

# NISHIDA LAB.

## [Ocean Nanosensing]

Department of Mechanical and Biofunctional Systems

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Ocean Nanosensing

Department of Systems Innovation

## Underwater Nano World

### *In-situ* Underwater Atomic Force Microscopy

#### ◆ Research Purpose

In ocean, there are various small pelagic resources, which are important environmental elements of the earth. For example, the micrometer-sized phytoplankton play significant roles in the ocean carbon cycle. Our research purpose is to observe and analyze the underwater small samples *in-situ* with nanometer resolution, for revealing new findings of the nature of ocean.

#### ◆ Research Subject

We are developing a novel *in-situ* underwater Atomic Force Microscopy (AFM) system, which is mountable on underwater vehicles. The system is composed of three technological elements as follows:

- Underwater AFM: Miniaturization, Weight saving, Water pressure resistance
- Microfluidic devices: Underwater sampling, Environmental control
- Underwater vehicles: Mount mechanisms

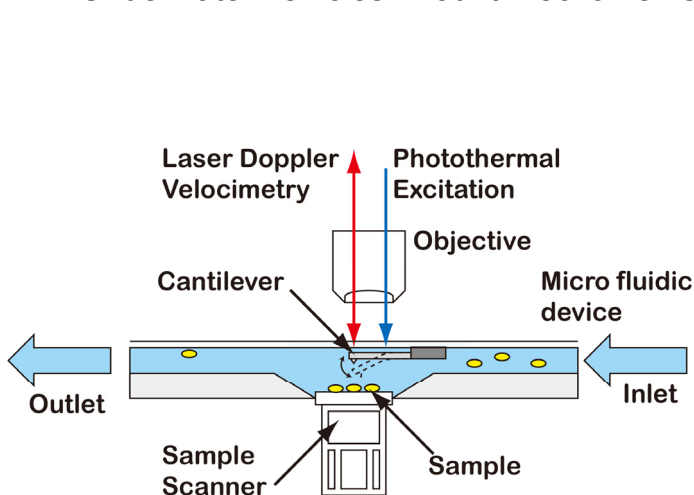


Fig. 1. Underwater AFM

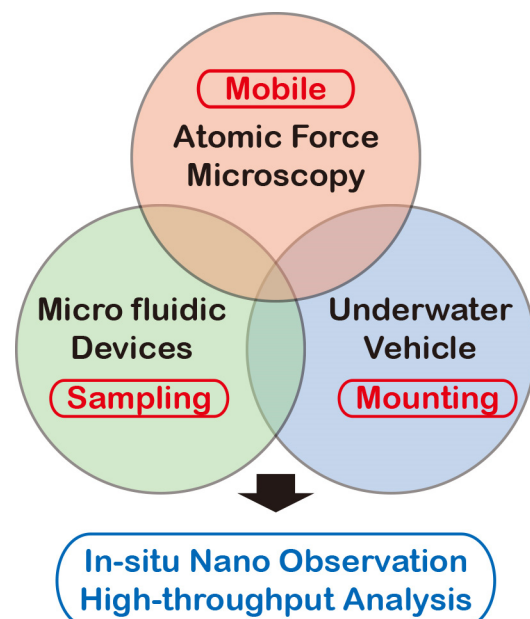


Fig. 2. Concept of *in-situ* underwater AFM system