

THE FLAMINGO PROJECT MAKES CUSTOM LIGHT SHEET MICROSCOPY MORE ACCESSIBLE

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Whenever a new microscopy technology gets presented, researchers want to evaluate and use it for their own imaging ideas: They can collaborate with the inventor, try to build their own copy or wait until it becomes available commercially or in a nearby core facility. However, all of these solutions have their drawbacks, and it may take a long time until the ideal solution is found. The goal of our Flamingo project is to build shareable, modular and mobile light sheet microscopes to unlock exciting new imaging experiments in research laboratories. Each Flamingo microscope is tailored for the specific specimen and application to provide the best possible instrument for the collaborator, resulting in unique image data. Potential light sheet microscopy users can test the technology for their specific research question before fully committing and building their own microscope or buying a commercial setup. By using a Flamingo, scientists get first results very quickly, which is particularly useful for high-risk experiments, newly established laboratories or grant applications, among others [1].

During the design process we wanted to create a microscope that packs all the optical performance of our existing, stationary light sheet microscopes into a compact, modular and portable framework. We have now developed a robust, proven platform to build a variety of microscopes. We collaborated with developmental biologists in several institutions who always wanted to try light sheet microscopy. The microscopes performed very well with a variety of biological samples, including zebrafish, worms, and plants, even in long time-lapses. The results are on par with images recorded on our well-proven, but complex and stationary microscopes. The entire setup fits in two roller cases and can be moved from lab to lab, packed in the trunk of a car, and shipped over long distances.

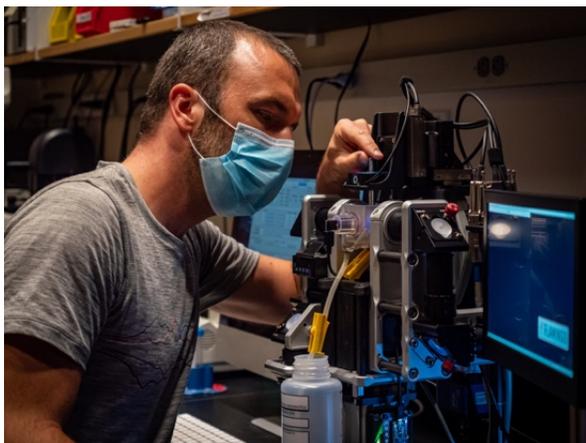


Figure 1: Researcher working on a Flamingo light sheet microscope

Our Flamingo (www.involv3d.org) is also a great tool for microscopy and biology courses as it is more accessible than the typical “black box” commercial microscope and is thus well suited to teach the principles and concepts of light sheet microscopy. We as the developers benefit from the Flamingo by learning about exciting imaging projects, getting access to new specimens and integrating user feedback to build more useful instruments. We see large potential in expanding our concept to areas beyond light sheet microscopy, and we would be happy to get new partners on board to push these ideas forward.

[1] Power, Rory M., Jan Huisken. 2019. “Putting Advanced Microscopy in the Hands of Biologists.” *Nature Methods* **16**, 1069.