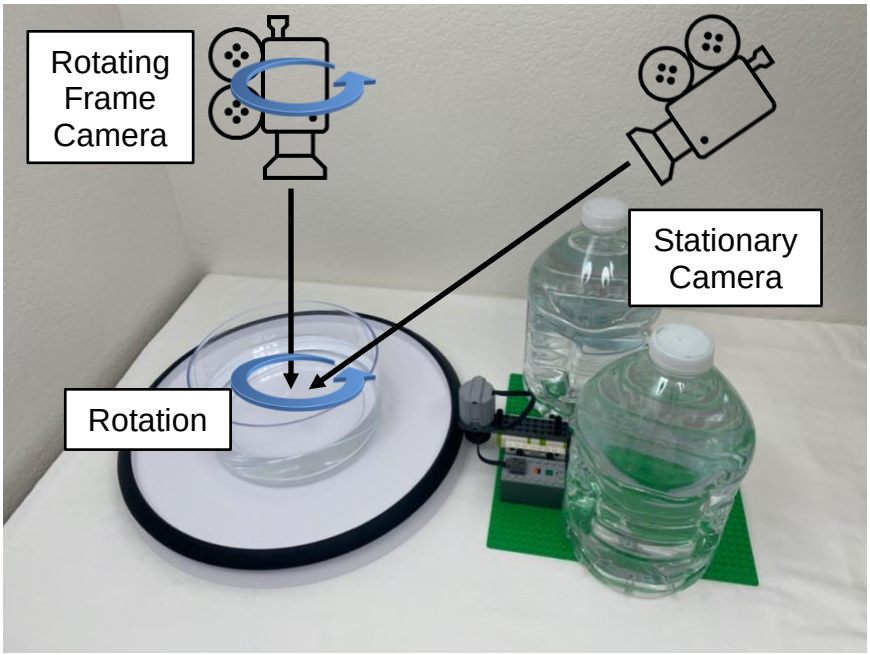
Setting Up the Rotating Frame Camera Mount

Method developed by Marianna Linz (https://eps.harvard.edu/people/marinna-katherine-linz).

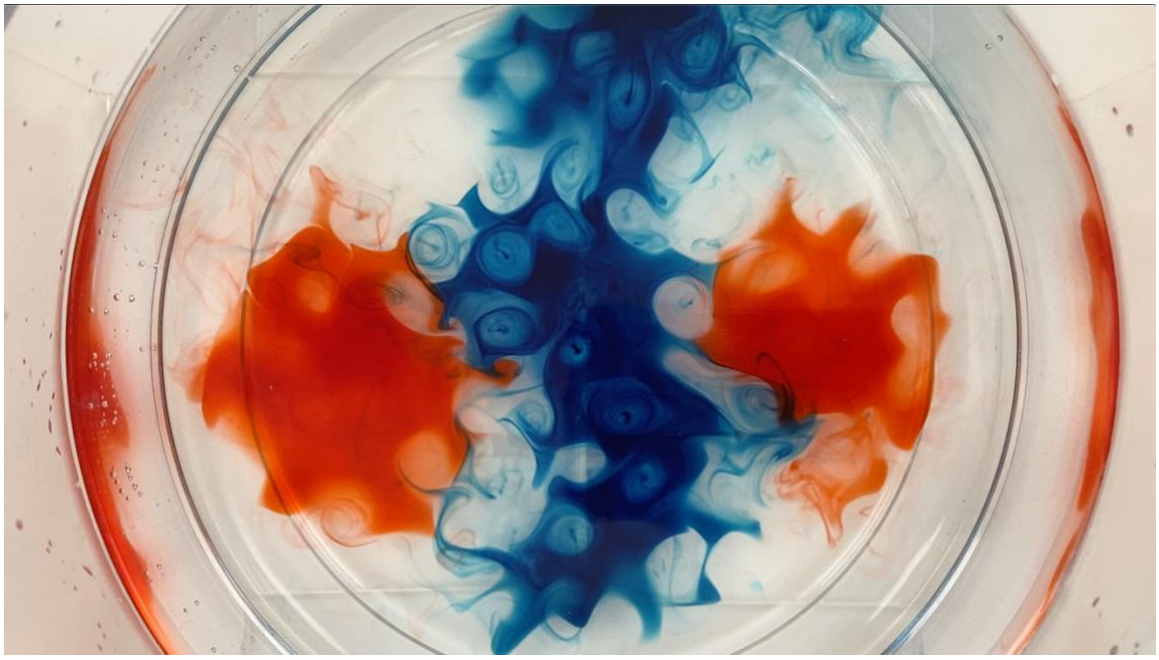
This document describes the steps to set up the rotating frame camera mount. The DIYnamics Technics Table models the impact of rotation on fluid dynamics. Rotating tank experiments, representative of the behavior of planetary fluid bodies, enable audience members to take a hands-on role in observing and analyzing fluid motions.

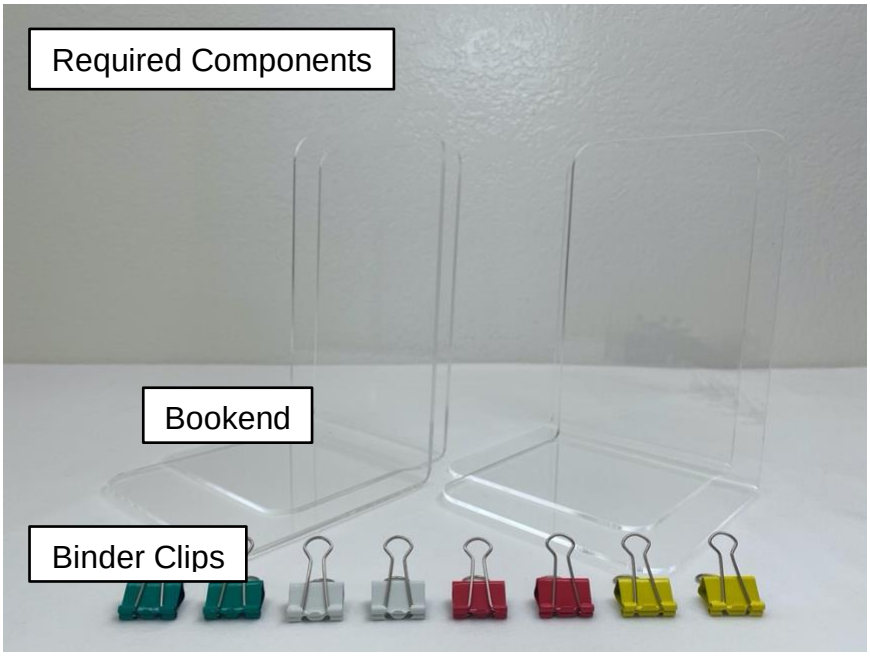
The goal is to observe the behavior of water in rotating tanks. The rotating frame refers to the perspective of a viewer on a rotating body as it rotates. The stationary frame refers to the perspective of a viewer outside of a rotating body watching it rotate. It is difficult to observe the behavior of water in rotating tanks from a stationary perspective because fluid motions are confounded by the tank's rotation.

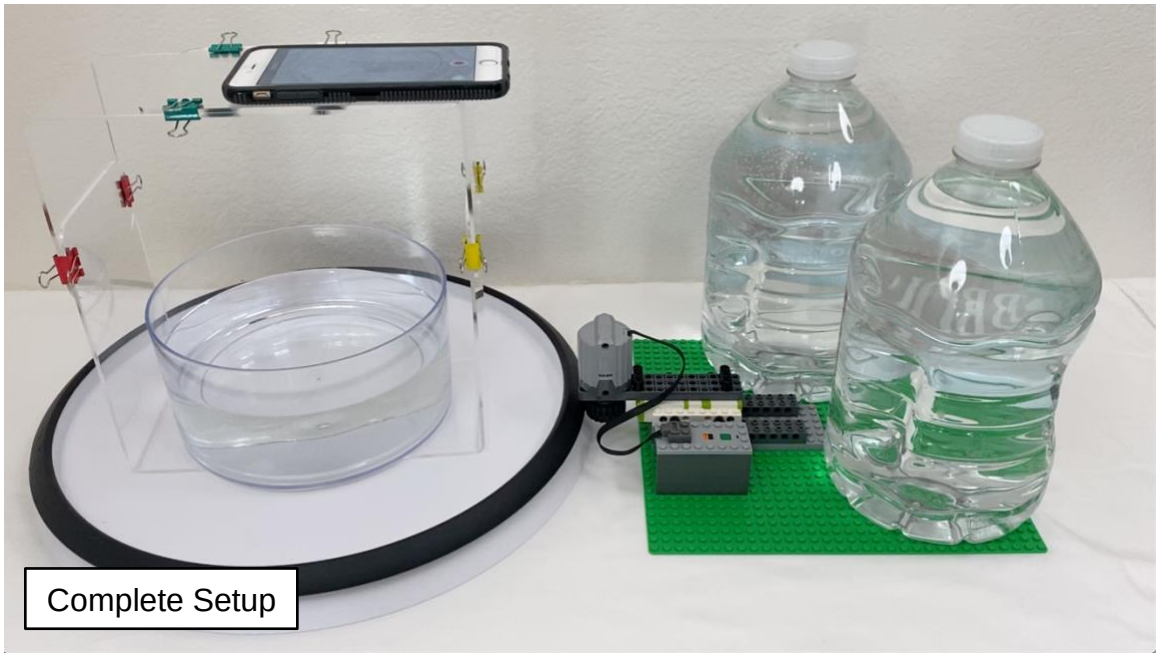


To this end, to gather data, we mount a camera in the rotating frame. The camera, affixed to the turntable and positioned above the tank, rotates with the tank as the turntable is driven. In this way, we can observe how fluid behaves as if we were inside the system.

Footage of convection captured in the rotating frame.

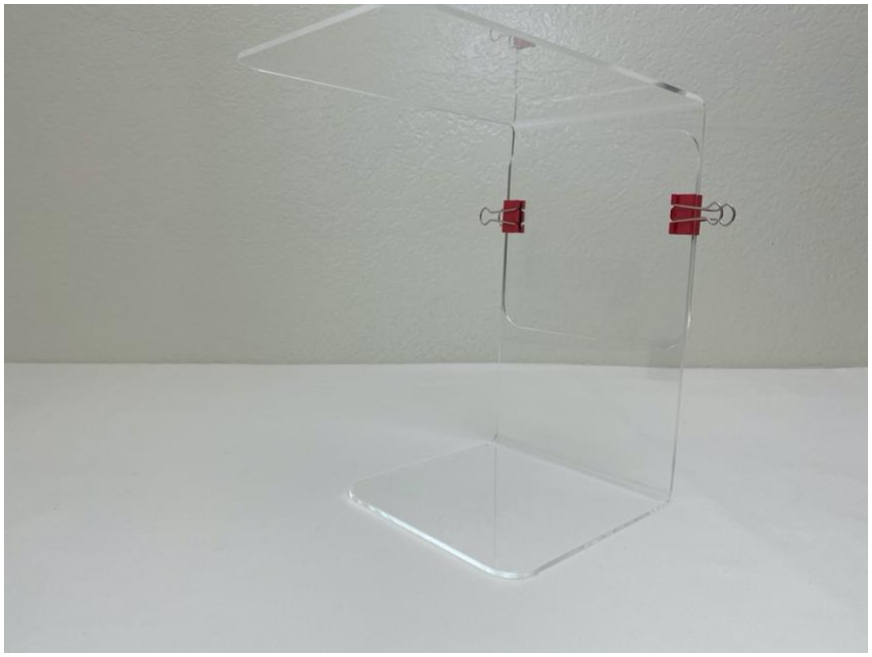




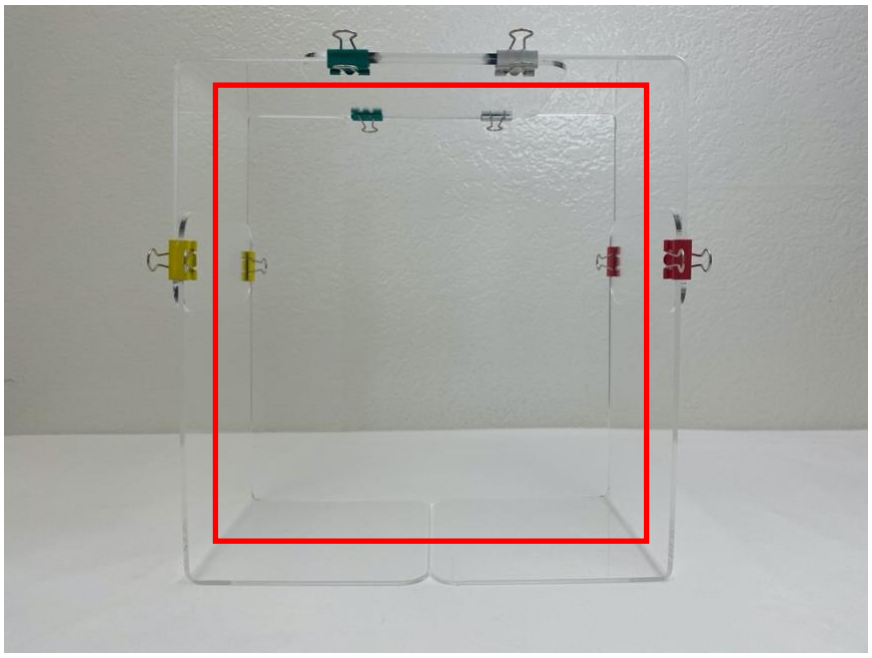


Complete Setup

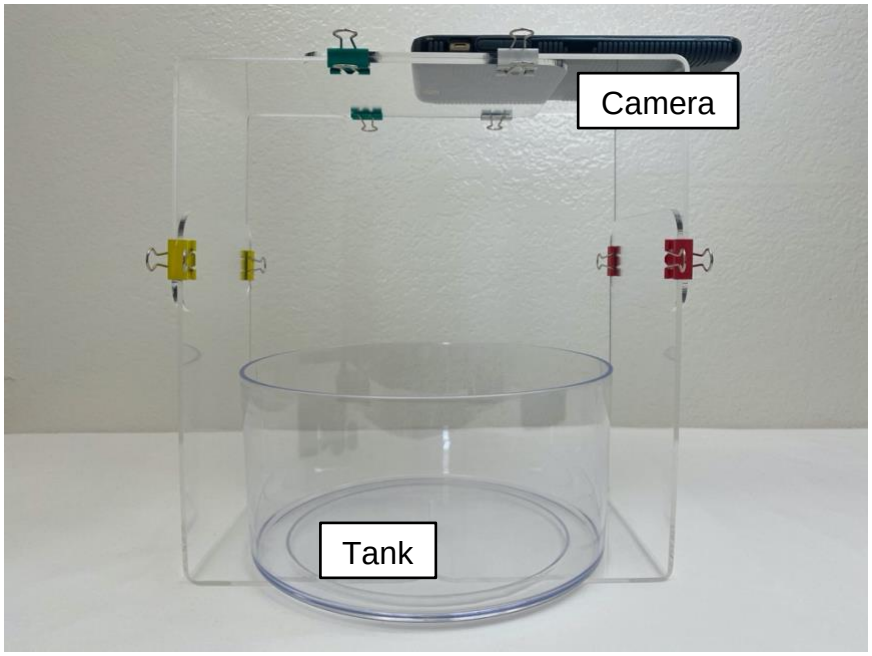
Step 1: Connect Bookends together with Binder Clips.



Step 2: Arrange Bookends in a rectangular structure.



Step 3: Place the Tank inside and the Camera atop the rectangular structure. If necessary, adjust the rectangular structure to ensure that the Tank fits inside and the Camera can capture its contents.



Step 4: Capture footage via the Camera. An interesting option is to livestream footage from the Camera to a separate device enabling audience members to observe fluid motions in real time. Options include using Zoom (highlighted in the Zoom Livestreaming Guide) or GoPro livestream capabilities.