

Innovative, Interdisciplinary Tools to Study Marine Animals in Our Changing Ocean

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Although an abundance of ocean data has been gathered since the year 2000, the ocean remains under-sampled. In many instances, there is still a scarcity of data at any one location and time. However, the rise of small, and efficient microcontrollers and single-board computers has catalyzed the development of low-cost, open-source, “do-it-yourself” ocean observing technologies. Combined with advances in data science, signal processing and machine learning, there is a real opportunity to move beyond traditional and expensive oceanographic instruments and start reimagining new and existing data streams that produce “good enough data” that could help us be better stewards of the ocean. I will present new optical imaging, passive acoustic and biologging tools that can be used to learn more about animal biodiversity, communication, and movement in our changing ocean. I will show how these interdisciplinary hardware and software tools have led to new insights about biodiversity patterns, animal distributions and physical-biological interactions at ecologically-relevant scales and can also be used to inform the sustainable management of natural resources and conservation. Deploying these tools at scale will also encourage a more inclusive and participative approach to ocean science, help us better predict ocean phenomena, and democratize access to the ocean.

Dr. Pagniello is a candidate for an open ORE faculty position in Oceanographic Engineering