3D Printed Camera Tripod Adapter for Telescope
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Overview

Check out the sky and photograph the moon with your camera phone using the Celestron FirstScope (https://adafru.it/dwt). Our 3d printed adapter allows you to mount the telescope to any camera tripod so you can get a better view of the sky.

The FirstScope (https://adafru.it/dwt) comes with 2 standard 1.25' eye pieces and features a focal length of 300mm, so you can get a telescopic view of the sky.

Designed for Mobile Phones

This adapter was specifically designed to fit an iPhone 5s, 6 Plus, and iPhone X. The source files for the design are available to modify if you'd like to make it fit a different phone, make and model.

Parts

- Celestron FirstScope (https://adafru.it/dwt)
Tools & Supplies

- 3D Printer (https://adafru.it/doT)
- PLA Filament
- Screwdriver Tool Set (http://adafru.it/822)
- 4 Phillips Screws
- Camera Phone
- Tripod
### 3D Printing

<table>
<thead>
<tr>
<th>File Name</th>
<th>PLA @230</th>
<th>15% Infill</th>
<th>2 Shells</th>
<th>0.2 Layer Height</th>
<th>90/150 Speeds</th>
<th>Takes about 3 hours to print all parts.</th>
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</thead>
<tbody>
<tr>
<td>scope-adap-top.stl</td>
<td></td>
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<tr>
<td>scope-adap-plate.stl</td>
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<td>iphone-adapter.stl</td>
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</table>
Support Material

The `iphone-adapter.stl` part will need to be printed with support material.

Most slicing software is capable of generating support structures to aid while printing overhangs.

Test for Tolerances

The `scope-adap-plate.stl` part has a hole at the top for inserting into the screw of the FirstScope. If the hole is too small, the adapter will be too tight and won't rotate as freely. To avoid tolerance issues, we recommend using a fan while printing.
Quick Release Plate

The `scope-adap-plate.stl` is a separate part that attaches to the bottom of the `scope-adap-top.stl` part. The plate part is designed to be compatible with Manfrotto quick release plates.
Tripod Mount

You can customize this part to fit any tripod. Use a caliper (https://adafruit.it/dwv) to get the measurements of your Tripod's mounting plate. Using a free CAD app like TinkerCad or Fusion360 Design, you can recreate the mounting plate and attach it to the `scope-adap-top.stl` part.
The `scope-adap-top.stl` part has 4 mounting holes for easily attaching it to the plate part. The holes are sized for M2.5x 10 screws.

Camera Phone Adapter

The phone adapter is optimized for the iPhone 5/5S, 6 an iPhone X. You can customize this part by using a caliper to take measurements of your camera phone and modifying the solids in Fusion360.

You can also edit the sketches that fit the telescope eyepiece, as it's sized to fit a standard 1.25' eye piece.
Assembly

Rotating Base
You can easily remove the FirstScope from the rotating base by unscrewing the large knob and separating the telescope from the base. There is a one plastic washer and a metal washer that is in between the knob and the metal cylinder.

Tripod Mounting Adapter
The scope-adap-plate.stl and scope-adap-top.stl parts are secured together with 4 4x3/8 flat Philips screws.
Insert the FirstScope's metal cylinder screw into the hole of the scope-adap-top.stl part with the plastic and metal washers inserted on the opposite sides.

Place the large knob back on to the metal screw cylinder and tighten to secure it to the 3d printed mounting adapter.
Camera Phone Adapter

The camera phone adapter is optimized to fit on a iPhone 5/5s and designed to clip onto a stand 1.25' eye piece.

Press the eye piece into the adapter to snap it into place. The iPhone adapter fits best without a case.
The 1.25' standard eye piece is placed into the viewing lens part of the Celestron FirstScope. Tighten the two thumb-screws on the side to secure the eye piece.

Now you're ready for star gazing!
Usage

Using with iPhone
The phone adapter part works best with a naked/non-cased iPhone. You can take photos in either portrait or landscape by swiveling the adapter on the eye piece.

Tripod Mount
Tilt the FirstScope to a desirable angle and tighten the large knob to ensure the position is locked. Use your Tripod to reposition the tilt and pan across to get the full freedom of view. We recommend using a smooth rotating tripod head like the Manfrotto 701HDV.
Stabilize Your Shots

Use your hands to keep the telescope steady to minimize the shaking to get sharp photos. Keep one hand on the eye piece adjustable dial to keep it locked while trying to take photos.
Set Timer
Tapping the screen or hitting a button on the device actually causes a bit of shakiness, causing a blurry photo. For getting the sharp & focused photos, we recommend using a camera app that allows you to set a timer (like 2-5 seconds) so that you can allow the telescope time to stabilize before snapping a photo.

Map of the Sky
Check out the SkyWalk for iOS (https://adafru.it/dww) or Android (https://adafru.it/dwx) getting an interactive map of the sky! Perfect for finding constellations, solar systems, satellites, stars and deep space.