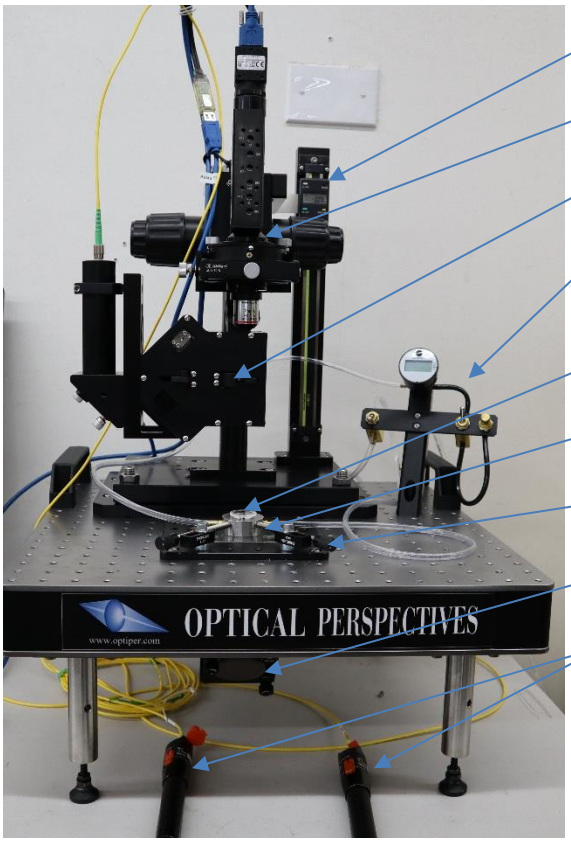
Introduction of the Optical Perspectives Manual Centering Station



Digital height gauge

Point Source Microscope (PSM)

Axis Finder Module – Reflective optics version

Vacuum controls for chuck and lens

Lens being centered

Vacuum chuck or seat for lens

Adjustment screws for centering lens chuck

Bessel beam projector under breadboard base

Battery powered fiber light sources for transmitted and reflected Bessel beams

The Manual Centering Station uses a Bessel beam projected from under the breadboard base as the reference axis to which the doublet halves are centered. The Axis finder module splits the beam into two paths to the PSM, one longer than the other. When the Bessel beam is misaligned due to tilt and/or decenter of the lens, two decentered Bessel beam core spots appear on the PSM display. When the two spots are both centered on the PSM crosshair, the lens is free of tilt and decenter. When centered, the Bessel beam angular deviation through the lens is < 2 arc seconds.

First, the meniscus element is centered on the vacuum chuck. This requires both rolling the lens in the chuck seat and centering the chuck. Once the meniscus lens and chuck are centered, the chuck is held in place with one vacuum line and the lens with the other vacuum line. Then cement is added, and the positive element is inserted and centered until the transmitted Bessel beam is again centered on the crosshair. The cement is then set with a UV gun. All this is done without a rotary table or the need to move the PSM/Axis Finder Module. Further, once the chuck is initially centered, it is ready for the next meniscus without the need for further adjustment.

The explanation of how the Axis Finder Module works is found in the paper “Practical considerations…” found on our website at
https://www.opticalperspectives.com/category/published-papers/page/2/

There are also videos showing centering, but not yet with this new method with the Axis Finder