Equipment Instruction Manual Series

AST 205:
Planets in the Universe

Fornax F10 mount

V02, 2012 Oct 1

Figure 1: There are two basic parts: the tripod, and the mount. When you begin, the tripod will be **collapsed** for portability.

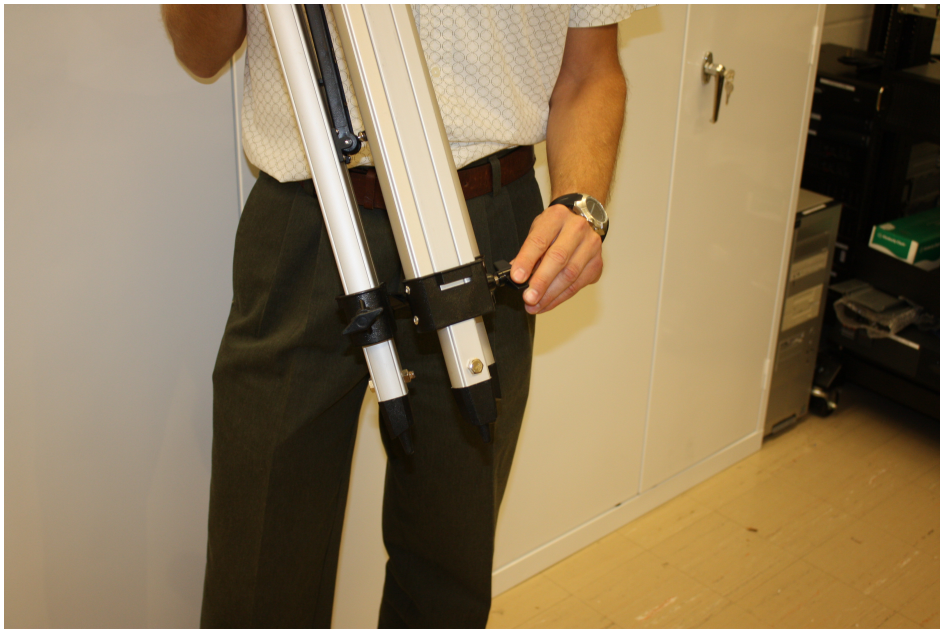

Figure 2: At the bottom of each leg there is a knob. Twist this counterclockwise to **loosen the extension**.

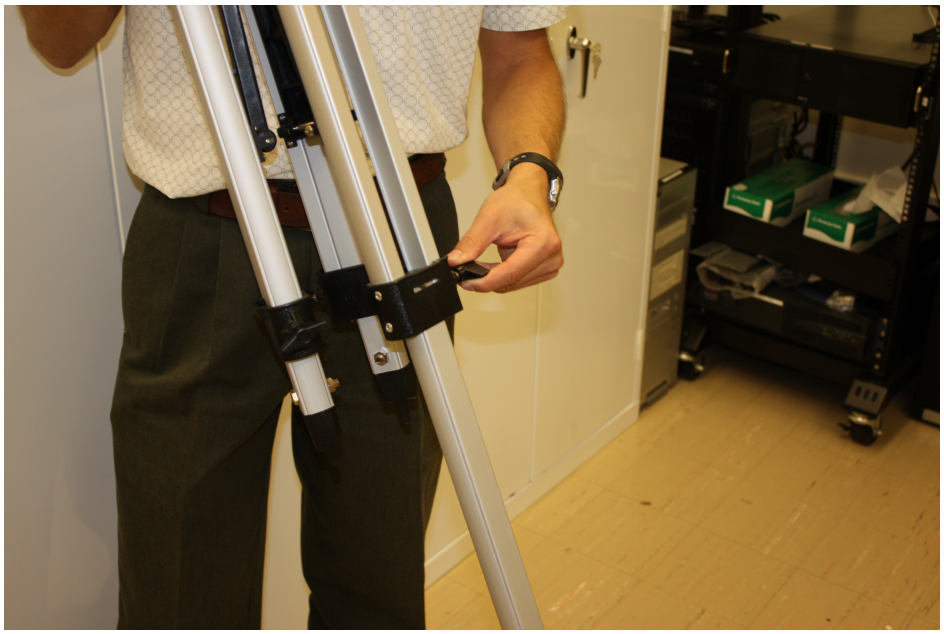

Figure 3: Extend the leg, and then **tighten** it by turning the knob clockwise. Make absolutely sure that the screws are tight.

Figure 4: **Repeat** for all three legs.

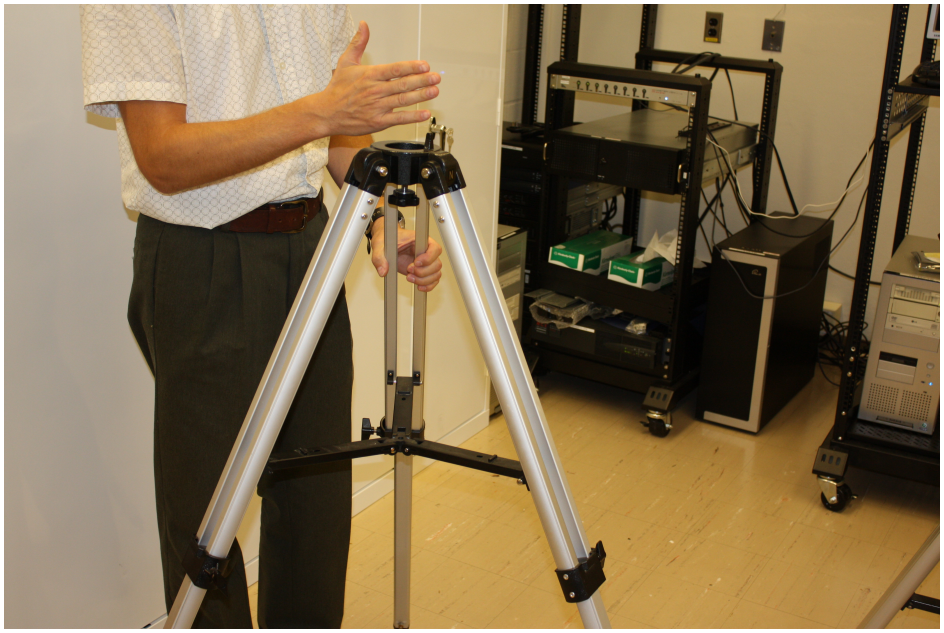

Figure 5: **Open** the legs of the tripod all the way. Since the idea of this mount is that it will track the sky, alignment will be necessary. There is a small protruding feature on the top of the tripod. This should be pointing roughly to the South. In the figure, the professor's hand is pointing **South**.

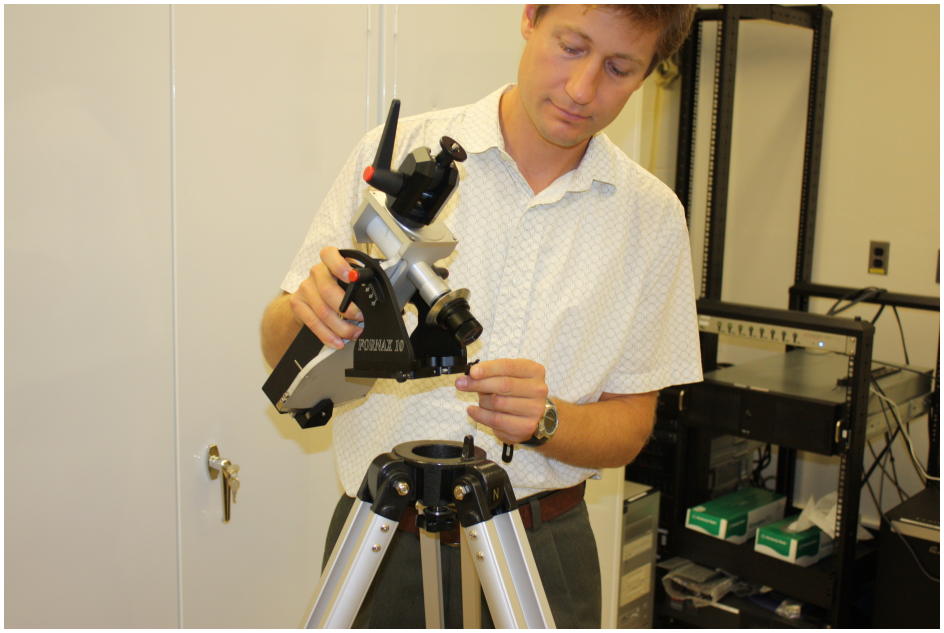

Figure 6: Now attach the **mount** on top of the tripod, as shown. You may need to loosen the side screws to allow it to be placed. The mount changes the axis of rotation from pointing straight up to pointing toward Polaris.

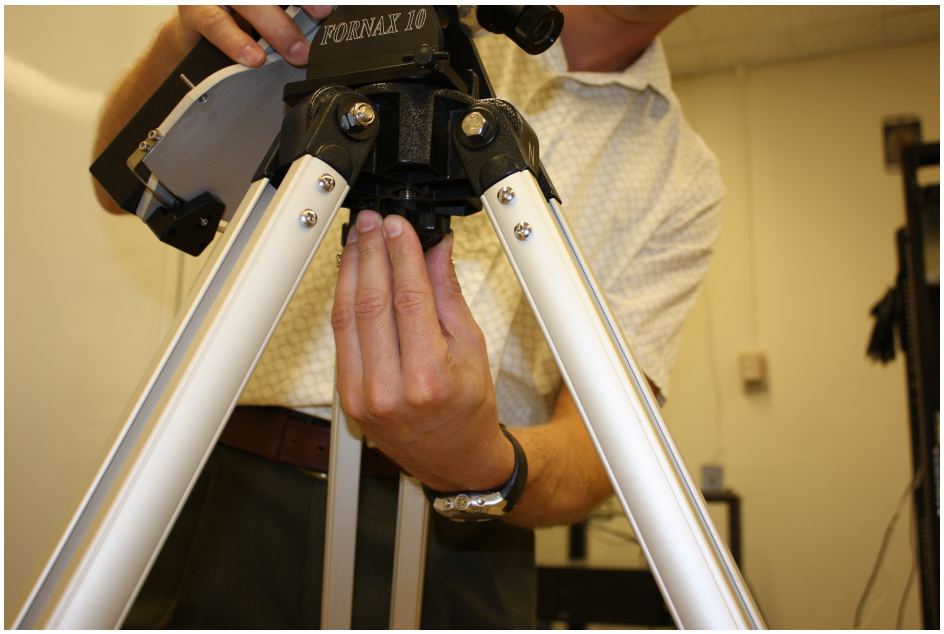

Figure 7: **Secure the mount** by tightening the screw underneath. Like all screws, this tightens by turning clockwise viewed from the back of the screw, but things may seem backward when standing in this position.

Figure 8: Your setup should look like this. The tube through the axis of the mount should point **North**, as the professor is indicating.

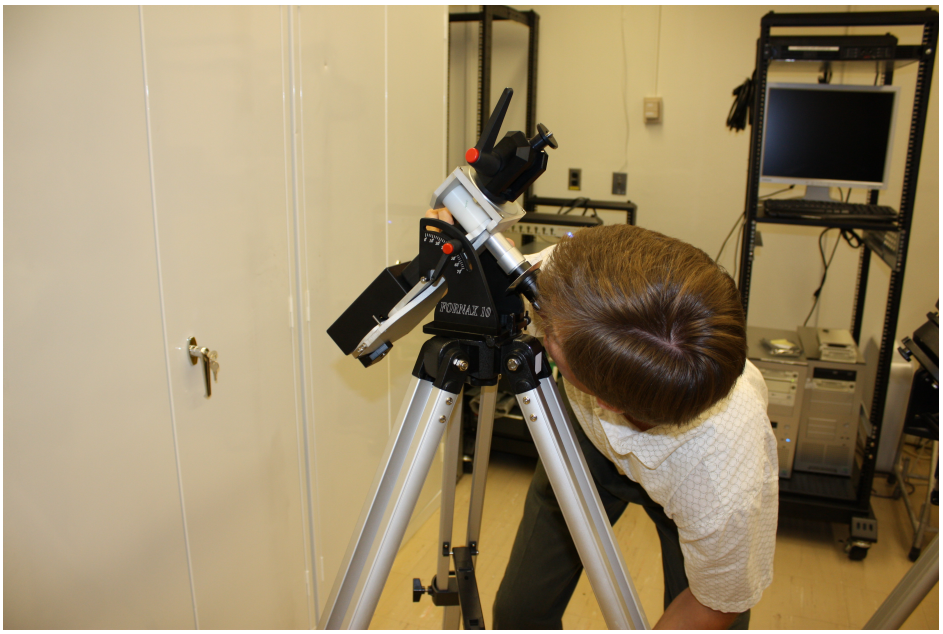

Figure 9: Now for alignment. Look up through the tube in the mount. Your goal is to **center Polaris** centered in the field of view. Your mount may have a small telescope pointing through the axis, in which case you can align Polaris with the open circle (the cross-hairs indicate the true North Pole). You will need to make sure the other stars shown on the overlay are in approximately their correct positions. You can achieve this by rotating the polar telescope. In order to see the overlay at night, you can hold one of the red flashlights near the far end of the telescope to let stray light in the telescope for illuminating the patterns in the eyepiece (such as the cross-hair). If there is no telescope, just center Polaris as best you can in the tube.

Figure 10: There are two locks on the **altitude (up/down tilt) adjustment**, on on either side. The professor is holding one of them. Unlock by turning counterclockwise (they may be stiff). You can move the handles out of the way by raising them and then rotating (think of this as pushing the red button, but instead of it going in, the rest of the handle lifts up. Princeton has a latitude of about $40°20'$ N, so the North Star appears at about $40°20'$ above the horizon. If the top of the tripod is horizontal (which is rarely the case), one would set the mount's altitude to 40 degrees. In practice, you need to perform this so-called polar alignment by looking through the polar axis or polar telescope.

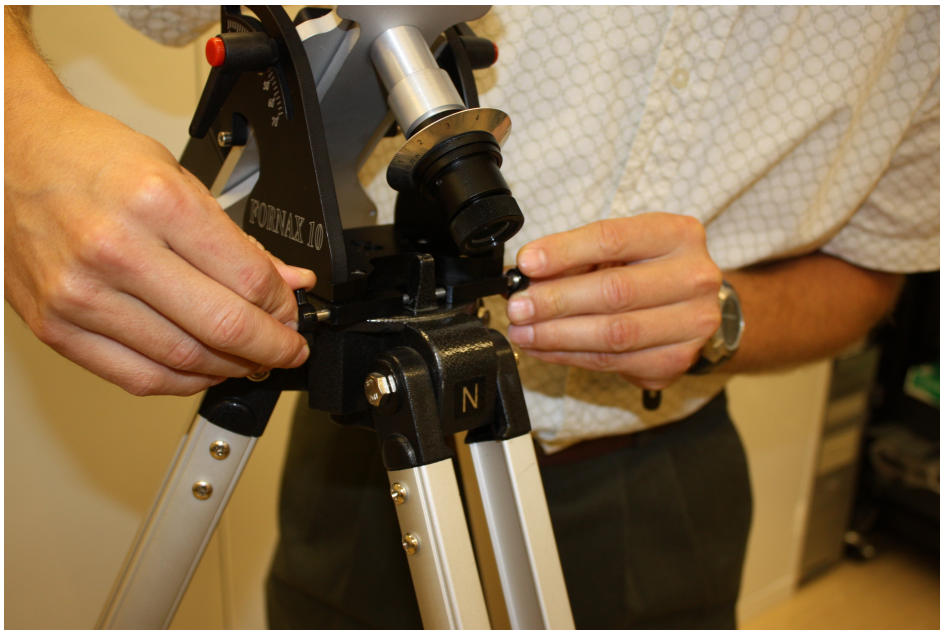

Figure 11: The two small set screws shown are used to make fine **azimuth (left/right)** adjustments. You should already have the legs positioned so that you are close to being aligned on Polaris. Now you can rotate the mount on the mount by loosening one screw and tightening the other.

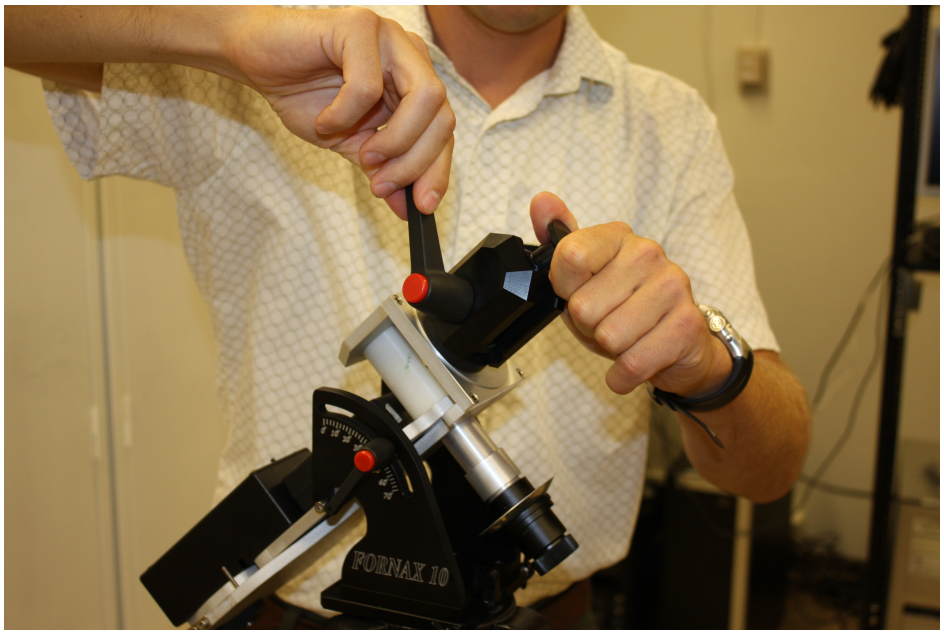

Figure 12: You are now ready to attach the camera. **Loosen the latch at the top** of the mount to adjust the orientation of the joint that will connect to the camera.

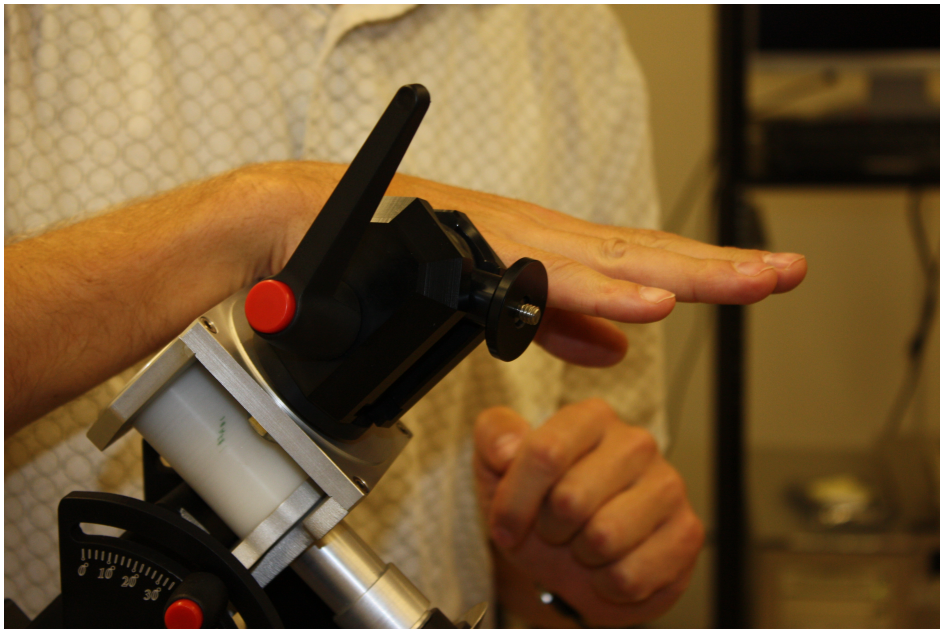

Figure 13: **Set the joint** so that the bolt through its center is horizontal. Be careful not to let the bolt slip out. When you are done, remember to lock the joint in place with the latch.

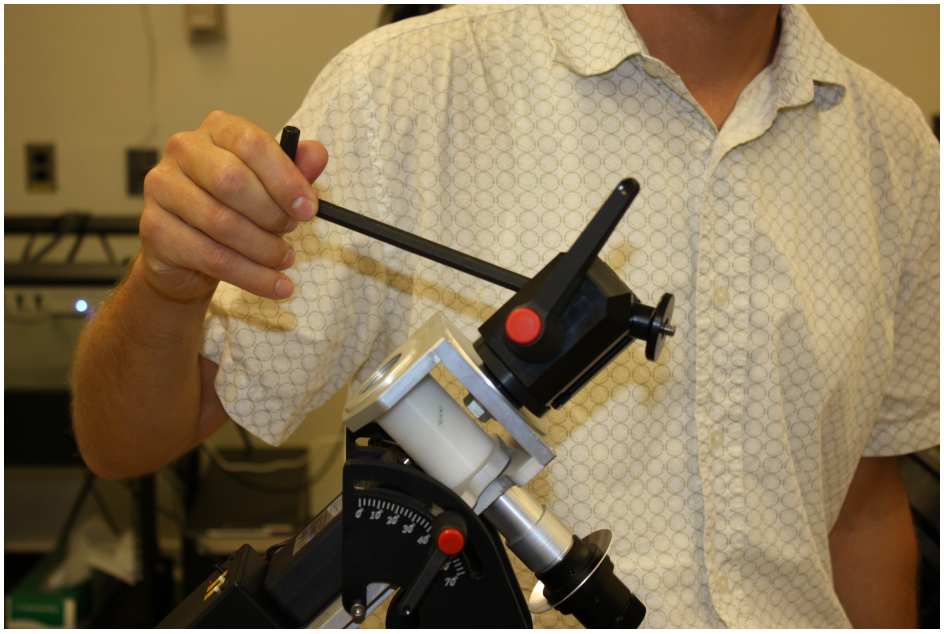

Figure 14: Use the **Allen wrench** on the head of the bolt.

Figure 15: **Attach the camera** by screwing the bolt into the bottom of the camera. Make sure this connection is secure.

Figure 16: The setup should look like this.

Figure 17: **Readjust the joint to aim** at whatever you like. Remember, this is the only way to aim. If you move the tripod or change the mount orientation, you will have to redo the polar alignment. So try to avoid "kicking" in the tripod, or moving its legs in any way.

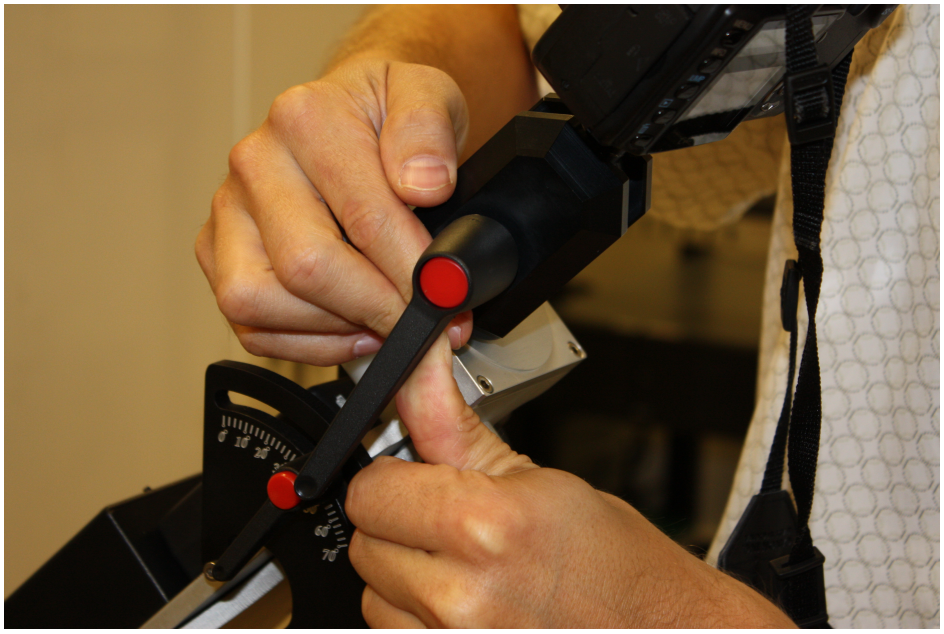

Figure 18: If it is in the way, you can **rotate the latch** to a different position by lifting it away from the tripod and turning it. Think of this as pushing the large red button in the middle of the latch, but instead of the button depressing, the latch will raise up. You can then turn it without loosening the joint.

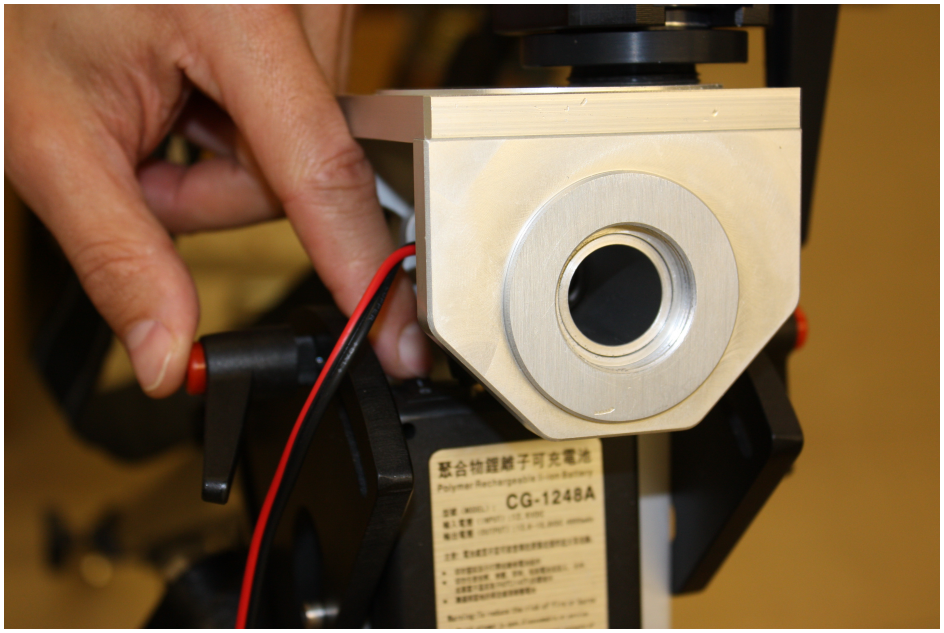

Figure 19: Turn on the **power supply**.

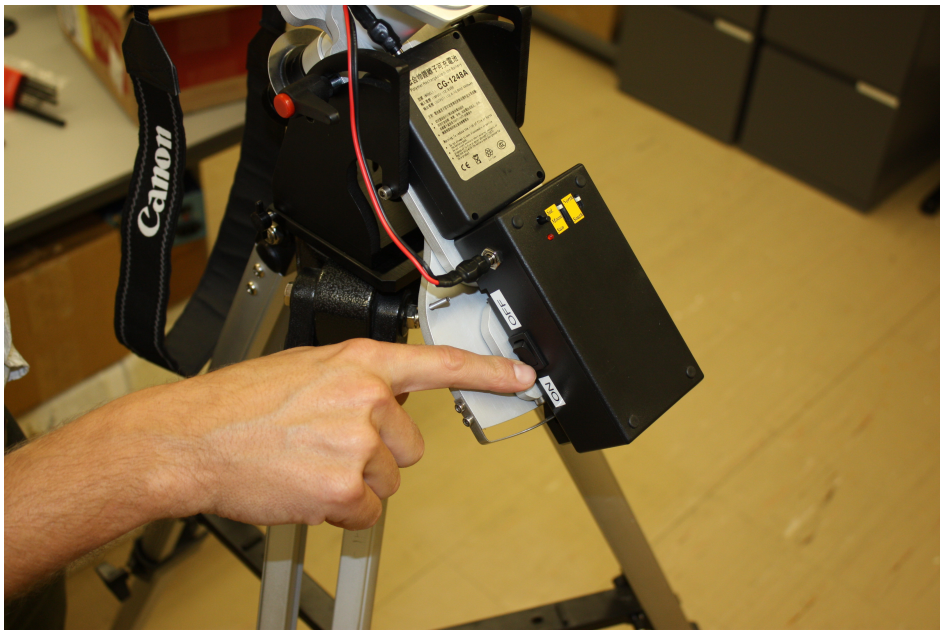

Figure 20: Turn on the **motor**.

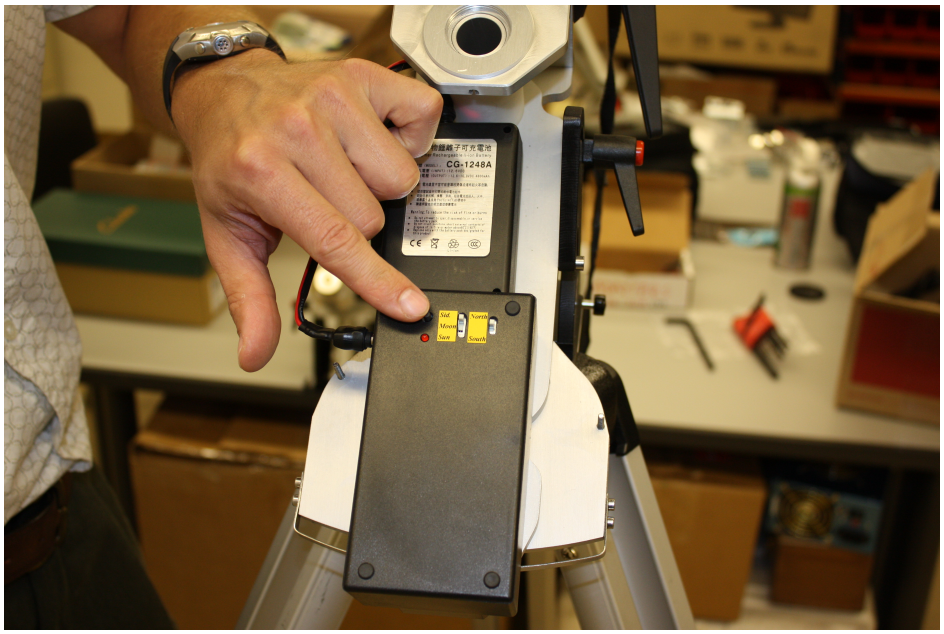

Figure 21: First be sure the white switches are set to "**Sid.**" (**sidereal rate**) and "**North**." The first option will have the mount rotate at just the right speed to keep the stars in the field. The other two settings track the Moon and Sun respectively. The Moon moves slowly enough that a short exposure can be done even in sidereal mode, and long exposures will be washed out anyway. You should **not** try photographing the Sun. The second option tells the mount you are in the Northern Hemisphere. If you switch this to "South," it will rotate the other way and things will streak across the field of view twice as fast as if you didn't have the motor running at all. (This can be used to get star trails in half the time.) At this time you should make sure there is clearance for the two screws sticking up out of the plate. They prevent the assembly from rotating too far. Over time the plate with the screws will move from right to left with respect to the motor in this picture (assuming "North" is selected). You can simply turn off the motor (OFF switch), and gently push the plate to reposition it. **After** all these settings, engage the motor by pressing the black button the professor is touching just once. The drive will make noise if working properly. See the appropriate camera guide for instructions on taking photographs.