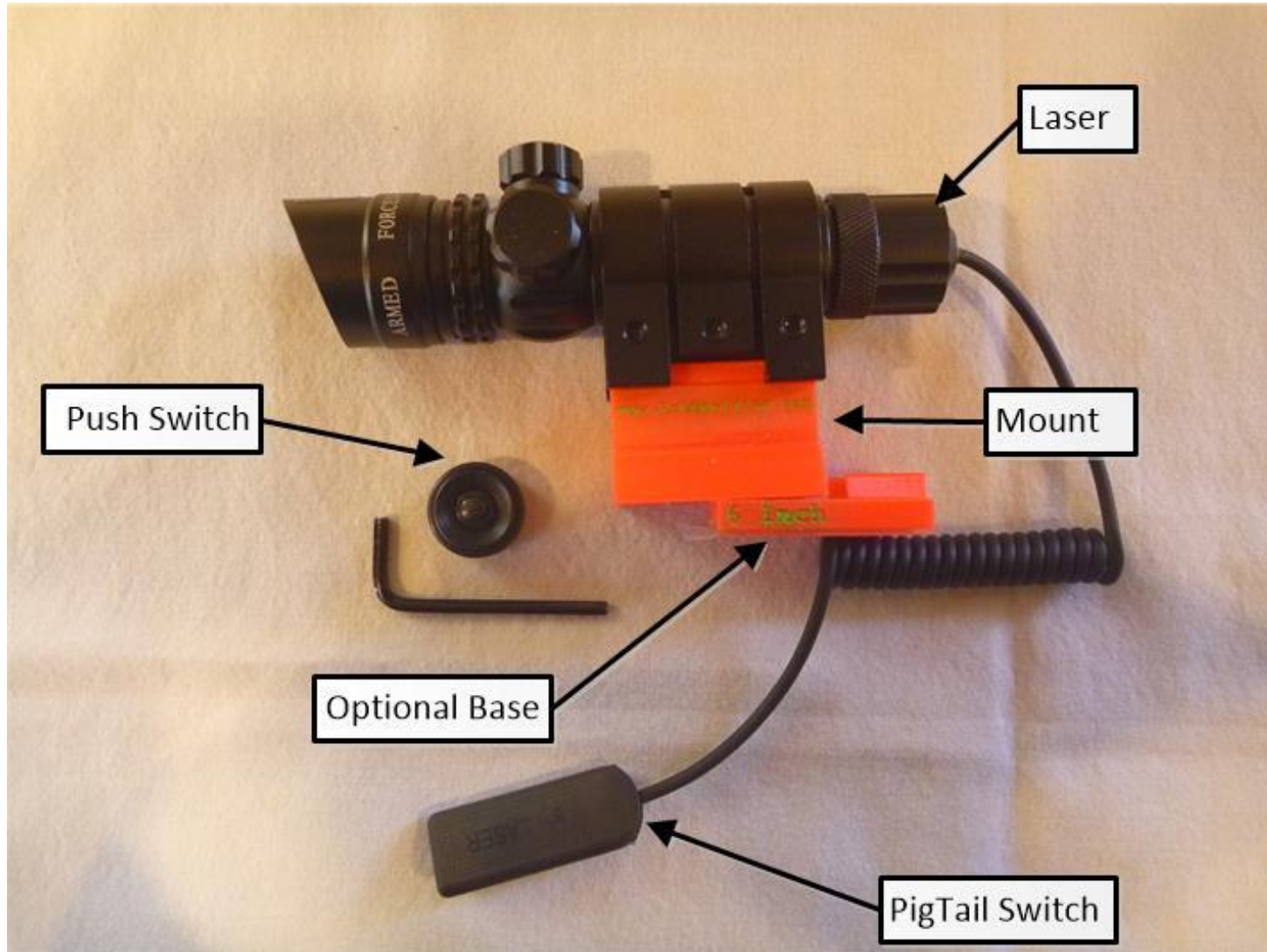
Advantages

- Utilizes Green Laser Rifle Laser
- No tools required for install or adjustment
- Fits in Vixen Style Dovetail Mounting Base
- Optional base with magnetic grip
- Not as difficult to get positioned to see where it is pointing

Drawbacks

- Can't use it during daytime
- Pigtail tends to wear out

Laser Finder



Optical Tube Assembly (OTA) Laser

- See exactly where your telescope is pointing
- Useful for finderscope alignment
- Great for Astrophotography
- Fits 1.25" and 2" eyepiece
- Laser is offset so it should not hit any central obstructions
- Laser doubles as pointer when not being used with OTA

OTA Laser



StarSense Explorer Adapters (Two Models)

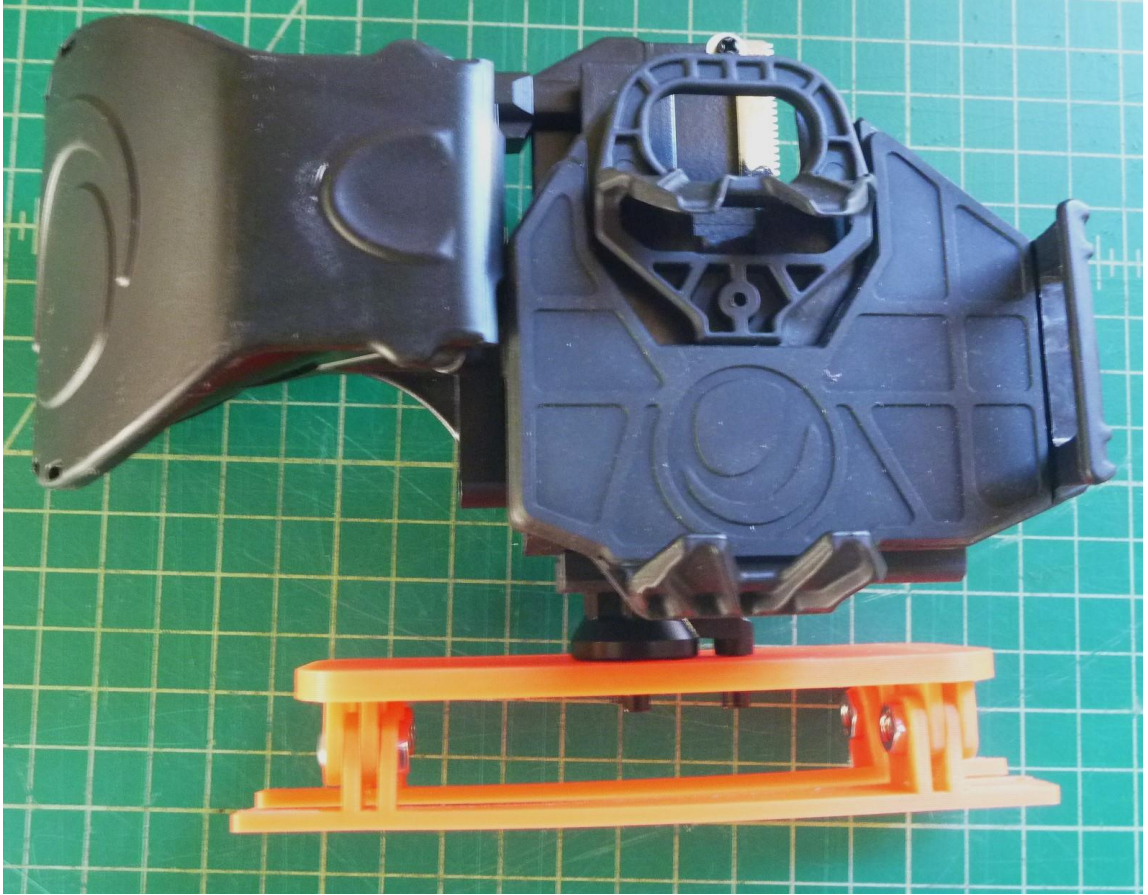
Benefits

- Removed from Celestron StarSense Explorer telescope
- User your Smart Phone to make your telescope a “Push-To” telescope
- Portable, so can be used on any telescope
- Alignment of phone to telescope is all that is required can even move telescope and use once alignment is completed

Issues

- Can struggle in areas with high light pollution or during a full moon
- Not easy to obtain since you have to purchase a telescope

StarSense Explorer: DX Model (Strap-On)



StarSense Explorer: LT Model (Dovetail)

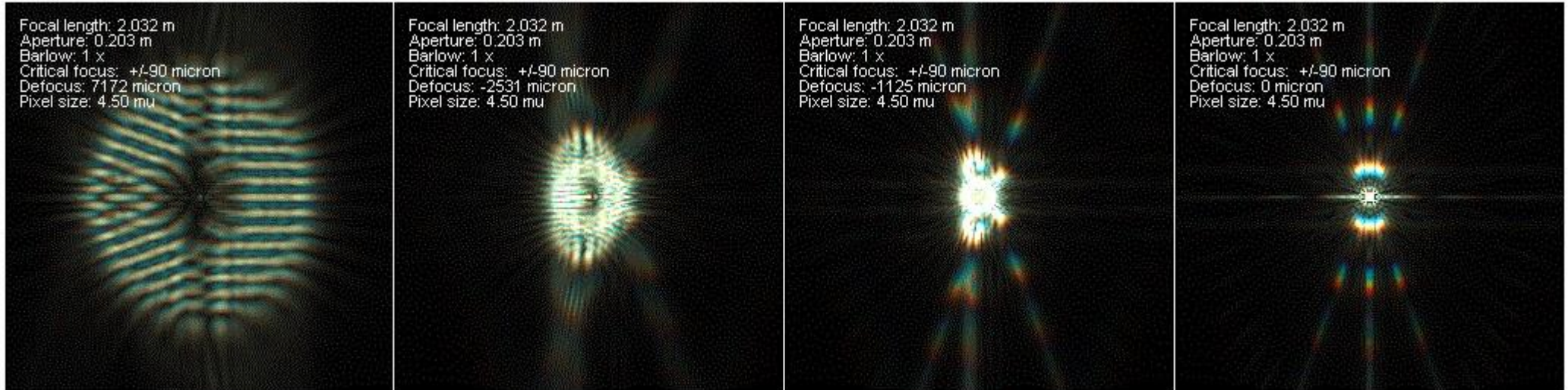


Bahtinov Mask

- Focus Aid Tool
- Very useful for AstroPhotography
- Utilize Get Hub “[Bahtinov Mask Drawings Generator](#)”
 - Focal Length
 - Outer Diameter
 - Inner Diameter
- Sleepless Nights: [Printing a Bahtinov Mask – A brief How To Guide](#)
- Addition of “Grabber” on mask with central obstruction (SCT)



Bahtinov Mask



Out of Focus

Getting Better

Getting Better

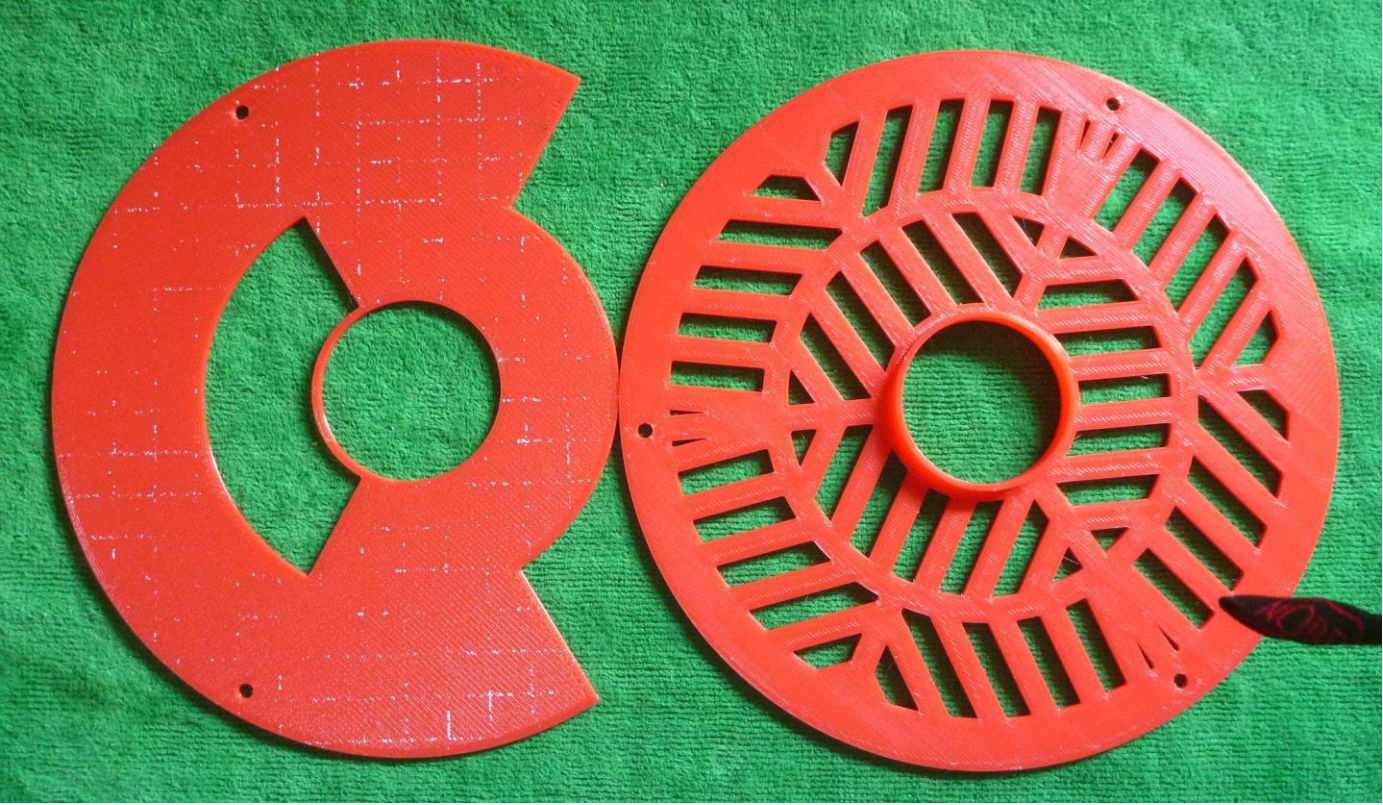
In focus!



TriBahtinov Mask and Cover

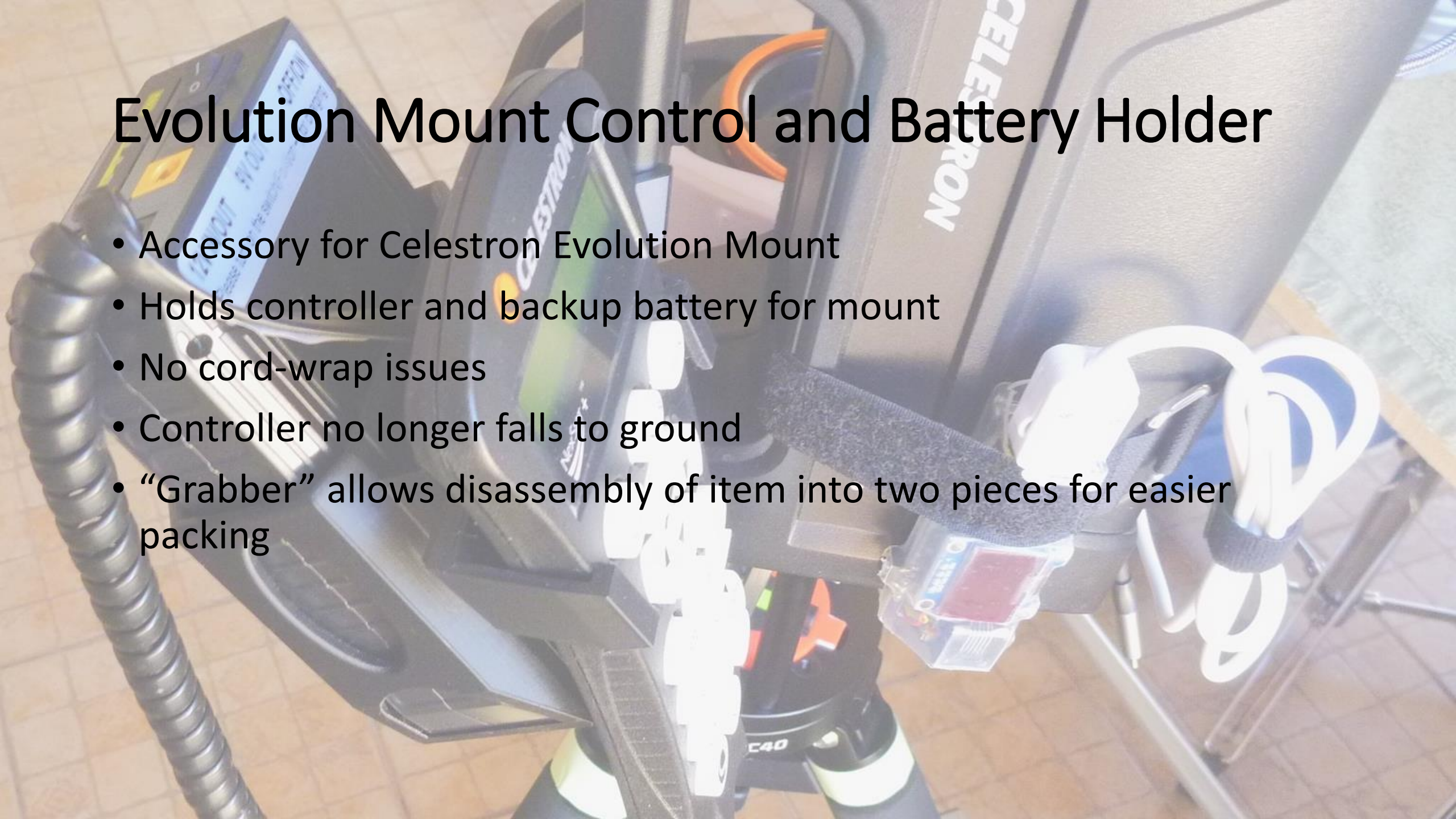
- Check Focus and Collimation
- Critical for Multiple Star observations, Planetary & Moon Imaging
- More on this tool in another presentation

TriBahtinov Mask and Cover



Evolution Mount Control and Battery Holder

- Accessory for Celestron Evolution Mount
- Holds controller and backup battery for mount
- No cord-wrap issues
- Controller no longer falls to ground
- “Grabber” allows disassembly of item into two pieces for easier packing



Evolution Mount Control and Battery Holder



Mount Level Puck

- T level design so that it is easier to identify what leg(s) need to be adjusted
- Designed for ZWO Pier Extension ZWO-PE160



Mount Level Puck



Optical Tube Assembly (OTA) Caps

- Replace Small OTA caps that break or don't work
- Two approaches:
 - Fit-Over
 - Fit-In



Optical Tube Assembly (OTA) Caps



Conclusions

- 3D printing can provide unique solutions to many problems you might encounter in astronomy, but a lot of time and effort is required to learn the process.

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