YALE ARCHITECTURE

HELIODON

SETUP AND USER GUIDE

SETUP - OPERATION

Sun Setting

Turn the **spotlight (Sun) ON** and set it to **100% power** using the control box mounted on the wall.

- Flip the toggle switch to **“ON.”**
- Use the control knobs to adjust **power** and **color temperature**.

Note: For greater accuracy, research the typical color temperature (K) for the time of day, season, and region of your study, and set the spotlight accordingly. The control box allows you to simulate conditions from sunrise to sunset, enhancing the realism of daylight quality in your studies.

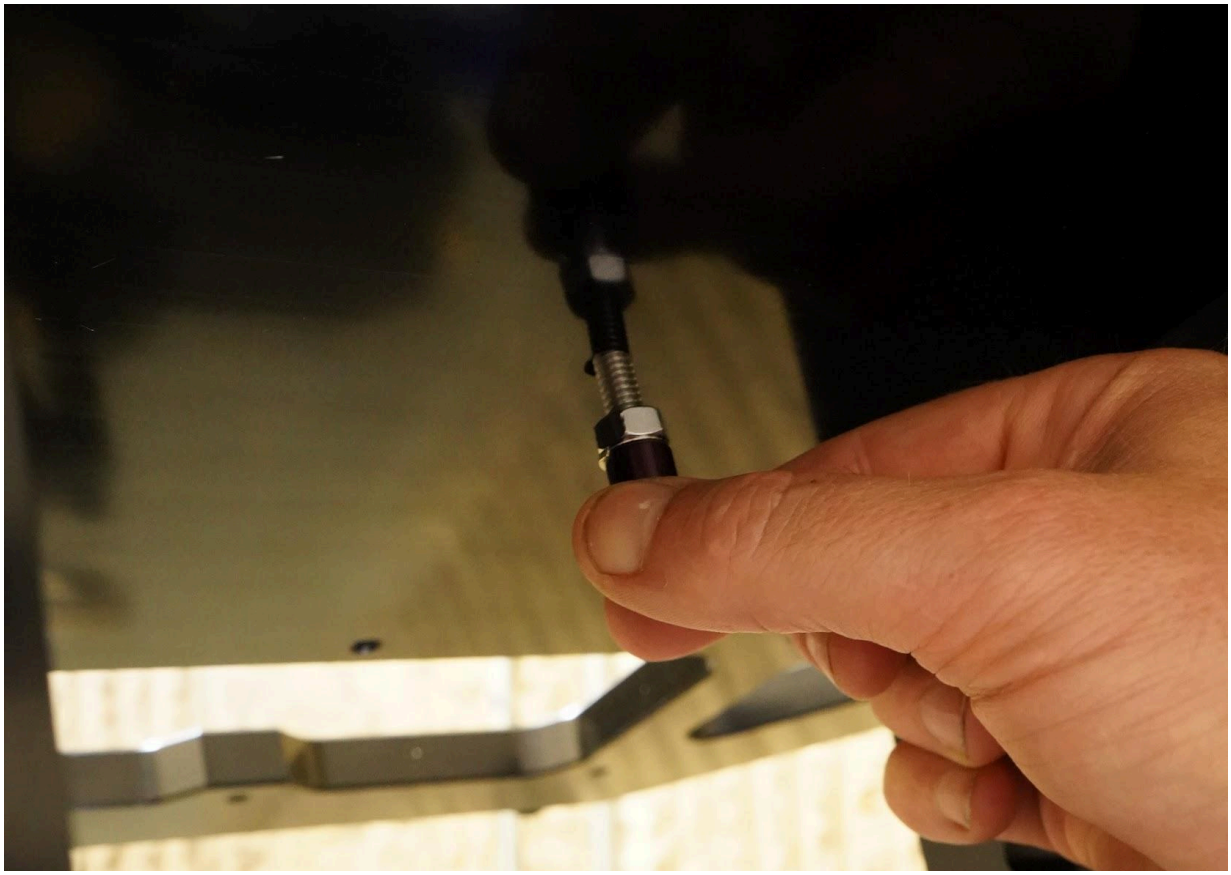
Calibration Awareness

As soon as you enter the heliodon room, you should confirm that the system is properly calibrated. The heliodon can be bumped or shifted out of alignment, so always check before use. This can be done using the **shadow guide plate** and its **accompanying pin**.

Note: The pin is **only** for calibration and for observing shadow patterns on the shadow guide plate. **It is not for attaching or anchoring your model.** Always lower the pin before placing a model on the table. Forcing a model onto the pin can damage the equipment.

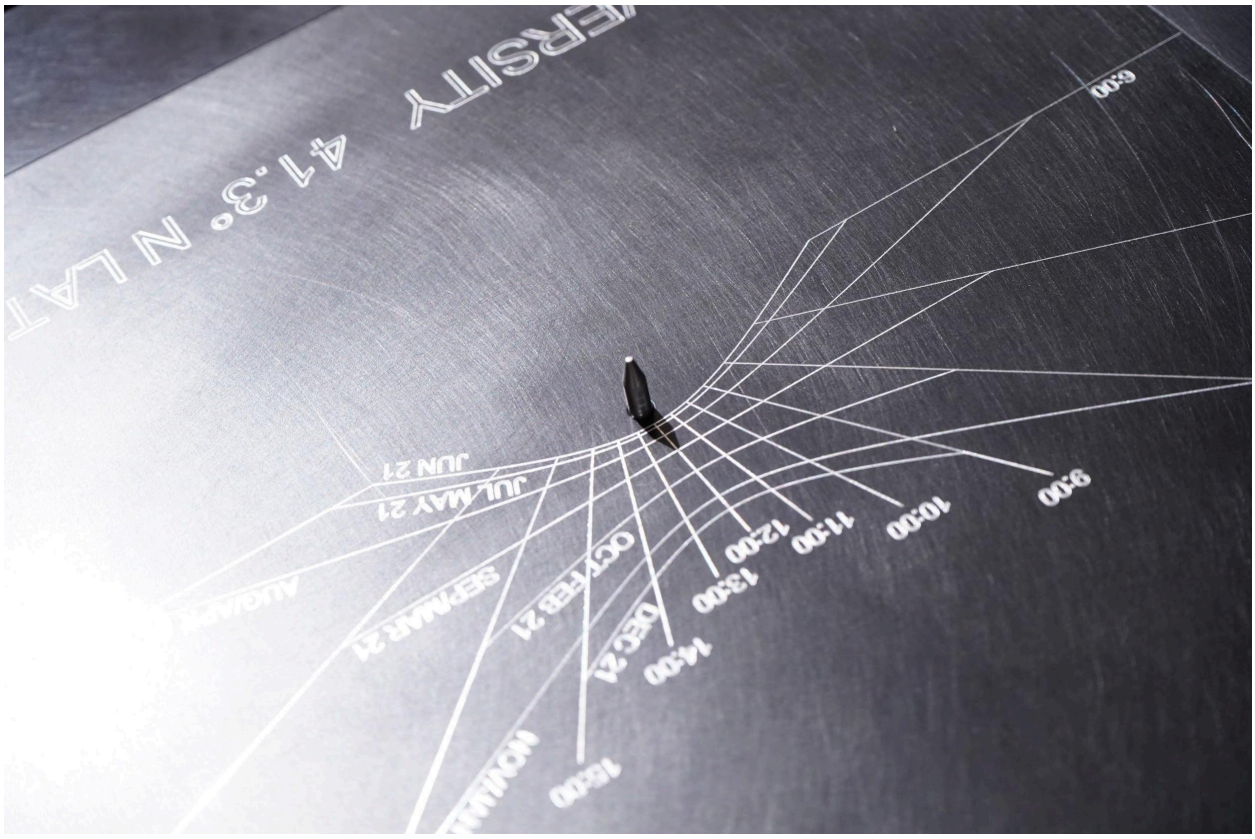
Step 1

Loosen the **silver hex nut** by turning it away from the underside of the table. Tighten it against the **silver washer** as shown in the diagram.



Step 2

Once the hex nut is finger-tight, turn the **black thumb screw** all the way up into the table surface to lock it in place. As you tighten, the **shadow-casting pin** will extend above the table surface.



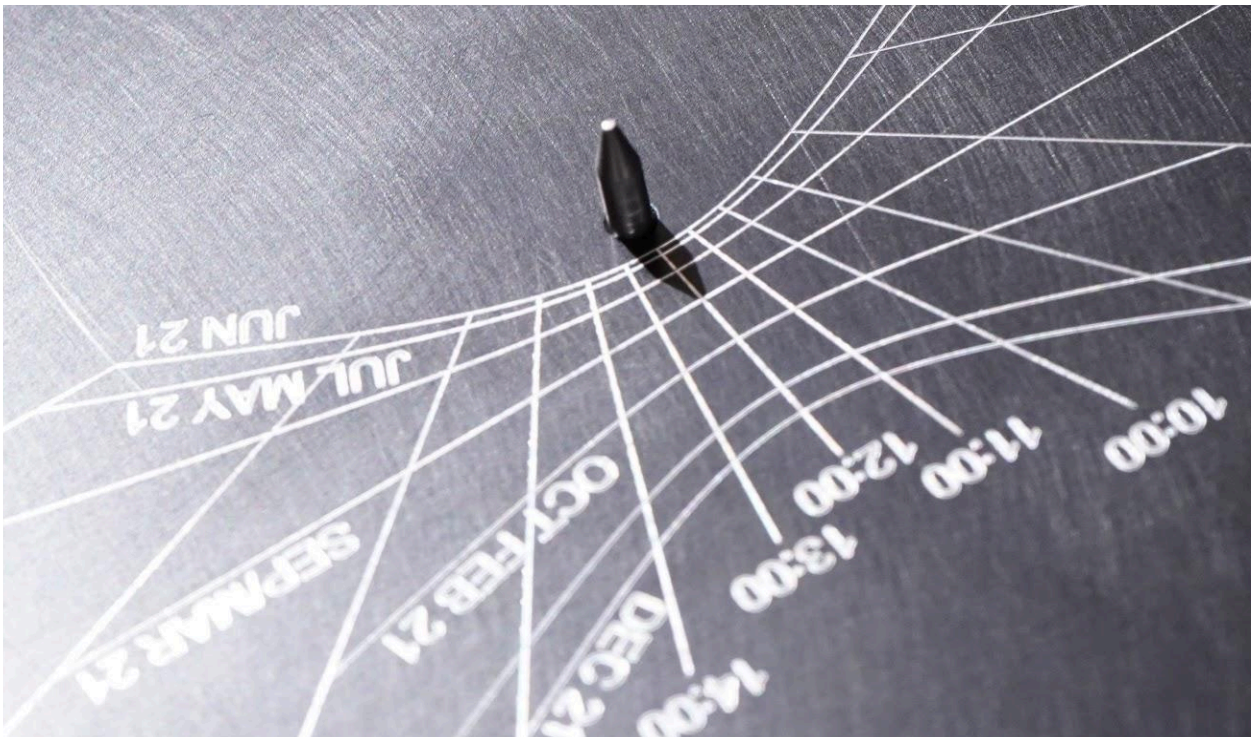
Step 3

Time-of-Day Check:

- Set the **Time-of-Day handwheel** to **12:00 noon**.
- Look at the **shadow guide**: the pin's shadow should fall exactly on the **noon line on** the shadow guide plate.
- If the shadow falls anywhere else, the heliodon has shifted. Do **not** attempt to fix it yourself and submit a **Zendesk ticket** to **Advanced Technology**.

Seasonal Check:

- With the Time-of-Day still at **noon**, set the **Seasonal Tilt** to **Sept/Mar 21 (equinox)**.
- The tip of the pin's shadow should fall exactly on the cross section of the noon line and line labeled **"Sept/Mar 21**.
- If instead it shows another date (e.g., October 21, November 21), the heliodon is out of calibration. Submit a Zendesk ticket to Advanced Technology.



Model Preparation

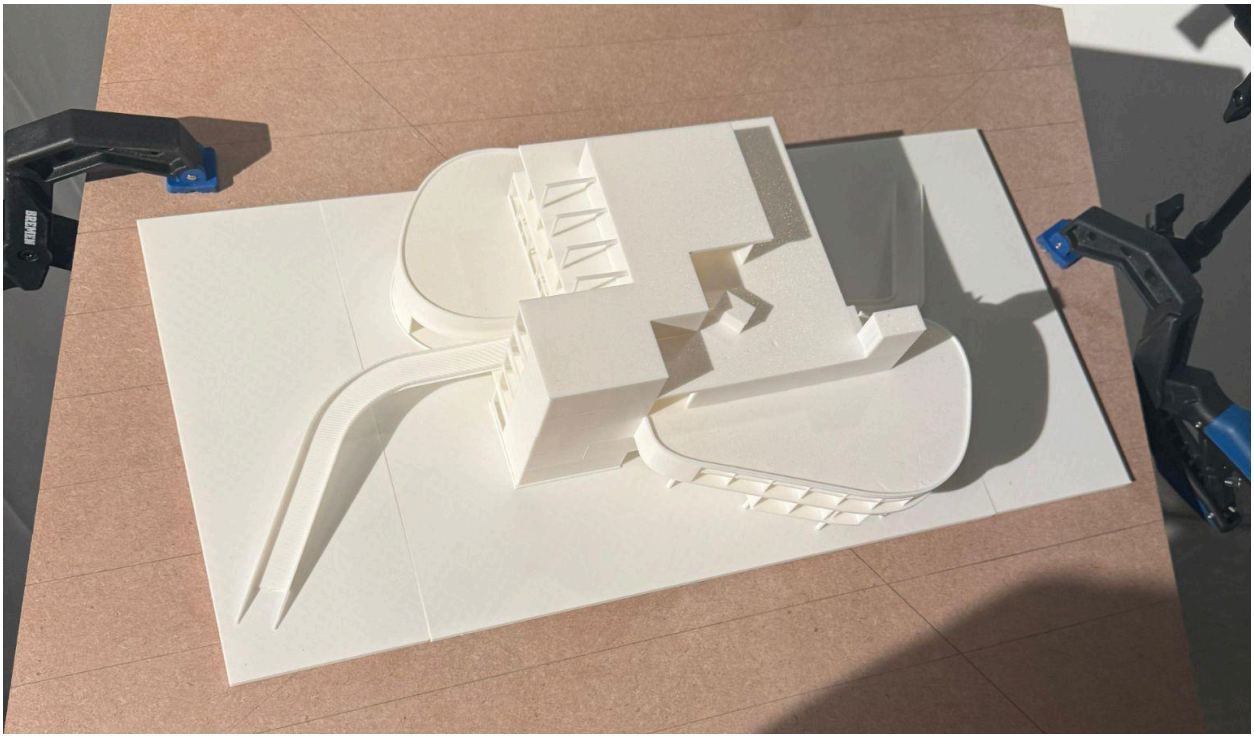
Before using the heliodon, ensure your model is properly prepared. It must be sturdy enough to be held upside down without any loose parts. The north–south orientation should be clearly marked.

Note: For models located in the **Northern Hemisphere**, north is oriented away from the "sun" and the user. For **Southern Hemisphere** latitudes, south is oriented away from the "sun" and the user.

Model Placement

- Loosen the **silver hex nut** beneath the heliodon table to lower the **pin** on the shadow guide plate.
- Construct a 24" × 24" base from a sturdy board (cardboard, plywood, etc). This base will carry your model.
- Place the model base parallel to the registration lip at the lower edge of the table. The edge that is opposite to the registration lip represents True North (or True South, depending on the hemisphere setting).
- Position your model as close to the center of the base as possible. Because the illuminated surface area is limited, centering ensures the study area receives the maximum and most even light coverage.
- If your Magnetic North (Project North) differs from True North, orient and attach your model on the base at the correct angle so that Project North is aligned to True North in the heliodon.
- Use the provided thumb screws through punched holes in the base to secure your model, as shown here. If it is difficult or undesirable to drill holes in the model base, the model can be clamped to the table surface, as shown here.
- If your model base is larger than the table, the raised registration lip can be lowered by loosening the two thumb screws that hold it in place.

Note: The table holes are threaded ¼”-20, allowing them to be used with the provided thumb screws or with flexible camera mounts if desired. While camera mounts can be placed here, the threaded holes around the table perimeter are often more convenient for this purpose. The holes are arranged in an even 5” grid across the table surface. For stability, use at least two holes in your model base, positioned to both clamp the model securely and keep it correctly oriented to North or South.



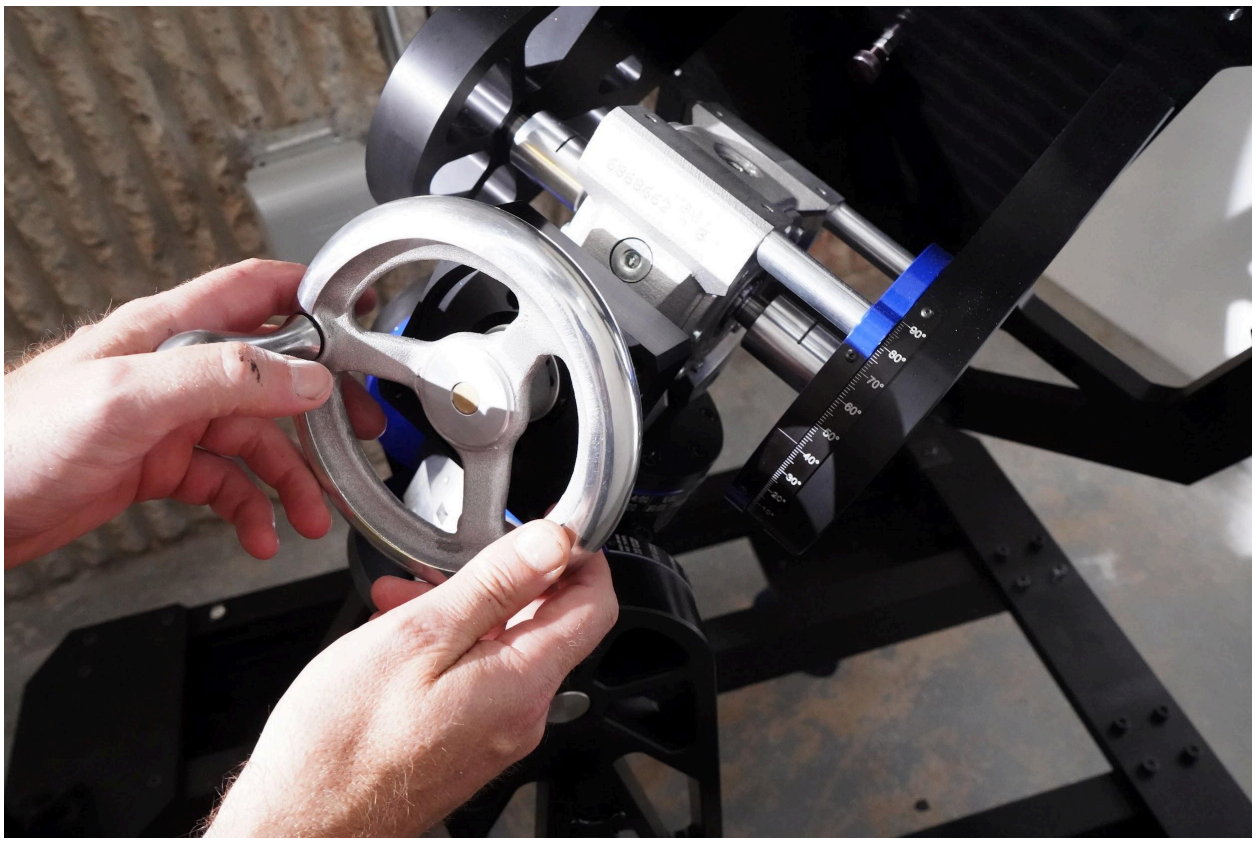
Hemisphere Setting

Setting the hemisphere correctly is essential for the accuracy of the simulation.This ensures the heliodon simulates the correct solar geometry for your project location.

- First, identify whether your project site is in the Northern or Southern Hemisphere.
- Then switch the heliodon to the appropriate hemisphere mode.

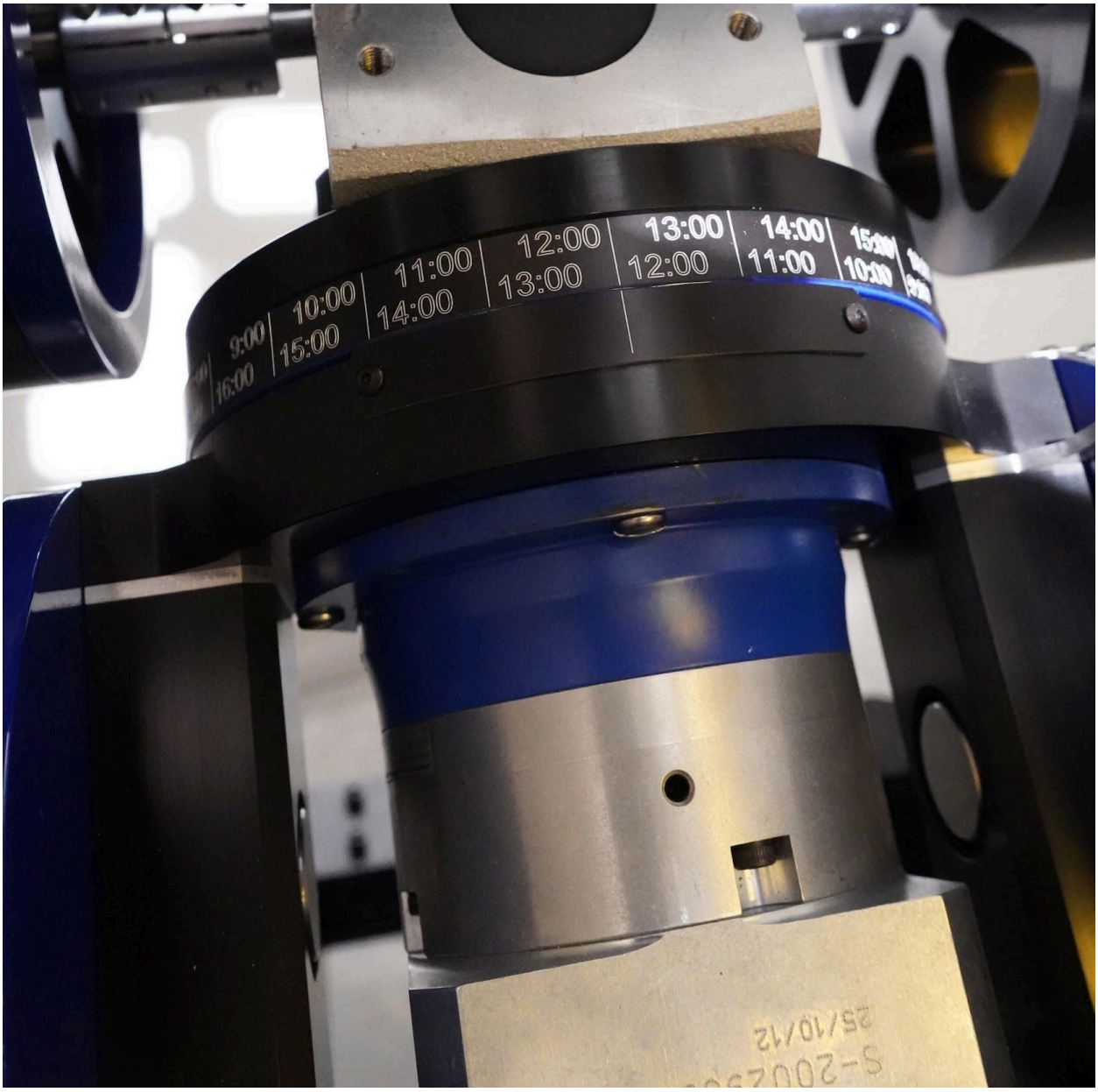
Step 1

Turn the **Latitude wheel (rear handle)** to the angle engraved on the installed shadow guide (**Yale – 41.3°**).



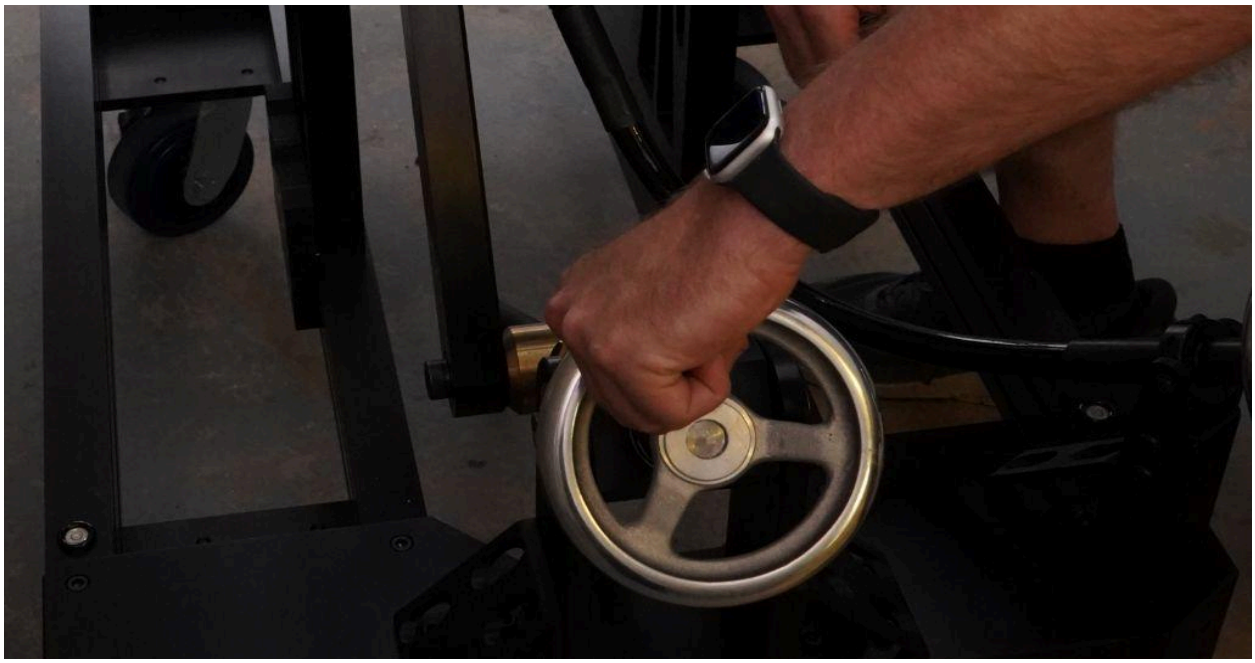
Step 2:

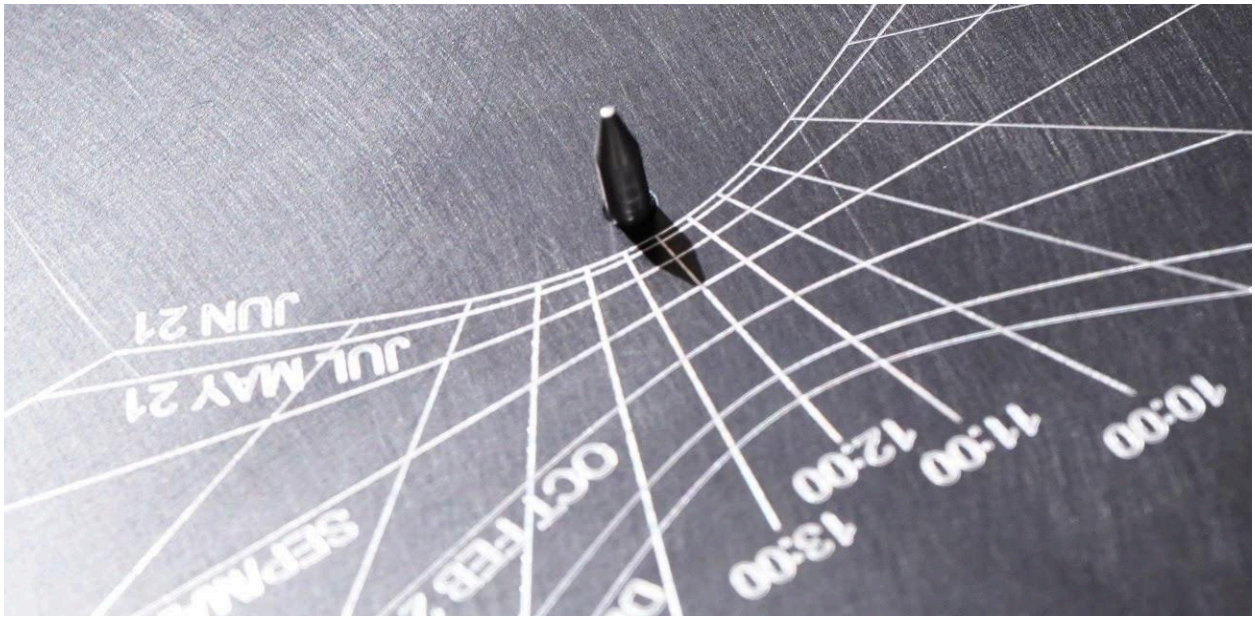
With the **latitude position** set to match the tabletop shadow guide, set the **Time-of-Day handwheel (corner handle)** to **noon**.



Step 3

Then rotate the **seasonal tilt handle (front-and-center handle)** until the tip of the pin's shadow falls exactly on the crossing line labeled **"Sept/Mar 21."**



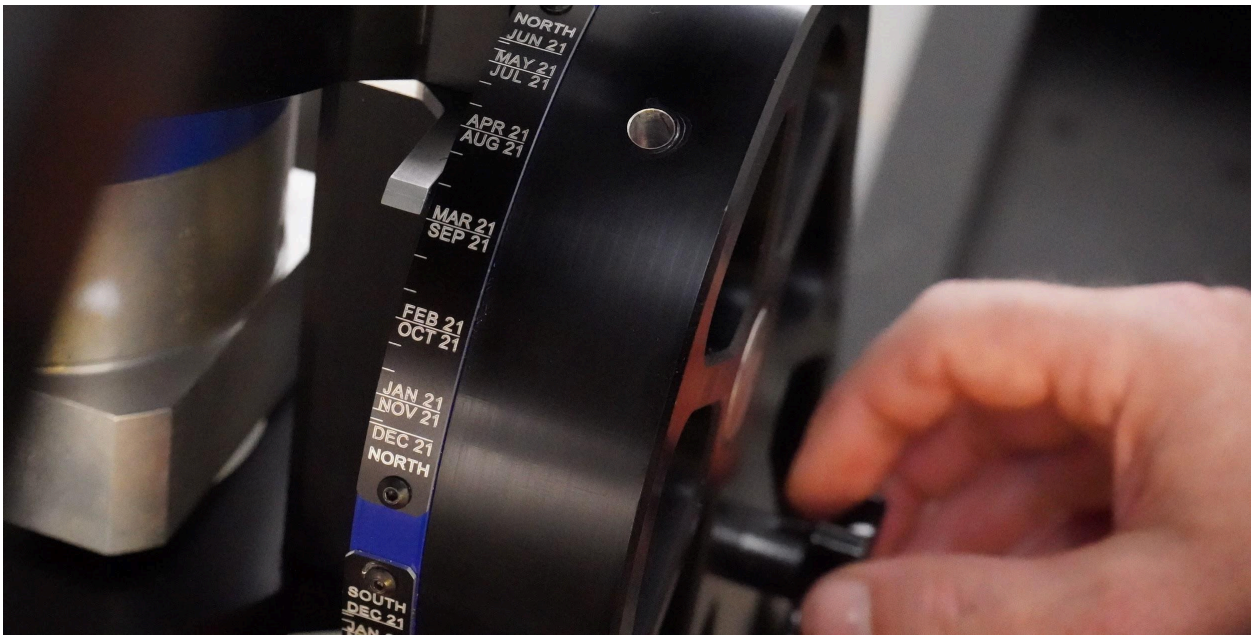


Step 4

Once this is set and verified, **loosen the black brake handle** on the near support leg.

Step 5

Spin the **blue season wheel**, which contains both a **North** and **South gauge**, to the **MAR/SEP 21** line on the appropriate hemisphere gauge (e.g., **North**, as shown in the image below). Align the mark with the **sharp edge of the silver marker** just inside the disk, then **lock the brake** again.



Observe: You can observe the difference in shadow length between hemispheres by setting the Time-of-Day handwheel to noon and adjusting the season wheel through the months, while observing the shadow projected from the pin on the shadow guide plate.

Remember: Summer occurs in December in the Southern Hemisphere and in June in the Northern Hemisphere. At noon, the sun's height creates opposite shadow patterns in each hemisphere. In the Southern Hemisphere, shadows are shortest in December (summer) and longest in June (winter). In the Northern Hemisphere, shadows are shortest in June (summer) and longest in December (winter).

How to Use the Heliodon for Daylight Study: Basic Principles

The heliodon is built around **three axes**, each simulating a different aspect of the **sun–earth relationship**. For most use cases, **you will want to set a Latitude and Month, then study daylighting from sunrise to sunset.** You may also find it interesting to set the time at noon, and move through seasons or latitudes to better understand the effects of all solar variables.

Latitude – **The rear handle** tilts the **table surface** to the desired latitude. This adjustment is the same for **North or South**, as the system uses **mirrored latitudes from the equinox (0°)**.

<u>Season</u> – The **front-and-center handle** controls the **Seasonal Tilt axis**, moving between the extremes of the **solstices (June 21 and December 21)** and the midpoint of the **equinoxes (March 21 and September 21)**.

<u>Time of Day</u> – The **corner handle** rotates your model through a full day, from **sunrise to sunset**.The guide has two rows of times, the **lower row** is for the **Northern Hemisphere** and the **upper row** is for the **Southern Hemisphere**. Turn the handwheel **clockwise** for Northern Hemisphere locations and **counterclockwise** for Southern Hemisphere locations.