

Building a "Planktoscope" Plankton Imager

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Plankton are responsible for producing the majority of oxygen on Earth, so their health and the health of our climate are closely related. This makes monitoring local plankton communities an important part of climate science. "Planktoscope", a project based out of Stanford University, has produced an open design for a plankton imager that is affordable and relatively easy to construct. The goal of this "Planktoscope" project is to put sophisticated scientific equipment in the hands of dedicated citizen oceanographers across the globe to allow the widespread collection of plankton community data. I was awarded URI's Undergraduate Research Grant and support from my lab to construct one of these imagers and test its capabilities. Over several months, I put it together using acrylic parts I laser-cut on campus as well as a soldering station to help wire the computer components. After some troubleshooting, we had an operable plankton imager constructed for around \$800, compared to the tens to hundreds of thousands of dollars that plankton imagers typically cost. After testing the imager using library cultures of plankton that our lab maintains, I was able to bring it aboard URI's R/V Endeavor for some field-testing during the 2021 NES LTER Summer transect cruise. The imager performed flawlessly, capturing hundreds of images of plankton sampled using a bongo-net system. This condensed sample of plankton provided insights into the biodiversity of plankton observed in this area. Since the cruise, the imager was brought to "Science Saturday", an open-house at the GSO. Many interested people stopped to watch Narragansett Bay plankton swim past the camera in our live-feed from the imager. Increasing public awareness for our coasts, ecosystem and climate is supported by this imager.